Chas. F. Hoebner,
New York City

Jany. 1884

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS

AND

COLLATERAL INFORMATION.

VOLUME I.—1882 and 1883.

BY

EDWARD R. SQUIBB, M. D.
EDWARD H. SQUIBB, S. B., M. D.
CHARLES F. SQUIBB, A. B.

BROOKLYN, N. Y.
1883.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS, AND COLLATERAL INFORMATION.

VOL. I. JANUARY, 1882. No. 1.

ANNOUNCEMENT.

An apology may be due those to whom this pamphlet is sent, for even this very feeble attempt at starting a new journal, when the field of journalism is already so well filled. But a promise is made to the readers that if this new journal—undertaken with much hesitation and diffidence—should prove at any time to have no reason to be, it shall at once cease. As being a mere ephemeral waif, it will be sent gratuitously to all. No subscribers are solicited nor any subscription list kept, nor are exchanges with other journals asked for. It may be issued bi-monthly, or quarterly, or irregularly, or not at all, as the occupations of an otherwise very busy life may determine; and its chief object is, in an informal way, to note down, from time to time, the results of a long experience and observation and the deductions therefrom, together with occasional original work, as time and opportunity may serve. The contents should be accepted, if at all, as information—not as knowledge;—as material which may be of value only for the moment, or may mature and come to be added to the common stock of knowledge. Ephemerides are things of short life—for a definite or indefinite period, or for the time being,—yet they may not be valueless nor be unimportant as elements in the growth of permanent knowledge. Indeed, they must, in their aggregate, bear an elementary relation to more permanent knowledge. An ephemeris of the materia medica, pharmacy and therapeutics seems to be a very pretentious, ostentatious title, but the subjects are so inseparably related as to form really but one intelligent idea, and that one still incomplete at both extremities.

When such a collective subject has been the business of one lifetime, and becomes the expectancy of two other commencing lives educated with special reference to the subject, it does not seem irrational to hope that information may be given which may be interesting and useful to the medical and pharmaceutical professions, since the subject is the very foundation upon which the utility of these professions to mankind depends. The younger associates in this undertaking may, perhaps, at first do but little of the writing, but they will do much of the work upon which the writing is to be based.

To the professions of Medicine and Pharmacy, then, whatever may be here offered is respectfully dedicated by the writer and his two sons.

EDWARD R. SQUIBB.

BROOKLYN, January, 1882.

THE STRENGTH OF OPIUM AND THE NEW PHARMACOPŒIA.

When, in 1848, a law was passed by Congress "To prevent the importation of adulterated and spurious drugs and medicines," a careful examination of authorities seems to have been made in order to fix upon a strength below which Opium should not be admitted into the country, and this minimum strength was fixed at 9 per cent. of pure morphia. From that time to the present, this 9 per cent. has been the rule of downward limit for all the United States Custom House examiners, and Opium below that strength has never been lawfully admitted to entry in any Custom House of this country. As the loss of water in drying commercial Opium varies between 17 and 23 per cent., the average loss falls at about 20 per cent., and this is proved to be true by a large experience with the better grades of the drug. Hence Opiums which in the moist chemical condition yield 9 per cent. of pure morphia, when dried and powdered would give 11.25 per cent. pure morphia.

The Pharmacopœia of 1850 is silent upon the strength of its Opium; but that of 1860 prescribes that the officinal Opium shall not contain less than 7 per cent. of morphia. This was a curious mistake to make by so high an authority, for if no Opium could lawfully get into the country which contained less than 9 per cent., it had the inferential force of an invitation to unlawful importations.

The Pharmacopœia of 1870 defines that Opium, when dried at 212° F., until it ceases to lose weight, should contain at least 10 per cent. of morphia. This was an improvement in degree on the ruling of 1860, but it was still behind the lawful standard by 1.25 per cent. Now it becomes very important to see what the Pharmacopœia of 1880 will do, since the proposed law of Congress to prevent the adulteration of food and medicine, which, when passed, will become the general model for State laws, makes the Pharmacopœia the only standard. This will then take the place of the present Custom House law, and as all Opium must pass through the Custom House, the law which applies there will be of primary importance. If the Pharmacopœia standard should remain as at present, and the general adulteration law be passed affirming the Pharmacopœia as its standard for all medicines which it contains, then the Custom House examiners will have to abandon their 9 per cent. standard and fall back to 8 per cent. As the average unadulterated Opium of the past thirty years has not fallen off in strength, but, on the contrary, many of the inferior grades of thirty years ago, such as Constantinople Opium, for example, have so improved, that now they are among the finest Opiums, this would be a serious misfortune to the true interests of medicine in this important article. Standard authorities with much unanimity give the medium dose of Opium as 1 grain = ·065 gramme, and a corresponding dose of salts of morphia as about ·2 grain = ·013 gramme. The salts of morphia in common use, the sulphate for example, contain about 80 per cent. of pure morphia. This makes the medium dose of pure morphia,—equivalent to two-tenths of a grain of sulphate,—·16 grain = ·0104 gramme. Now if the medium dose of Opium and the medium dose of morphia be compared in equivalence, that is, if one grain of Opium produces about the same effect as ·16 grain of morphia, then the Opium must contain about 16 per cent. of morphia. It is highly probable, then, from this and from other considerations of past therapeutical experience, that the authorities who have compiled the therapeutic standards of doses from actual recorded experience have based their statement of dose upon Opium of 16 per cent. strength. It is true that these same authorities give the average percentage strength of good Opium as about 12 to 13 per cent.; but the processes of assay to which these refer are all faulty, and have been so much improved of late years, that it becomes almost certain the older processes failed to give account of all the contained morphia. Hence it may be regarded as extremely probable that the Opium upon which the therapeutic experience of the past based the medium dose was an Opium which really contained 16 per cent. of pure morphia, or within say 1 per cent. of this on either side of this number—that is, 14 to 17 per cent. Then it follows that if the new Pharmacopœia should adopt a standardized powdered Opium, which would represent the recorded therapeutic uses and doses of the drug, it should contain 14 to 17 per cent. of morphia.

In an effort to find out what strength of Opium was supplied to the markets as a medicinal agent, the writer has collected the assays of 8 lots of moist commercial Opium, all of the crop of 1879 and 1880. These 8 lots comprise 191 cases, and the lots were severally 10, 10, 7, 5, 10, 50, 29 and 70 cases. The minimum yield was 9.6 per cent. and the maximum 11.1 per cent., and the average was 10.25 per cent., for the 191 cases. This being all old Opium, would give a minimum loss in drying and powdering for medicinal uses. Say that it would lose the minimum of 17 per cent., then the powdered Opium from this would contain 12.35 per cent. of pure morphia. But much, if not all of this Opium, was below the average market grade for medicinal uses, and was sold at low prices to makers of morphia salts. None of it, or at least very little of it, would have brought the current prices of prime Smyrna Opium, and some was so poor-looking that it would not have been sold at all without being previously assayed. Leaving out the poorest lot of 50 cases, which contained 9.6 per cent. of morphia, the average would be 10.5 per cent., or, if dried and powdered, the 141 cases would average not less than 12.65 per cent. And the 50 cases of 9.6 per cent. Opium, taken alone, would yield a powdered Opium of 11.6 per cent. morphia strength.

When Opium is objected to on account of its poor appearance, either in the New York market or the Custom House, the writer occasionally serves as referee. Two lots, one of 28 cases, and the other of 7 cases, gave an average for the 35 cases of 10.3 per cent., equal to 12.8 per cent. if dried and powdered. Another lot of 3 cases, very old and dry, gave an average of 12 per cent., equal to 14 per cent. if dried and powdered. Another lot of one case gave 12.7 per cent., equal to 15 per cent., if dried and powdered.

This aggregate of 230 cases of Opium fairly represents the worst Opium that is knowingly admitted into this country under the operation of the present law, which says no Opium shall come in which has less than 9 per cent. of pure morphia, and the average of the whole 230 cases is 10.29 per cent., equal to 12.45 per cent. if dried and powdered.

It was next very desirable to know the morphia strength of the better or ordinary grades of Opium, or that which is generally supplied to dispensing pharmacists, and which thus comes more within the scope of the Pharmacopœia. First the writer, and then an unknown messenger bought "a quarter of a pound of the best powdered Opium for dispensing," from eight of the largest wholesale drug houses of Philadelphia and New York, if not the largest in the country. These eight firms probably supply the powdered Opium for prescription use and for preparations of Opium, to 75 or 80 per cent. of the pharmacists of New York, Brooklyn, Jersey City and neighboring towns and villages, or over two millions of population, to say nothing of their distributing business all over the United States. These eight samples were carefully assayed by a process, to be given hereafter, and yielded, respectively, 15.1, 14.5, 14.4, 14 3, 14.0, 13.9, 12.5 and 9.5 per cent. of pure morphia. The last sample, the 9.5 per cent., was badly adulterated with dextrine or some form of gum. And next to the last, or the 12.5 per cent., bore the label and seal of Merck, of Darmstadt. This sample also seemed to have some gummy admixture which rendered the assay process difficult and tedious; but the proportion was not larger than would be necessary to standardize a richer Opium, and it is presumed from the high character of this manufacturer that he sells a standardized powdered Opium of uniform strength. The last, 9.5 per cent. sample, had much the same appearance as that of Merck, and differed from all the others, so that it is not improbable that it was imported in powder.

As the firms who dispensed these last two samples do a much smaller business than any of the others, and as the samples are exceptional, they might be left out. But as the original design was to take the whole eight houses, they are retained in the average. This average is 13.52 per cent. of pure morphia. The writer himself supplies a considerable quantity of powdered Opium, which, if added, would not reduce the average, but which is excluded from consideration in this paper. It may be, therefore, pretty fairly represented that the powdered Opium of this market is uniformly of the same grade or kind, and that that grade does not vary more than 1 per cent. between the extremes of morphia strength, and that that strength is not far from 14 per cent. Calculating this 14 per cent. powder back to the moist condition, it indicates for the moist commercial drug as imported, a morphia strength of 11.2 per cent. for this grade of Opium, or about ·9 per cent. higher than the average of the 230 cases of lower grade as given above, and all are well within the 9 per cent. minimum limit set by law, and the whole result is an excellent illustration of the advantages of the law, and also of the inutility of the Pharmacopœia setting a standard which is below the law, as it did both in 1860 and 1870, but which it should never again do. If the Pharmacopœia should still adhere to its low minimum, and if the law now before Congress should pass, making the Pharmacopœia its standard, this will repeal the present law, which has served so well, and will reduce the minimum to 8 per cent. instead of 9 per cent., and will place the Pharmacopœia in the undesirable position of leading downward instead of upward. Should the Pharmacopœia for 1880 adhere to the present minimum of 8 per cent. = 10 per cent. for dried Opium, and should the bill to prevent adulterations, now before Congress, become a law, and thus repeal the present 9 per cent. law; and should the new Pharmacopœia adopt a standardized Opium with a standard so low as 10 per cent., it would not only materially disturb, but would revolutionize, the preparations of Opium. The medium dose of the tincture and deodorized tincture equal to a grain of Opium is 13 minims or 25 drops; but should these preparations be made from powdered Opium of ten per cent., this dose will be equivalent to only ·11 grain of morphia, when, as above shown, the stated medium dose for the morphia in morphia salt is ·16 grains, or nearly 50 per cent. more. But when these tinctures are made from the average of powdered Opiums now being supplied in the market—namely, 13.5 per cent. —their medium dose becomes ·14 grain of morphia, or much more nearly equal to the authoritative dose of the morphia salts. If a powdered Opium of 14 to 14.5 per cent. be taken for these preparations, then the authoritative doses of the tinctures and of the salts of morphia approach still closer to their proper equivalency, though the morphia in the dose of tincture is still only ·141 against ·16. But as the other sedative alkaloids of the tinctures must be taken into account, the total sedative and anodyne effect may be estimated as high as ·15 against ·16. It seems plainly deducible from these considerations that the strength of powdered Opium upon which the doses of the preparations are based and adjusted is about 15 per cent., and such Opium can always be had in the general market. And not only that, but such powdered Opium is now very generally supplied, so that these tinctures containing ·15 grain of morphia to the medium dose are now in very general use, and the current therapeutic practice and experience must be largely based upon this strength. A powdered Opium of 10 per cent., if thoroughly exhausted, gives tinctures containing 3.75 grains of morphia in each fluidounce. An Opium 14.5 to 15 per cent. gives tinctures of 5.5 grains in the fluid ounce. But in the officinal processes for these tinctures, the Opium is never quite exhausted. There is a tradition, without much authority, that laudanum should contain 4 grains of pure morphia in each fluidounce, and that is probably a good standard for laudanum that is sold for popular uses, as contradistinguished from the officinal tinctures dispensed in prescription use, yet there are great objections to having two strengths for synonymous names. In trying to solve this problem of the proper morphia strength for preparations of Opium, some twenty-two years ago, when the Pharmacopœia was silent on the subject, therapeutic experience in the equivalent doses led the writer to adopt the traditional strength of 15 to 17 per cent. for powdered Opium and 4 grains of pure morphia to the fluidounce for the liquid preparations made by him, and these latter preparations have always been made by assay, and were, therefore, always independent of the strength of Opium from which they were made. But it appears now, from more recent and more accurate knowledge on the subject, that they should be much stronger.

From these and other inferior considerations, this writer would recommend for the new Pharmacopœia, that Opium, in its moist commercial condition, be limited to contain not less than 9 per cent., nor more than 15 per cent. of morphia by the officinal process of assay. Prof. Flückiger is of the opinion that the German Pharmacopœia should demand 10 per cent., and quotes the assays of G. della Sudda in support of his judgment.

This, in its minimum limit, would conform to and continue the present Drug Law, which has answered so well and has become so well established that it has left the lower limitations of past revisions of the Pharmacopœia without force and inoperative. For even the implied invitation to reduce the strength of imported Opiums to the officinal minimum has had no general effect.

Next, he would recommend the introduction of a new heading, and to the Pharmacopœia a new article, namely, Powdered Opium, and limit this to contain not less than 14, nor more than 18 per cent. of pure morphia by the officinal process of assay.

Few, if any, pharmacists powder their own Opium, but nearly all buy it in powder, and all know where to get good Powdered Opium or poor, in accordance with their conscientiousness in their business. And whilst pharmacists should powder many, if not most, of their important medicinal drugs, Opium is an exception, because they would buy only a lump or two at a time, and these lumps vary so much in morphia strength that they could rarely get uniform results. Good powdered Opium can only be made by powdering an entire case or more at once. Then, if the pharmacist be authorized to buy his powdered Opium, and be supplied with a limit of strength within which to buy it, the assaying process will be put upon the wholesale dealer, who will assay a sample of each case as powdered, and from good houses the assay would soon appear upon the label of each bottle. Naturally, and in accordance with present established practice with good houses, as above shown, the morphia strength of the powders sold would be about 14 per cent., and would not exceed 15, and either of these strengths would be entirely proper for all the preparations of the Pharmacopœia. These preparations should also be limited in strength, so that when a stronger Opium was obtained less of it should be taken. The stronger Opiums are always cheaper than the weaker ones, and thus an inducement would be offered in this direction. In buying the samples of powdered Opium for the assays of this paper, the prices varied between $5.50 and $8 per pound. Taking the average percentage of morphia yielded by them, namely, 13.5 per cent., and dividing it into the average price paid, namely, $6.44 per pound, the cost of each per cent. of morphia is 47.7 cents—say 48 cents. Now, if a powdered Opium of 13.5 per cent. costs $6.44 per lb., a 15 per cent. Opium would be cheaper at any price less than (6.44+72=) $7.16, while a 17 per cent. powdered Opium would, upon the same basis, be worth $8.12. The higher grades of moist Opium which are imported into this market, such as Boghaditch, Yerli, Salonica, etc., are usually sold at perhaps 50 cents to $1 more per pound than the ordinary grades of prime Smyrna Opium. Yet they yield a powder which rarely falls below 16.5 per cent. and occasionally reaches 18 per cent. Hence the wholesale dealers who should buy these grades for powdering, and sell their powder by assay, would more than double their profits at relative morphia cost prices. If the Pharmacopœia should lead in such a direction, these considerations would soon come into practical effect.

The chief objections to an arbitrary standardized Opium, apart from the great difficulty of deciding upon an arbitrary standard, is first to know who is to standardize it. To be done effectively the wholesale dealer would have to do it, or the manufacturer of pharmaceutical preparations. And unless there was a good profit in it they would not be likely to do it, but would much prefer to sell assayed powder. If the manufacturer or wholesale dealer did it how would it be done? Often well done, but, perhaps, sometimes badly. And if badly done it would be difficult to detect. It is not difficult to make an assay of powdered or moist Opium in its natural condition, but when skillfully adulterated the assay becomes very much more difficult. The most convenient and most commonly used adulterants of powdered Opium are the different starches and gums, and these very much complicate and delay all the processes of assay. Standardizing Opium at once hands it over into the domain of adulteration, and it would be very difficult to tell whether any given sample was standardized or simply adulterated, and it would be an excellent defense to set up in a prosecution by Boards of Health that this important article was not adulterated but only standardized. It is true the Pharmacopœia might,—as it should,—direct that the diluent used should be a definite inorganic substance which could be readily determined, and which would not interfere with the processes of assay. Still it is a very dangerous step for the Pharmacopœia to take to introduce a practice of dilution and admixture, for it would have all the force of legalized adulteration. In the judgment of this writer these considerations far overbalance the great advantages that would accrue from having a strictly uniform strength for powdered Opium. The accuracy of therapeutic practice is the main argument for such uniformity, and it is a very strong argument. But when it is considered that the dose of an opiate varies so much from idiosyncracy, and from the varying conditions to which the dose must be adjusted, the argument loses much of its force, especially in view of the probability that an assayed powder would be sufficiently effective in securing practical uniformity. If patients and their conditions in their reactions with Opium were like chemicals in their reactions, then a very definite strength would be necessary. But, unfortunately, this is not the case.

The least objectionable method of having an arbitrary standard would be to place it so high that the ordinary grades of Opium would not reach it. Then the pulping of a portion of the Opium and straining out a proper proportion of the insoluble inert residue would be necessary. The chief objection to this would be the heating necessary to evaporate the solution and washings, as such heating always injures the alkaloid.

A matter of very great importance to the new Pharmacopœia is to get a good process for the assaying of Opium, and it is a prominent part of the objects of this paper to offer one which, with a very little practice, will be found moderately accurate, and as simple, convenient and easy as the moderate degree of its accuracy will admit. Many processes of assay have been published, some original, and others made up from the best points of preceding ones, but all have left something still wanting, and the general defect of all has been that they do not get all the morphia which the Opium contains. During many years the writer has used a modification of the Staples process with general success; but there are many points of uncertainty in the process, and a good deal of skill and experience are necessary to know when its results are trustworthy and when they need repetition; but with due care and repetition the results are moderately and practically trustworthy. Nevertheless, all the published processes have been fairly tried as they were proposed, and none so satisfactory have been found until within the past two years. The process of Mohr, by lime as a solvent and ammonium chloride as a precipitant, when modified by the use of alcohol and ether in the precipitation, is a very good process, but the frothy mixture is uncleanly, and often very difficult to exhaust,—the proportion of ammonium chloride is insufficient, and even when increased is not so good a precipitant as free ammonia, and hence it is probably that the results are always too low. It has always been suspected, too, though never proven, that the solution of calcium chloride held a larger proportion of the morphia from crystallizing out than in other processes where this salt is not present. Doubtless, in all practicable processes some morphia is held in a condition not to be accounted for, and it is very desirable to reduce this proportion to a minimum. For the purposes of the Pharmacopœia the lime process is objectionable, because it does not so well apply to the liquid preparations as other processes. Some two years or more ago (date lost by not being put upon the translation which the writer had made), Professor F. A. Flückiger, of Strassburg, published a most excellent and elaborate paper on the assaying of Opium, which is the best contribution to the subject made for many years. It is not entirely fair to the author to give a translation of a part of his paper when the whole is so necessary to the subject, especially when the translation, too, is of unknown degree of accuracy;* but the paper is a long one, and the writer hopes his friend may excuse him for the mutilation of his valuable work. After stating the difficulties of exhausting the Opium, Prof. F. goes on to say:

* This writer does not read German, and when Prof. Flückiger's paper appeared, the writer had it translated by some person now unknown who proved to be not a good translator, though perhaps not inaccurate.

It is therefore quite expedient, from our point of view, not to attempt a more or less complete exhaustion of the Opium, nor to have recourse to pressing out, but in accordance with an analytical proceeding used sometimes, to employ only one part of the watery extract for the determination of the amount of morphia. If one shakes the Opium with a suitable amount of water, and gains by filtration, for instance, half of the same, then half of the morphia passed over into the water must be contained in the filtrate. The objection against this may be obviated when one considers that 60 per cent. of the Opium is dissolved. Then one must add to the weight of the filtrate to be drawn off 30 per cent. of the weight of the Opium powder operated on, and then it will contain one half the morphia. To be precise, it would be necessary, in every particular instance, to find out how much the water contained by the opium weighs.

The quantity of Opium powder to be taken for quantitative determination is best limited to 8 grammes. The 8 grammes with 80 grammes of water are put in a closed bottle and left, with frequent shaking, during half a day, and are then brought upon a many-folded filter 125 m.m. in diameter. Under ordinary circumstances, from 65 to 68 c.c. run through. It appears to be immaterial whether, by employing a water air-pump, a larger quantity be obtained. 48.52 of the ingredients of the Opium are to be considered as dissolved. 42.5 grammes of the filtrate contains the morphia from 4 grammes of the Opium powder. One puts the 42.5 grammes of Opium extract into a small tared flask of about 100 c.c capacity. Then one weighs into the flask 12 grammes of alcohol of ·815 sp. gr., with 10 grammes of ether; that is, the solution of Opium receives an addition of one-quarter its volume of alcohol and one-third of ether, and is not clouded. Finally, one adds to the brown mixture 1.5 gramme of ammonia of sp. gr., of ·960, over which, after shaking, a colorless stratum of ether is formed. The ether is indispensable. It keeps the narcotine, which may have passed over with the water, in solution. The chief advantage, however, of the ether, is that the morphia crystallizes completely, and in a very pure condition from the solution of diluted alcohol saturated with ether. The flask, well corked, is placed quietly aside; after an hour it shows the first traces of crystallization at the surface of contact between the two strata. After standing twelve hours the crystallization will be complete, and will consist of a considerable quantity of slightly yellowish or brownish crystals. To make certain, one may allow it to stand twelve hours longer without detriment. Then one folds two filters of 10 c.m. in diameter in the shape of a star, places them together in a capacious funnel, and moistens them with alcohol and ether, which are mixed in the proportions mentioned above. Now you shake the morphia thoroughly with the mother liquor, bring it on the filter, and cover the funnel with a glass cover. After the liquid has passed through, you rinse the flask little by little with about 10 grammes of alcohol and ether, and finally with as much ether, without paying any attention to the morphia sticking to the glass. You take the filters from the funnel, allow them to dry in the air, and put the crystals of morphia, which are easily detached, back into the tared flask, which is dried at a temperature of 100°, and then weighed. It now contains all the morphia that was separated in the form of a hydrate of the formula $C_{17}, H_{19}, NO_3 + H_2O$, with 5.94 per cent of water. The fluid flows rapidly down through the star filter, and the considerable mass of paper and the use of the double filter, and takes up under cautious pressure the remnant of the mother liquor from the crystals. It is, therefore, more advisable not to weigh the filters.

The filtrate is then mixed with 5 c.c of ammonia, corked, and observed again a day after, in order to obtain a certainty that no more morphia crystallizes out. If you allow the mixture to remain standing in an open glass, those above mentioned amorphous flakes will separate.

42.5 grammes of the filtrate treated in the above mentioned manner gave me from ·405-·433 of morphia. It is a good plan to use the rest of the filtrate as a check assay, or to use 63.75 grammes in place of 42.5 grammes.

At the same time one may render acid a few c.c. of the filtrate with hydrochloric acid, shake them with a double volume of ether, allow this to evaporate, and treat the residue with a few grammes of water. Then these will contain enough of meconic acid to present, after the addition of iron chloride, the blood-red coloration. This reaction of meconic acid is concealed in the unaltered Opium extract by the presence of the morphia, and may, therefore, be adduced in this manner as characteristic of the Opium.

The criticisms which this writer diffidently makes upon this excellent process are as follows:

If the writer's opinion be accepted that an Opium assay which accounts for the morphia contained within 0.25 per cent. is sufficiently accurate for present pharmacopœial purposes, and for all practical purposes, then the exhaustion of all ordinary unadulterated Opiums to a practically useful extent is not difficult. The writer has exhausted two portions of 10 grammes, each of the same rich powdered Opium, by a way to be described—the one was exhausted to 225 cubic centimetres of solution, and the other to 150 cubic centimetres. The solutions yielded, under the same conditions of assay, practically the same amount of morphia. The use of an aliquot part of a given solution to represent an aliquot part of a partially soluble substance, dissolved and suspended in it, was proposed many years ago for Opium and cinchona barks, by P. Carles, probably, and was then tried by the writer without success. The discarded portion always contained proportionately more of the active elements than the portion taken. Nevertheless, when again recommended by an authority so high, who knew what had been done by his predecessors, the subject was well worth re-examination, and it was carefully tried by the writer, critically by the directions given, Opium of known morphia strength being used, check assays being made, and one portion being totally exhausted for another check. The first portion of the solution gave ·544 gramme of morphia. The discarded portion gave ·595 gramme of morphia, and the two added together did not account for the morphia known to be present in the Opium by about 1 per cent. The total being too low, was, however, shown by a check assay to be due to another cause, namely, the large volume of solution used for precipitation. Prof. Flückiger uses 42.5 grammes of solution, representing 4 grammes of Opium, for precipitation; but if this solution be evaporated on a water bath to about 10 cubic centimetres, and 6 cubic centimetres of alcohol and 12 cubic centimetres of ether be added, considerably more morphia will crystallize out with the same quantity of ammonia. The addition of alcohol, before precipitation, is essential and common to many processes. But the addition of ether, which, so far as the writer knows, is peculiar to Prof. Flückiger, is a very great additional advantage to the process ; and the proportion of ether recommended can be increased with additional advantage. The watery extract and the alcohol should be shaken together before the ether is added in order that a combination may be made. Then, after the ether is added, the mixture should be again shaken before the ammonia is added. The quantity of ammonia recommended seems excessive, but it is essential to the success of the process, and should even be exceeded a little, especially for Opium rich in morphia. Instead of setting the flask aside to crystallize, it is much better and gives a cleaner morphia to shake the flask vigorously until the crystals separate. With shaking, this always occurs in from 5 to 10 minutes, and if the shaking was continued for half an hour, the crystallization would probably be complete. But this has not yet been proved by check assays. In pouring the mixture onto a filter wetted with a mixture of ether and alcohol, as recommended, the filtration will often go on all right, but occasionally it is very slow and tedious, and the ethereal stratum on the surface will evaporate, precipitating the narcotine, etc., held in solution by it, to a greater or less degree, to be weighed as morphia. Therefore, it seems to be better practice to use a tared filter inside and an untared one outside—to wet these with ether, and then to carefully pour off the ethereal layer first into the filter with as little of the watery portion as practicable, and then to add a second portion of ether to the flask without shaking, and again pour off as much ether as practicable. And then, in order, this time, to get as much off as possible, a little of the dense watery solution may be allowed to pass into the filter with the last of the ether. Then, by covering the funnel and allowing the ether to pass through almost entirely before the watery solution is poured on, almost all the matters dissolved by the ether will be avoided. If the edges and sides of the filter be then washed down by about 5 cubic centimetres of ether before the dark, watery solution with the remainder of the ether is poured on, it will still further secure this result. When the watery solution has about half of it passed through, the flask should be rinsed out with water and the rinsings, with all the crystals, be poured onto the filter. If the shaking has been active while the crystals were forming this will leave the flask nearly clean. Anything in the interior of a flask is very difficult to dry, and from this reason such substances are often weighed when imperfectly dried. But by getting almost all the crystals onto the filter the inside of the flask is comparatively easy to dry, and there is less risk of weighing moist crystals. Then, as the filter drains the edges and sides and the crystals are washed down, with about 5 or 6 cubic centimetres of water, the water serving quite as well for these washings, etc., as the mixture recommended. When drained, the filter is closed together and lightly pressed between folds of bibulous paper, and then dried at 100°C. It is better not to put the crystals back into the flask to dry, but to dry and weigh them in the filter, and dry and weigh the flask separately. Then the morphia should be detached from the filter,and the filter be re-weighed this second weight being subtracted in getting the account of the morphia. The only use in taring and marking the filter before it is used is that the difference in the weight before and after it has been used serves as a good and useful indication of how well the crystals have been washed, because the increase of weight in the filter is from the quantity of ethereal solution which has dried in it. When it is very much heavier than it was before use, then the morphia also is a little heavier than it should be from some little of this solution having dried in it.

It seems somewhat pretentious to call these mere changes in detail a modification of the process of Prof. Flückiger, but they are by no means unimportant, and therefore the writer submits them under the following title, and claims that this is the best process yet offered. He may apologize for giving it in so much detail, but this is done advisedly, as the minutiæ are given in the hope that pharmacists who may be unaccustomed to such work may thus be induced to try it. While, if the Committee of Revision choose to adopt it, they can properly condense it, this pamphlet being always accessible as a process, with a running commentary, which this writer found so rare and yet so useful in his younger days.

OPIUM ASSAY.

Flückiger's Process Modified by E. R. Squibb.

Take of Opium in its commercial condition 10 grammes=154.32 grains.

If commercial powdered Opium is to be assayed for morphia, it should not be dried, but should be weighed for the assay in the condition in which it is found in the market, and in which it is to be dispensed.

If commercial moist opium is to be assayed for morphia, the taking of the sample for assay is a matter of great importance, because it is highly probable that, unless by accident, no two lumps of a case are of exactly the same morphia strength. Hence it is that assays of moist opium are at best only close approximations, though sufficient for practical purposes.

About every tenth lump of a case should be sampled by cutting out a cone-shaped piece from the middle of the lump, with an ordinary pocket knife. Then from the side of each cone, a small strip is taken from point to base, not exceeding say half a gramme from cones, which would average 10 to 15 grammes, and the cone is then returned to its place in the lump. The little strips are then worked into a homogeneous mass by the fingers, and the mass is then wrapped in tin-foil, moist cloth or paper, to prevent drying, until it can be weighed off for assay. When opened to be weighed off, it is best to weigh at once three portions of 10 grammes each. In one portion the moisture is determined by drying it on a tared capsule until it ceases to lose weight at 100° C.=212° F. Another portion is used for immediate assay, and the third is reserved for a check assay if desirable.

Put the weighed portion into a flask, or common wide-mouthed vial of 120 c.c.=4 fluidounces capacity, tared and fitted with a good cork. Add 100 c.c.=3.3 fluidounces of water,—distilled water by preference, but this is essential only when common water contains an unusual amount of inorganic matter,—and shake well. Allow it to macerate over night, or for about 12 hours, with occasional shaking, and then shake well and transfer the magma to a filter of about 10 centimetres=4 inches diameter, which has been placed in a funnel and well wetted. As it is the shaking which accomplishes the object here in view, rather than the standing, the time of maceration can be easily shortened even to three hours, if the shaking be frequent and active.

As rare exceptions, some powdered opiums will be found which through natural conditions give a magma with water which will not filter, or filter so very slowly that the water solvent becomes impracticable. When this is discovered, the magma is thrown away and a fresh portion of powder is taken. Wash this by agitation in the bottle with 30 c.c.=1 fluidounce of ether (s. g. ·728), transfer it to a filter, rinse the bottle with 20 c.c.=·66 fluidounce more ether, and pour this into the opium in the filter. When this has passed through, wash the filter and opium with 10 c.c.=·33 fluidounce more ether applied drop by drop around the edges of the filter and on the surface of the opium. Then dry the powder on the filter and use it as in the case of opium which does not need to be first washed with ether.

Opium which is adulterated, or standardized by admixture with dextrine, gums, sugar or glucosides, yields an impracticable magma with water, and ether washing to such does little or no good. All such samples have to be exhausted with an alcoholic solvent. If not much adulterated a mixture of equal measures of alcohol (s. g. ·820) and water will answer best, but generally a mixture of 2 measures of alcohol (s. g. ·820) with 1 measure of water is to be used, instead of water alone, for the exhaustion, and as this mixture is not as good a solvent for the morphia salts in the opium as water, more of it is required, and the washing and percolating should be carried to 250 c.c.=8.33 fluidounces of solution from the 10 grammes=54.132 grains of opium. The process after exhaustion is the same as where water is used as a solvent.

Filter off the solution into a tared or marked vessel and percolate the residue on the filter with water dropped onto the edges of the filter and the residue until the filtrate measures about 120 c.c.= 4 fluidounces, and set this strong solution aside. Then return the residue to the bottle by means of a very small spatula, without breaking or disturbing the filter in the funnel, add 30 c.c.= 1 fluidounce of water, shake well and return the magma to the filter. When drained rinse the bottle twice, each time with 10 c.c.=·33 fluidounce water, and pour the rinsings upon the residue. When this has passed through, wash the filter and residue with 20 c.c.=·66 fluidounce of water, applied drop by drop around the edges of the filter, and upon the contents. When the filter has drained there should be about 70 c.c.=2.33 fluidounces of the weaker solution. This (120+70=) 190 c.c.=6.33 fluidounces of total solution will practically exhaust almost any sample of 10 grammes=154.32 grains of Opium. But occasionally a particularly rich Opium, or one in coarse powder, or an originally moist Opium which has by slow drying become hard and flinty, will require further exhaustion. In all such cases, or cases of doubt, the residue should be again removed from the filter and shaken with 30 c.c.=1 fluidounce of water, and returned, and be again washed as before. The filter and residue are now to be dried until they cease to lose weight at 100° C.=212°F. If any residue remains in the bottle, the bottle is also to be dried in an inverted position and weighed. Evaporate the weaker solution in a tared capsule of about 200 c.c.=6.66 fluidounces capacity, without a stirrer, on a water-bath until reduced to about 20 grammes=309 grains. Now add the 120 c.c. of stronger solution, thereby subjecting this portion to the shortest practicable heating with least injury to the alkaloid—and evaporate the whole again to about 20 grammes=309 grains. Cool the capsule and contents, and when cool add 5 c.c.=·17 fluidounce of alcohol (s. g. ·820) and stir until a uniform solution is obtained, and no extract adhering undissolved on the capsule. If this solution should contain an appreciable precipitate, as from rare specimens of Opium it will, it must be filtered, and the filter be carefully washed through. Then the filtrate must be evaporated to 25 or 30 grammes. Pour the concentrated solution from the capsule into a tared flask of about 100 c.c.=3.33 fluidounces capacity, and rinse the capsule into the flask with about 5 c.c. of water used in successive portions. Then, if the solution has not required filtering, add 5 c c.=·17 fluidounce more of alcohol. If it has been filtered and evaporated add 10 c.c.=·33 fluidounce of alcohol and shake well. Then add 30 c.c.=1 fluidounce of ether, and again shake well.

This shaking together first of the watery solution and alcohol causes the alcohol to combine with the water before the ether is added. The ether then added, the second shaking saturates the watery solution and combined alcohol with ether, and then the mixture is ready for the precipitation of the alkaloid under the most favorable condition.

Add now 4 c.c.=·133 fluidounce of solution of ammonia, of 10 per cent. (s. g. ·960) and shake the flask vigorously until the crystals begin to separate. Then set the flask aside in a cool place for 12 hours, that the crystallization may be completed.

This shaking secures the crystallization in very small crystals, so as to be easily washed and not adherent to the flask. The crystals will then be found partly at the bottom of the flask and partly in the ether at the surface of the lower dark, watery solution. If the shaking be frequent and vigorous, two or three hours' time will be sufficient to complete the crystallization, or if it be continuous, half an hour would be sufficient, but as a general rule it is better to allow the flask to stand over night. When there is no haste, a very good method is to macerate the opium over one night—prepare the solution during the day, and allow the second night for completing the crystallization. Then finish the assay on the second day. If there be haste, however, the assay may be completed in one day by the vigorous and frequent shaking above indicated. Indeed, maceration without agitation or percolation is comparatively useless after the powder to be exhausted becomes completely saturated; and crystallization in a dense liquid like this is very slow if convection or liquid diffusion be depended upon; but agitation brings all parts of the liquid so thoroughly in intimate contact, that an half-hour's vigorous agitation must be fully equal to twelve hours' standing without agitation.

Pour off the ethereal stratum from the flask, as closely as possible, onto a tared filter of about 10 centimetres=4 inches in diameter, well wetted with ether. Add 20 c.c.=·66 fluidounce of ether to the contents of the flask, rinse round without shaking, and again pour off the ethereal stratum as closely as possible onto the filter, keeping the funnel covered. When the ethereal solution is nearly all through, wash down the edges and sides of the filter with 5 c.c. = ·17 fluidounce of ether, and allow the filter to drain with the cover off. Then pour on the remaining contents of the flask and cover the funnel. When the liquid has nearly all passed through, rinse the flask twice with 5 c.c. = ·17 fluidounce of water each time, pouring the rinsings with all the crystals that can be loosened onto the filter, and dry the flask in an inverted or horizontal position, and when thoroughly dry weigh it. Wash the filter and crystals with 10 c.c. = ·33 fluidounce of water applied drop by drop to the edges of the filter. When drained, remove the filter and contents from the funnel, close the edges of the filter together, and compress it gently between many folds of bibulous paper. Then dry it at at 100° C. = 212° F. and weigh it. Remove the crystals of morphia from the filter, brush it off and re-weigh it to get the tare to be subtracted. The remainder, added to the weight of the crystals in the flask, will give the total yield of morphia, in clean distinct small light-brown crystals.

Take a small portion of these crystals, rub them into very fine powder and weigh off ·1 gramme = 1.54 grains. Put this in a large test-tube fitted with a good cork and add 10 c.c. = ·33 fluidounce of officinal lime water. Shake occasionally, when the whole of the powder should dissolve. (Absence of narcotine,) (Flückiger).

In pouring off the ethereal stratum from the flask as closely as possible, a little of the dark liquid and crystals will pass in with it, but this is of no consequence. The second portion of ether is added to dilute the remainder of the first, so as to get as much of it as possible separated before the watery liquid is poured into the filter, because this first ether contains all the narcotine and oily matters of the solution, and as the ether evaporates off from these they are deposited in the filter and with the morphia, and would be weighed with it. During this ethereal filtration the funnel is kept closely covered to prevent this evaporation and precipitation, but after the edges have been washed down with fresh ether, and the whole has passed through, there is so little of it left with the watery portion, and that little is so diluted that the whole may be poured on together. In adding the last or diluting portion of ether to the flask it is a little better to shake the whole contents together vigorously, but then it becomes necessary to wait a half hour or more for a complete separation before the ether can be poured off well. In pouring off this second portion, in order to leave as little ether as possible in the flask, it must be done very slowly, and toward the last, in order to get it close, a cubic centimetre or two of the dark liquid will pass out with it, but this is of no consequence, as it does not interfere with the ether filtration. The ether-wet filter does not filter the watery solution rapidly, and with some opiums very slowly, indeed. And when this occurs the crystals are always darker and more likely to contain narcotine. When the filtration is so slow as to be impracticable, another assay must be made up to the point of the filtration. Then the filter must be wetted with water instead of ether, and the dark watery solution be filtered first. This is easily done by covering the mouth of the flask with the end of the finger and slowly inverting the flask. The dark liquid will then occupy the neck and can be let out slowly onto the filter to the last drop, leaving the whole ethereal liquid in the flask. The operator should be careful that no crystals remain on his finger. When the dark liquid has all passed through, the filter should be well washed with about 10 c.c. of water, and be dried. Then the ethereal liquid and the remainder of the crystals should be poured on, and the flask be well rinsed with ether and the rinsings be poured on the filter with as many of the loose crystals as possible The filter should next be washed down with 5 c.c. of ether, and be again dried. Then the flask should be rinsed out twice with 5 c.c of water each time and the rinsings poured onto the filter, and the sides be finally washed down with water. It is very difficult to dry a substance completely in a flask if there be enough of the substance to form more than one thin layer of particles at any point, and, therefore, as few crystals as possible should be left in the flask. Usually, with good management, the quantity is only a few milligrammes. The nearer to an inverted position that a flask can be placed without closing its mouth too much, the more quickly it will dry, because the heavier, moisture-charged air can then continuously run out and be replaced with dryer air. If the flask be not rinsed out with water last, a weighable quantity of ether residue will remain in it with the small quantity of morphia. After the filter has drained in the funnel, it will still contain a very considerable amount of liquid holding soluble matters which should not be dried with the morphia, hence the necessity of removing it from the funnel, folding its edges together as it was before it was opened, and placing it between folds of bibulous paper. If a light weight be laid upon the folds of paper and the filter, to keep a little pressure upon them, the paper will draw out as much of the washings as it can hold, and thus not only remove accidental matters in solution, but greatly facilitate the drying in a short time. The taring of the filter before using is not important, but is very useful as an indication of how well the filter and contents may have been washed, for the difference in tare before and after use shows how much weighable matter has been left in the paper when the water was evaporated off, and by inference how much was left in the morphia, though the amount in the morphia is of course much smaller than in the paper. This difference in the weight of the filter before and after use, in fair average opiums, will not exceed 4 or 5 milligrammes, and should never exceed a centigramme. Adulterated and mixed opiums usually give greater differences and give darker crystals.

In the weight of the crystals obtained, the moving of the decimal point of the metric weight one figure to the right, of course gives the percentage of morphia.

This process, according to the skill and care with which it is managed, will give uniform results to within two or three-tenths of a per cent., and will give a true account of the morphia in all unadulterated opiums probably to within a quarter of one per cent. and the results are believed to be too low rather than too high. Adulterated opiums, however, are much more difficult to assay and yield crystals which are always darker and less clean, and therefore the results are almost always too high. Poor opiums, on the other hand, are very easy to assay, and usually give very light-colored clean morphia. The results here are liable to be too low, because when the quantity of morphia is small the alcohol and ammonia used are proportionately too large, so that much morphia may be retained in the mother liquor. Therefore, when the morphia comes out very white and in small proportion, the assay should always be repeated, evaporating the solution to 10 grammes instead of to 20, and adding 5 c.c. of alcohol instead of 10, and 2.5 or 3 c.c. of ammonia instead of 4.

The lime-water test for the narcotine in the results of the assay is quite sufficient, since nothing except coloring matter is so likely or so liable to be present as narcotine. The only difficulty is to know when the lime-water has surely dissolved all that it will dissolve. This is facilitated by having a very fine powder, and then good judgment is required to know the value or significance of undissolved residues when they are small.

The above process is very easily applicable to the assay of such preparations of Opium as the tincture, deodorized tincture and compound solution. For the assay of these:

Take of the liquid preparation 120 c.c.=4 fluidounces. Evaporate at a low temperature to 10 grammes=155 grains, and from this point proceed exactly as in the above process, using, however, 5 c.c. of alcohol instead of 10, and 2.5 to 3 c.c. of ammonia instead of 4.

This quantity of the liquid preparations is equal to about 150 grains, or a little less than 10 grammes of the opium from which they were made, if made by the officinal process. The yield of morphia should be not much less than 1 gramme=15.43 grains,=4 grains to the fluid ounce, nor more than 1.5 grammes=23.15 grains=5.8 grains to the fluidounce.

If the preparations were made by assay, and bear the assay value upon the label, then the yield of morphia should agree with the assay on the label within two or three-tenths of a grain to the fluidounce, or in proportion to the skill and success of the assay; but there will always be some loss.

Notwithstanding all the elaborate detail and repetitions with which the writer has, perhaps, overloaded this process, there are few who will be successful with it until after two or three trials; and the younger physicians and pharmacists upon whom must fall the responsibility of upholding the standards of the materia medica,—to whom these elaborate details are addressed,—should not be discouraged if very many trials be needed to render them expert enough to obtain tolerably accurate and uniform results.

THE ADULTERATION BILL BEFORE CONGRESS.

The Senate Bill, 47th Congress, 1st Session, S. 649, "To Prevent the Adulteration of Food or Drugs," introduced by Mr. Miller, of New York, December 20th, 1881, is now fairly before Congress and the public for consideration. This Bill is practically the same as those recently enacted by the Legislatures of New York and New Jersey; that is, being modeled upon the same plan, it contains the same advantages and defects. This Bill, when it becomes a law, will be likely to serve as a model for laws with similar objects in other States, and therefore it should be considered with great care and deliberation, and as many defects as practicable should be eliminated before it becomes a law. The Bill is as follows:

IN THE SENATE OF THE UNITED STATES.

DECEMBER 20, 1881.

MR. MILLER, of New York, asked and, by unanimous consent, obtained leave to bring the following bill; which was read twice and referred to the Committee on Commerce:

A BILL

TO PREVENT THE ADULTERATION OF FOOD OR DRUGS.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That no person or corporation shall knowingly transport, or cause to be transported, from the State, District or Territory in which he resides or does business, into any other State or Territory, or from any foreign country, or other State or Territory, into the State or Territory in which he resides or does business, for sale or barter, or to be offered for sale or barter, any article of food or drugs adulterated within the meaning of this act; and any person violating the above provision shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined not more than fifty dollars for each offence.

SECTION 2 That no person shall, within the District of Columbia, or in any of the Territories, or in any fort, arsenal, dock-yard or reservation, or other place under the jurisdiction of the United States, manufacture, offer for sale or sell any article of food or drugs which is adulterated within the meaning of this act; and any person violating this provision shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine not exceeding fifty dollars.

Sec. 3. That if, on examination of any article of food or drugs imported from any foreign country, it is found to be adulterated within the meaning of this act, a return to that effect shall be made upon the invoice, and articles so noted shall not be permitted to pass the Custom House or be delivered to the consignees, unless, on re-examination as provided for in this act, it shall be found that the said articles are not adulterated.

Sec. 4. That the owner or consignee shall have the privilege of calling, at his own expense, for a re-examination; and on depositing with the Collector of Customs such sum as he may deem sufficient to defray such expense, it shall be the duty of the Collector of Customs to procure a certificate, under oath, from a public analyst, of a careful analysis of the articles in question; and in case the report, by certificate, of the analyst shall declare the report of the officer who examined the goods to be erroneous, and the said articles to be unadulterated, the said articles shall be returned to the owner or consignee, and passed without reservation on payment of the duties, if any; but in case the officer's return shall be sustained by the analyst, the said articles shall remain in charge of the Collector of Customs, to be disposed of in accordance with regulations to be prepared by the National Board of Health and approved by the Secretary of the Treasury; *Provided*, That the owner or consignee, on payment of charges of storage and other expenses necessarily incurred by the United States, and on giving bond, with sureties satisfactory to the Collector, agreeing to remove said articles from the United States, shall have the privilege of re-exporting them at any time within the period of six months after the date of the report of the inspector or public analyst.

Sec. 5. That in order to carry into effect the provisions of this act the Secretary of the Treasury is hereby authorized to appoint, from names submitted to him for that purpose by the National Board of Health, one or more suitably qualified persons as special inspectors and as public analysts for adulterated food and drugs at such ports of entry as the Secretary of the Treasury may deem expedient; and it shall be the duty of the National Board of Health to prepare instructions governing the work of such inspectors and analysts, which, when approved by the Secretary of the Treasury, shall govern their action, and that of Collectors of Customs, in preventing importation from foreign countries of food or drugs adulterated within the meaning of this act.

Sec. 6. That the National Board of Health shall make, or cause to be made, examination of specimens of food and drugs collected under its direction in various parts of the country, and shall publish in its weekly bulletin the results of such analyses If it shall appear from such examination that any of the provisions of this act have been violated, the Secretary of the Board shall at once report the facts to the proper United States District Attorney, with a copy of the results of the analyses duly authenticated by the analyst under oath.

Sec. 7. That it shall be the duty of every District Attorney to whom the Secretary of the National Board of Health or any Collector of Customs shall report any violation of this act to cause proper proceedings to be commenced and prosecuted without delay for the fines and penalties in such case provided, unless, upon inquiry and examination, he shall decide that such proceedings cannot probably be sustained, in which case he shall report the facts to the National Board of Health. And for the expenses incurred and services rendered in all such cases the District Attorney shall receive and be paid from the Treasury such sums as the Secretary of the Treasury shall deem just and reasonable, upon the certificate of the Judge before whom such cases are tried or disposed.

SEC. 8. That an article shall be deemed to be adulterated within the meaning of this act—

a. In the case of drugs:

First.—If when sold under or by a name recognized in the United States Pharmacopœia it differs from the standard of strength, quality or purity laid down therein.

Second.—If when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on materia medica, it differs materially from the standard of strength, quality or purity laid down in such work.

Third.—If its strength or purity fall below the professed standard under which it is sold.

b. In the case of food or drink:

First.—If any substance or substances has or have been mixed with it so as to reduce or lower or injuriously affect its quality or strength.

Second.—If any inferior or cheaper substance or substances have been substituted wholly or in part for the article.

Third.—If any valuable constituent of the article has been wholly or in part abstracted.

Fourth.—If it be an imitation of or be sold under the name of another article.

Fifth.—If it consist wholly or in part of a diseased or decomposed, or putrid or rotten animal or vegetable substance, whether manufactured or not, or, in the case of milk, it is the produce of a diseased animal.

Sixth.—If it be colored or coated, or polished or powdered, whereby damage is concealed, or it is made to appear better than it really is, or of greater value.

Seventh.—If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of a person consuming it; *Provided*, That the National Board of Health may, with the approval of the Secretary of the Treasury, from time to time declare certain articles or preparations to be exempt from the provisions of this act; *And provided further*, That the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health, and that the articles are distinctly labeled as a mixture, stating the components of the mixture.

SEC. 9. That it shall be the duty of the National Board of Health to prepare and publish, from time to time, lists of the articles, mixtures or compounds declared to be exempt from the provisions of this act in accordance with the preceding section. The National Board of Health shall also, from time to time, fix the limits of variability, permissible in any article of food, drug or compound the standard of which is not established by any national pharmacopœia.

SEC. 10. That the term "food," as used in this act, shall include every article used for food or drink by man. The term "drug," as used in this act, shall include all medicines for internal or external use.

SEC. 11. That all the regulations and declarations of the National Board of Health made under this act from time to time, and promulgated, shall be printed in the Statutes at Large.

SEC. 12. That this act shall take effect ninety days after it shall have become a law.

Three prominent elements are easily recognized in the object of this Bill. First, to deter persons from practices of adulteration; second, to detect such practices; and third, to punish them. All these combine to prevent adulterations. But the first is by far the most important element, and that which requires greatest emphasis, because it is most radical in its influence and most economical in its effects. The motive power of all adulteration is pecuniary profit or gain, and not to endanger or damage health at all. And that adulterations do endanger health is a mere accident that most adulterators strive to avoid by rendering their adulterations as harmless as possible. Therefore it is that all adulterations are mere dilutions and substitutions in the interest of pecuniary profit or gain, and if they are ever positively hurtful it is by accident and not by design, and hence adulterations are simply frauds, cheats or deceptions to make money by, and they are studied out and designed in this one single interest before they are put in practice. Now, when a law can come in effectively between the motive and the act, to deter from the act, it is then nearly perfect, since there is nothing then to detect or punish, nor any work for the analysts or the courts at all, no expense to the Governments, and, therefore, no taxes upon the people for enforcing the law, to say nothing of the moral effects of restraining from vicious practices. A law which is to be operative between the motive or design and the act to be prevented should be so drawn as to be fully comprehended in all its force and bearings by the class who are to be restrained by its operation. It must, therefore, be drawn in full detail and in plain language, and in the natural order of the offence to its legal results. The act of adulteration must be not only plainly defined in general, but its various phases must be specially, carefully and even diffusely defined, so that each would-be adulterator can see his design clearly estopped by the letter of the law, and the penalty as clearly set opposite to the act. Then, if the penalty be sufficient, and sufficiently sure to make the risk of punishment greater than the profit will warrant, the design to adulterate will be abandoned, and the law will have had its natural and wholesome success. But this Senate Bill, like the two laws of New York and New Jersey, seems to miss the full value of these considerations; or, rather, in aiming to be concise, compact and brief, it becomes too general, and too loose for any very clear comprehension by the adulterator, to whom it is really addressed. It seems to address itself to the analysts, lawyers and courts, and its generalities leave too much room for protracted legal proceedings and technicalities—all of which involve well known chances of escape for defendants. Adulterators are, as a class, intelligent, skillful, cunning and rich, and their business training teaches them to weigh well all their risks and chances; and therefore, an energetic business man will assume the risks and chances of a doubtful because general law, when he would not take the risks of a special detailed clause or provision of a more special law. It is the business of such a class to consider, and take or refuse special risks, for that is the basis of all speculation. They may engage in undertakings which are generally doubtful, when they would decline such as have well defined special risks. The aim of these laws is to cause the over-shrewd business man, who is in a hurry to be rich, to think to himself before he acts, that "it will not pay to take the risks." If the law be loose, and its forces scattered and uncertain, he will try it, and if interfered with, his ability and wealth together will secure to him the very best legal ability in his defence. The success of all such laws, if well constructed and thoroughly applied, is measured—not by the frequency of prosecutions under them, but by the rate at which the offences disappear in the community, and the infrequency with which they appear in the courts.

Again, the Bill and the similar laws already enacted are not drawn in a natural order. A clear definition of the terms used, and of what constitutes the offence of adulteration in its various typical forms, should precede the mandatory and penal clauses, which are based upon the abstaining from or the committing of the offence. Common sense requires that an act shall be very clearly and fully explained or defined before it can be logically prohibited. The present order seems to address the law to the District Attorney and the courts rather than to the adulterator.

Again, the Bill seems to be incomplete in that it does not make adequate provision for its application. No legal provision for procuring or identifying samples, nor for examining them. All this, and much other necessary detail, is delegated to the National Board of Health. It is eminently wise that that Board should have charge of the law and apply it through the nomination of proper examiners, and the issuing of detailed instructions, but that Board should have a full and complete law to execute. It cannot make laws, and the courts will soon show that its action and instructions have not the force of law. It will soon have either to amend the law or obtain supplementary laws, and the experience of Great Britain shows how disastrous this is. It is not fair to impose duties on this important Board which will inevitably bring it into the courts without a standing. All the requirements for the full and entire machinery and application of the law should be fully embraced within the law, leaving the Board to be the executive body, with bases of well defined law for all its rules and rulings; for, even then, the Board will find the duties very complicated and very onerous. Any one who has followed the operation of the succession of British laws for many years past will see that the difficulties to be met by such laws are not easily overrated; and any law framed without taking advantage of the mistakes which have been already made must be liable to make similar ones. There is a great popular tendency to underrate the difficulties of all such laws. In the rapid advancement of other arts, that of successful adulteration has not been left behind. Most of the old methods are effete, and have been abandoned as clumsy and too easy of detection. No one in these days would think of adulterating sugar with sand or moisture. Grape sugar marks the progress of the times. Nor would any one think of adulterating rhubarb with turmeric or gamboge; but when good rhubarb is chiefly adulterated with bad, and good flour with bad, it will need a very good law, and one that is very perfect and explicit in every detail, to reach such skillful practices, either to deter from them or to detect and punish them. And no Board of Health, with so many other important duties, should have its force and usefulness weakened by imposing upon it the administration of a law which is either so weak or so imperfect as to fail to deter the adulterator or fail to convict him in the courts.

A few minor points in the detail of the proposed law are perhaps worthy of notice.

In the title, "To prevent the adulteration of food or drugs," the wrong conjunction is used. It should be food and drugs. But it is doubtful if the word "drug" is used advisedly. Drugs are used in the arts, and many drugs are not medicines, and many are used both in medicine and in the arts, though different degrees of purity are required for these different uses. Whilst most medicines are drugs, some are not drugs, but all drugs are not medicines. It is not doubtful that medicines are intended by the Bill, because in section 10 it is defined that "the term 'drug,' as used in this act, shall include all medicines for internal or external use." Then why not say, instead of "food or drugs," food and medicine? Then medicine should be defined in the Bill as follows: The term "medicine," for the purposes of this law, shall include every article other than food and drink that is used for the relief or cure of disease in man and animals, including antiseptics, disinfectants and cosmetics.

Then the proposed law says, "That no person or corporation shall knowingly transport." This word "knowingly" is objectionable. As it stands, the prosecution under the law must prove it, and all are aware how difficult it is to prove knowledge or intention of doing wrong or of breaking a law. Whilst, if the word be omitted, the defence may still prove that the transportation was unknowingly, if it be possible. The omission of the word places the necessity to prove where it should always rest, namely, with the defence, because cause for action is presumption of guilt. Again, a person's intention to sell or barter his goods, or to offer them "for sale or barter," may be difficult to prove. Possession or ownership of an adulterated article should be sufficient, or, at least, should be added to the "for sale or barter." Let the defence prove that the articles were for his own use, or for a manufacturing process, etc., as usually set up in such cases. This same having in possession any adulterated article needs to be introduced in other parts of the Bill.

In the provision for re-examination of imported articles at the owner's or consignee's expense, said articles having been condemned by a Government officer, it is quite unjust for the Government to select the analyst and make the owner pay the cost in the event of the officer being in error. The practice now prevailing, that the Government and owner together agree upon a skilled examiner or, if necessary, an analyst, is better, and then let the party in error pay the costs of the appeal.

In this section 4, analysts and analysis alone are provided for, when analysis is only possible in a very few of the cases which actually occur in the Custom Houses. For example, how can rhubarb or dandelion be analyzed? They cannot; but must be examined for adulteration as for quality, by the judgment and special knowledge of persons of experience in medicines.

Owners and consignees to have "the privilege of re-exporting" condemned articles is careless wording, although it is copied from the present drug law. It should, of course, be simply "exporting them at any time within," etc.

Section 6 imposes on the National Board of Health duties which will probably bring it into conflict with State authority and State Boards of Health, if not with the Constitution of the United States; and, if so, U. S. District Attorneys will hardly undertake to go into courts with such cases. But good lawyers like Senator Miller should know whether this be so or not.

In section 7, why should Collectors of Customs "report any violation of this act to cause proper proceedings to be commenced" by District Attorneys, when sections 3 and 4 have already provided for all such violations in a final way by handing the articles over to the National Board of Health or having them sent out of the country? By the way, when they are exported, it should only be back to the place whence they came, for obvious reasons, though the present drug law from which this is taken does not compel this.

In section 8, a drug must be "sold under or by a name," or be "below the professed standard under which it is sold," in order to come under the definition of adulteration, while in food and drink it does not require the substances to be sold, except in the fourth specification, in order to make them subject to the definition. Of course, the articles should be liable to the charge of adulteration wherever found, no matter whether sold or not sold. And if the proposed law means this, as doubtless it does, why make the distinction between medicines and food?

In the seventh specification of this section a substance, to be considered as adulterated, must contain "any ingredient which may render such article injurious to the health of a person consuming it." This phrase "injurious to the health" is a grave difficulty. In the British law it is "hurtful," and the impossibility of proving an ingredient hurtful, especially when in small proportion, has caused many defeats. Who can prove that grape sugar in cane sugar is injurious to health? Yet it is an adulteration and a fraud.

The second proviso of this specification has this objectionable phrase repeated, preceded by another very large opening for the escape of defendants who have able counsel. The provisions of this act are not to "apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health, and that the articles are distinctly labeled as a mixture (meaning as mixtures), stating the components of the mixture" (mixtures).

The cases wherein such provisions could be enforced against the efforts of any able lawyer opposing them would be few.

Section 11 directs that all the regulations and declarations of the National Board of Health made under this act shall be printed in the Statutes at Large. This is an excellent provision for placing such regulations, etc., where every one can have easy access to them, and this is doubtless the object of the section. Whether it will give to them the legal force of statutes depends probably upon the organic powers given by Congress to the National Board of Health. If they be printed with the statutes, yet have a doubtful statutory force, they may lead to much litigation in the interests of defendants.

These criticisms on the work of so many able men, now endorsed and supported by so able a lawyer as Senator Miller, are offered with diffidence and hesitation, but they are neither disrespectful nor crude, since they are derived from much experience, observation and thought on the subject of adulteration throughout many years.

Two years ago the writer published a pamphlet embracing a proposed law upon this subject, which will be found as No. XIV. of the series of "Economic Monographs," published by G. P. Putnam's Sons. The law there proposed avoids, in great measure, the supposed defects of the Bill here alluded to, while it contains many prominent points omitted in the Bill. It also contains the British law (since amended)—a law which, in fullness and completeness of detail, contrasts very strongly with this Bill.

CHIAN TURPENTINE AGAIN.

In *The Lancet* of December 17,1881, p. 1033, Professor John Clay, of Birmingham, returns to the subject of the treatment of cancer by Chian Turpentine. From this paper it may be judged that two years has moderated the author's enthusiasm, though it still retains for him the character of an enthusiast. He now, however, has many other elements in the treatment, and evidently manages his cases with such care and attention and general skill, that his results as now given might be expected from the treatment if the Chian Turpentine was omitted. One very important element in his treatment would, however, be left out with the turpentine. Like a number of other enthusiastically recommended cancer cures, this one has often brought hope to the hopeless, and they are probably all, thus far, but other names for hope to the hopeless, and their effect for a time,especially when administered by an enthusiast who can communicate his enthusiasm to his patients, is highly beneficial. Professor Clay's statements, however, still stand almost alone in regard to this agent, whilst those of a number of excellent observers and careful therapeutists have entirely failed to sustain them. Those who remember the careers of Missisquoi water and mud, and cundorango, and the much more numerous professional following that both these agents secured, can hardly fail to recognize the true character of Chian Turpentine, especially now that more modern and better therapeutics distrusts all so-called specifics.

THE USE OF SALICYLATES IN ACUTE RHEUMATISM.

In *The Lancet* of December 17, 1881, p. 1,030, Dr. C. Hilton Fagge, of Guy's Hospital, has a very instructive analytical and statistical paper on this subject, which, from the tone of the paper and the character of the observer, deserves careful attention and will have much weight. Dr. Fagge concludes his remarks by saying that he was cautious, if not skeptical at first, "But where case after case occurred with scarcely a failure, he became satisfied that he had a most potent remedy in his hands. All further experience had strengthened this conviction in his mind, and he would now feel that he was accepting a grave responsibility if he were to withhold a drug which he believed to be so useful from any patient placed under his care, unless there were some good reason for doing so." The discussion of the subject before the Medical Society of London brought out much more testimony to the general value of Salicin and its derivatives in the treatment of Rheumatic Fever, and the discussion was not yet at an end.

OIL OF WINTERGREEN AS AN EFFECTIVE SALICYLATE, IN RHEUMATISM.

An able chemist, namely, Mr. P. Casamajor, of Brooklyn, informs the writer of this paragraph, that arguing from a purely chemical position he expected to obtain better results in acute or subacute rheumatism, and perhaps in chronic rheumatism also, from the use of Oil of Gaultheria, or Wintergreen. This oil is mainly Methyl Salicylate, and was among the earliest sources of Salicylic Acid. Mr. Casamajor supposes that this salt of Salicylic Acid would be easily appropriatd in the economy, and would prove more effective than other salicylates of more fixed character. Carrying out his ideas he had treated himself and several friends who had been subjected to rather sharp attacks of rheumatism with Oil of Wintergreen and with somewhat marked benefit in every case tried. He takes, and gives the oil in doses of ten drops dropped on sugar, and the sugar then mixed with a little water and swallowed about every two hours until the pain is relieved. This simple procedure is well worthy of extended trial and closer observation.

A NEW CINCHONA ALKALOID, FROM CUPREA BARK.

The London *Pharmaceutical Journal and Transactions* of Dec. 17th, p. 497, has two articles upon a new alkaloid found in the recent coppery colored Cinchona Bark which has come in large quantities from South America, and is much used by makers of Salts of Quinia. One paper is by Messrs. B. H. Paul and A. J. Cownley, and the other is by Mr. W. George Whiffen.

These papers concur in their description of an alkaloid not before known, but which is very much like quinia. The sulphate is very much like the Sulphate of Quinia, but some of the other salts resemble those of Cinchonidia. Its chief characteristic as stated by Mr. Whiffen is its action on polarized light. It rotates the polarized ray to the left more powerfully than Quinia, or than any of the alkaloids of Cinchona, and therefore he proposes to distinguish it as "ultra-quinine." It has not been separated in any considerable quantity as yet, and nothing seems to be known of its therapeutic value. From its apparent position in the scale of the Cinchona alkaloids, it should not be inferior to quinia.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. MARCH, 1882. No. 2.

NOTE ON CLINICAL THERMOMETERS.*

Thermometers in general should be to a moderate degree at least, instruments of precision, but that they are not so is becoming pretty generally known. Clinical thermometers are perhaps quite as untrustworthy as any, while from their short range their errors are more difficult to detect, and from their important uses these errors become serious defects. A good thermometer is a very valuable instrument, and is rather rare among the many thousands which are annually sold, but a poor one, like a false weight, is an abomination and a fraud, and, unfortunately, the appearance of the instrument is no indication of its true value, because the skill which finishes them well is of a kind very much cheaper and easier to get than that which adjusts their accuracy. Thousands of very good looking clinical thermometers are annually sold by the makers at one dollar to one dollar and a half each; but he who considers the care, skill, time and labor necessary to the principles involved in a fairly good thermometer, and who yet buys one of these, is simply buying his own folly and shortsightedness, and cheats himself quite as much as he is cheated by the seller.

It would, however, be almost equally a mistake to buy clinical thermometers made with the skill and care requisite to accurate standard thermometers, because the sphere of error in the application and uses of clinical thermometers is so much greater than in the use of very fine instruments that it would be like paying for an assay balance on which to weigh flour or sugar. The aim should be

*A portion of this note was read at the recent annual meeting of the Medical Society of the State of New York.

to get an instrument accurate to within the sphere of other unavoidable errors incident to its uses. Paying for a greater degree of accuracy than this is only so much money wasted. Properly accurate thermometers are always to be had at prices which pretty closely correspond to their true value, but they never can be had at the prices at which the makers are obliged to sell a large proportion of the instruments which are sold and in use, simply because the prices are below the cost of the time, skill and labor essential to the construction of a properly accurate instrument. Prices paid to dealers, however, are not always indications of either true value or of the prices realized by makers. A thermometer good-looking enough to be bought cheaply and sold dearly is the primary object of many dealers. It becomes very necessary to know how to select a good thermometer independently of its appearance and price, and to aid in such knowledge is the object of this note.

Beside the errors which arise from imperfect tubes, a low degree of skill, and the use of incorrect standards in making thermometers, there is one very important source of large error that is not so generally known, namely, the contraction of the glass of which the bulb is made.

It was long ago shown that glass undergoes a process of contraction after having been melted, which, from being comparatively rapid at first, becomes slower and slower during many years; and that glasses of different composition undergo different degrees of contraction, and at different rates. Regnault's observations (given from memory) showed that the contraction noticeable by very careful experiments continued for six years or more, but that after the first three or four years it was very slight and very slow, hardly appreciable to the finest measurements, and therefore not at all important to any but the very finest standard instruments.

It was also shown that if during the course of this contraction, or at any time after it had been completed, the glass was re-heated, even to a moderate degree, and far short of melting, it again expanded to an extent proportionate to the heating; but that after re-heating it contracted much more rapidly than at first, and so regained the degree of contraction which might have required two years to attain, within a few months.

From these facts it follows that a thermometer which is graduated as soon as it is made, though made with proper care and skill, and graduated correctly from a good standard, will have its mercury column pushed up so that the readings from it will all be too high, and this error will increase through many years. This contraction, however, becomes so slight and so slow that after three years, perhaps, it could not be detected in any ordinary thermometer by any ordinary means of observation. And farther, it may be stated as being probable that during the last six months of the three years the contraction in any ordinary thermometer glass would not exceed two-tenths of a degree. Then, as this two-tenths of a degree is within the sphere of other common errors of construction and uses of clinical thermometers, it might be disregarded in view of the additional cost of eliminating this with the other equally small errors of construction and application.

Hence clinical thermometers should always be "seasoned." That is, after being made so far as heating processes are necessary, they should be put away for three years,—or at least for two years and a half, before they are graduated, because after three years, no change of practical importance will occur.

It is probably only the makers of cheap instruments who graduate them as soon as made, and such thermometers being untrustworthy from other causes, are most so from this cause also. It may perhaps be stated,—though rather at random, as they do not tell the details of their business,—that makers who have moderate reputations to keep up, do not as a rule graduate their tubes until they have been seasoned for a year or a year and a half. But as only about one-half of the total contraction will have occurred in a year and a half, such thermometers in three years will be found to read about five-tenths of a degree too high. Hence it occurs that from this contraction alone thermometers which have remained unsold in the hands of dealers, or have remained unbroken in the hands of physicians for two years or more, are often half a degree out of the way, and always too high, while in cheap thermometers it is not uncommon to find them a degree or more out of the way.

A majority of observers will be well served if they get thermometers which are accurate to within two-tenths of a degree. But fairly close observers should not be satisfied with an error of more than one-tenth, unless the error be accurately known, and be applied as a correction to each observation made with the instrument. Of course an otherwise well-made instrument which is old enough to have reached its maximum contraction,—or say over three years old,—if its error be accurately known, and always applied, is as good as if it had no error, and the common practice of all close observers should be to get an instrument of known age and error, and keep it carefully,—not for daily use, but to compare other thermometers by, and then buy cheaper thermometers for daily use and accidental breakage. Every clinical thermometer bought by a physician should be accompanied by a certificate stating when and where it was compared. For many years, and until 1880, the only thermometers having these certificates were compared at the Royal Observatory at Kew Gardens, London, and the certificates of comparison with their standards were supplied by the Kew Observatory at a shilling each. These certificates gave a very great advantage to the English clinical thermometers with which they were sold; but the great demand for these thermometers caused the English makers to send them out unseasoned, though certified, and thus the certificate lost much of its utility, and often accidentally came to be misleading. About 1880, however, the Winchester Observatory of Yale College, at New Haven, Conn., established a thermometric bureau, and placed it under Dr. Leonard Waldo, the astronomer in charge, and now this bureau takes the place for this country, of the Kew Observatory in England. Any physician can now send his thermometer to the Yale College Observatory, and for fifty cents obtain an accurate certificate of its error throughout the scale; and should this thermometer be old enough when sent, the certificate will be good for the entire lifetime of the instrument. It should be a source of great satisfaction to all who use thermometers for any purpose that this well-known Observatory has assumed this important work, and now it will be the fault of observers if they have not corrected instruments. If the results realized in Great Britain from the Kew Observatory should be attained here from the Yale Observatory, it will not be many years before the grossly inaccurate instruments scattered all over this country, for meteorological as well as for medical uses, will be very much diminished in number. At least, if they are not, it will be the blamable fault of the observers who use them. The Yale Observatory also undertakes, for a very small consideration, to seal up packages of thermometers for makers, so that it may issue with them certificates of the age or seasoning of each thermometer.

In selecting a clinical thermometer several important points are entirely within reach of the physican who selects.

First, the index or register being shaken well down, the bulb is taken between the thumb and finger, and the ascending column of mercury carefully observed. If it rises very slowly the glass of the bulb is too thick, or the tube too large. If it rises very rapidly indeed the glass of the bulb is too thin and the thermometer will be easily broken. This defect from thinness of glass is, however, comparatively rare, while those in which it is too thick are very common. When an instrument is found which does not rise very slowly, let it be cleansed, and then placed under the tongue, for about eight or nine minutes by the watch. Then let the temperature be read, and the bulb be at once returned to its position under the tongue for ten minutes more and again read. If the temperature has increased since the first reading, the instrument should be rejected, because a thermometer which does not reach its maximum indication in nine minutes is unfit for clinical uses. It will tire out the patient, and use up a great deal of the physician's time unnecessarily. If the reading has not increased, allow it to cool for ten minutes and again place the bulb under the tongue for six minutes and again read. If now the reading is lower than it was before, then the time required to reach its maximum indication is longer than six minutes but shorter than nine, and it must be again cooled, and again placed under the tongue for seven or for eight minutes according to the difference between the former readings; and in this way a fourth or a fifth trial will determine the point of maximum indication. But if the six minutes reading corresponds within one-tenth of a degree with the nine minutes reading, then it is to be again cooled and placed under the tongue for four minutes,—and so on until the time for reaching its maximum indication is established. Then in all his observations throughout the lifetime of this instrument the physician must always keep it in place for this length of time in order to get a trustworthy observation. The average of good thermometers may be given as from six to eight minutes. Those of three, four and five minutes are exceptional and rare, and are very valuable when found, if well taken care of, for they save a great deal of time. But while an eight minute thermometer may fall on the carpet either in or out of its case and only exceptionally be broken, a similar accident will be almost surely fatal to one of four minutes.

The next point in the selection is to see that the register shakes down easy enough without moving too easily. This will depend a good deal upon the method used by each individual. If the method used by the thermometer makers be used, it will with much ease get any register down, and that without much risk of losing it, but some skill and practice is needed in acquiring this method, and it is not susceptible of being clearly explained. They hold the thermometer rather loosely by the extreme upper end and then give it a quick flirt or sling outward from them somewhat as if cracking a whip, the arm representing the whip-handle and the thermometer the whip-lash. The methods in almost universal use are all much inferior to this, and are too well known to need description, and the observer must select his instrument to accord with his own method if he does not choose to acquire a better one. If the register moves down too easily it will in all thermometers, except one variety, be liable at any time to be lost by causing it to coalesce with the body of mercury below it; and if lost, the thermometer, as a rule, is hopelessly spoiled. The register should be separated from the mercurial column below it by a distance almost inappreciable to the naked eye when the instrument is at the lower end of its scale. The thermometer with "indestructible index" is made on the principle of Phillips' maximum thermometer, namely, by a narrow contraction near the bulb. But in this case the contraction must be so much narrower than in the Phillips instrument that the mercury passes through it by jumps, and of course the whole column rises by jumps, so that it does not indicate with accuracy to tenths of a Fahrenheit degree. These thermometers differ somewhat in the length of their jumps, and probably the makers will improve upon them in future, but at present they are not adapted to very close observations, though perhaps accurate enough for ordinary indiscriminate use. It may be safely said, however, in regard to the ordinary clinical thermometer that a register is never lost except by mismanagement, and such mismanagement is much more frequent with thermometers which shake down easily. To this it may be added that physicians, as a rule, are dissatisfied with instruments which do not shake down easily, and this is the reason for so many lost registers. Registers are often, if not generally, lost at the first or second shaking down, by supposing they are hard to shake down when they are not, or by using some bad method of shaking. Hence a new thermometer should be shaken down with great care until the observer knows how much force is required.

Almost all clinical thermometers are graduated to fifths of a degree, but are easily read to tenths, the only difficulty being with the shorter ones, where the marks for fifths are so close that the distortion by thickness of glass on the stem makes it difficult to hold the instrument exactly at a right angle with the line of accurate vision. Any one of these short thermometers can be easily read one or two-tenths out of the way on either side of its true indication by this distortion of the glass, and by holding the thermometer badly. A great improvement has been made of late years by Hicks, of London, for reading these short thermometers, or indeed for the reading of any clinical thermometer. Hicks holds a patent for making the stem of such a form that he gets the magnifying effect of a lens upon the column of mercury when the instrument is properly held. Such instruments he calls "Lens-front Thermometers." In selecting one of these, care is necessary to see that the line of graduation is so placed as to be well seen by the magnifying front. In some of Hicks' instruments when the column is brought under the graduations it is only seen edgewise, and without being magnified. For the reading that is necessary to very careful and clear observations a five-inch or a six-inch clinical thermometer is much the best length, because it gives a much more open graduation. But four-inch is the length generally preferred, because better adapted to the pocket. Thus, probably, nine-tenths of all that are sold are four-inch. A three-inch instrument is made by some makers, but the graduation is too close to be read with a useful degree of accuracy even if a glass be used in the reading.

Finally, in selecting, the bulb should be slowly and carefully warmed by holding it near some source of heat until the mercury has slowly risen to within one or two degrees' length of the top of the capillary tube, the highest point reached being carefully noticed. If the tube above the mercury contains much air the register will be pushed down by it as the instrument cools. Such an instrument is not trustworthy. As a rule a clinical thermometer should not be bought without a certificate of either Yale or Kew Observatories, and care should be taken that the number of the certificate has not been altered, and that it agrees with the number of the thermometer with which it is sold. If the date of the certificate be more than six months past, it, with the thermometer, should be sent to the Yale Observatory for a new verification, because the thermometer may have been newly made when the certificate was issued, and if so, with some varieties of glass in use, it may be a degree or more out of the way in six months. An excellent practice for any physician is to buy a good thermometer with a certificate of as old a date as he can get, and put it away for a period of three years from the date of the certificate. Then send it to Yale for a new certificate, keeping it afterwards as a standard by which to ascertain the errors of those which must be bought from time to time as they are broken in use. Such a thermometer is very valuable, and may do excellent duty among neighboring physicians. One of the very prominent uses of these certificates is to indicate the "calibration" of the mercury tube. If this tube be wider at some places than at others, as is commonly the case, the error of the thermometer will vary at different parts of the reading scale, because the scale is mathematically divided. These variations appear on the certificate for each five degrees, and it commonly occurs that there is a difference of one or two-tenths in each five degrees, since a practically uniform tube is rather rare even for so short a range. As these errors in tube-diameter do not change, successive certificates for the same instrument should always show the same variations. Hence it is that any one who has an old instrument with a certificate can easily compare any other instrument having a certificate, and correct all its errors by a single observation at any part of the scale. The two instruments are cleansed and the bulbs are together placed under the tongue for the maximum time of the slowest instrument, and they are then carefully read. Now, for example, if the reading of the standard instrument should be 99.1° and its error at 100° by its certificate should be "—·6°," then the true temperature would be (99.1—·6=) 98.5°. Then suppose the one to be compared with the standard read 99.3° and its error at 100° by its certificate was "—·3°," its reading if corrected by its own certificate would be (99.3—·3=) 99°, but corrected by the standard it should be 98.5° and is therefore ·5° too high by its certificate, and ·8° too high by the standard. This would show that it had risen ·5° since the date of its certificate, and that to correct its readings now ·5° must be added to each one of the errors of its certificate. That is, its true reading will be at each point its former cerficate error plus its new error. If its certificate read as follows:

" At 95°	—·2°"	—·2+—·5= —·7°
" 100°	—·3°"	—·3+—·5= —·8°
" 105°	—·2°"	—·2+—·5= —·7°
" 110°	—·1°"	—·1+—·5= —·6°

Then its correction by the present comparison with the standard would be as indicated by the figures at the right of the older corrections. This simply expresses the fact that there was a narrow place in the mercury tube somewhere about the 100° graduation, and that in consequence of this the readings, to be true, must be corrected in this way. It must be noticed that in these certificates the minus sign "—" placed before the error does not mean that the thermometer reads too low, as many physicians suppose, but, on the contrary, that it reads too high, and the error must be subtracted in order to get the true reading. This is clearly explained on each certificate, yet it does not seem to be understood. It would have been better, perhaps, had the signs been avoided and the words "too high" or "too low" used instead, for then there could have been no misapprehension, nor any explanation needed. It is possible that Yale may be induced to make this improvement over Kew, for certainly Yale usage should be very soon the rule for this country. And it may be hoped, too, that Yale will make another step in advance of Kew by putting upon each certificate the time required for each certified instrument to attain its maximum indication when placed under the tongue. This, however, takes a good deal of time, and is of less importance, because each physician can do it for himself if he chooses, and he cannot use his instrument intelligently without knowing the time it requires. It is, however, very certain that a very large number of observations are valueless in consequence of insufficient time being allowed for the instruments to reach their highest point.

In the application of the clinical thermometer, if the physician has a safe slow instrument and wants to save time, he has only to call for a glass of tepid water, and, having assured himself that it is not above blood heat, to stir the thermometer and lower part of the stem round in the water for half a minute to one minute, and when he sees that it has nearly reached the normal temperature transfer it quickly from the water to the patient's mouth. A thermometer which requires eight minutes to reach its maximum indication under the tongue will reach the same point in less than half the time in a glass of water of the same temperature as the mouth, because the surface contact is so much more rapidly changed in the case of the water. This use of water has another advantage of so much importance that it should really be uniformly adopted. The cleanliness of it addresses itself at once to the sensibilities of patients, for few patients can help mentally wondering whose mouth that thermometer has been last in. A successful eye-surgeon or a successful dentist always takes care to let his patient see him wash his hands in clean water and dry them on a white napkin taken unfolded from his drawer. Then why should not a physician let his patient see him rinse off his thermometer before and after applying it? There can be no doubt that the anus is slightly the best place for the thermometer in observations of temperature. Yet except in cases of young children, and in very exceptional conditions in adults, the inconveniences far overbalance the slight advantages, and the mouth is now becoming very generally accepted as far the best place. The axilla has one or two disadvantages that are perhaps rarely thought of. In dry and harsh conditions of the cuticle, not rare in cases requiring frequent observations by thermometer, the cuticle becomes so bad a conductor that even by waiting a very long time the thermometer gives an indication much below that of the mouth at the same time. This can be measurably corrected by sponging the axilla out with tepid water, and leaving it moist when the thermometer is placed in it. The other difficulty is that when a thermometer is placed in the axilla, some pressure of the arm is needed to keep it in place, and this pressure diminishes the cutaneous circulation in the parts in contact with the instrument, and this in time lessens the temperature so that the thermometer indication is liable to be too low. In the conditions of enfeebled circulation of low fevers, the errors of observation from this cause are often important. If any one will take the bulb of a sensitive good thermometer between the moistened surfaces of his finger and thumb and compress it pretty firmly for the time needed to attain its highest indication, and notice carefully what this indication is, he will find it very low, because the pressure has impeded the circulation and kept the blood out of the parts. Let him now slack up the pressure gradually and he will soon see the temperature begin to rise as more blood begins to circulate in the parts, bringing with it the internal temperature.

Hence, when all circumstances are fairly considered, the rapidly increasing custom of using the mouth for temperature observations is the best, and whenever it is adopted, then cleanliness, even to great nicety, should be used, and the success which attends the cleanly eye-surgeon or dentist will be sure to follow. This plea for cleanliness, which comes so near to Godliness, may be impressed by a little story which, if not true, is well found ("è ben trovato") for the illustration it affords. The scene presents a philanthropic visiting committee at the second bed from the door of a hospital ward.

"Well, my man, how are you getting on? Is there anything we can do to make you more comfortable?"

The patient, after a little modest circumlocution, admits that there is one thing he would very much like, and that is, to exchange beds with the man next to the entrance door of the ward.

"Well, but why do you wish to make that change particularly?"

The patient thought it would be more airy and cheerful there, with a better light, and these did not matter to the patient there now, for he was either unconscious or slept all the time.

When pressed for a better reason, however, he gave it.

"The doctors always come in at that door, and they put the same thermometer in my mouth that has just been in that man's stern."

"THE ELIXIR NUISANCE" AND THE NEW PHARMACOPŒIA.

Some years ago, at one of the meetings of the American Pharmaceutical Association, a speaker alluded to the then growing popular delusion as "the elixir nuisance." This significant expression came from the pharmaceutical side of the question entirely, and it meant that each agent of travelling salesman of each manufacturing establishment would capture a certain number of physicians by his samples and his smart therapeutic logic, and thus "create a demand" which the pharmacist was called on to supply. And in order to supply this demand the pharmacist must keep on hand an assortment of the elixirs of every manufacturer who saw fit to send a drummer through the country, and thus his shelves became loaded with elixirs, many of which were duplicates, excepting only in the names of the makers. To mitigate this evil, created rather by the cupidity of trade than by the necessity of any true or legitimate therapeutics, the National Association appointed a committee to prepare a set of formulas for elixirs, which, for all legitimate uses, would enable pharmacists to offer to physicians preparations of their own make from good formulas published by the authority of the Association. Such preparations, however, never gained a general popularity against the trade preparations of the manufacturers, because, from having a more useful proportion of the medicaments and a smaller proportion of alcohol and sugar, they were much less agreeable to the taste, and these often served the drummer in his missionary work for the conversion of physicians and their patients, as samples, which, by contrast with those from his manufactory, showed how much more agreeable his elixirs were. These waves of fashion in medicines must, however, have their ebb as their flow, and even the most enterprising manufacturers, with the ablest of drummers, cannot command a continuous high tide for any one article of popular fallacy, and new fields must be sought for the old articles, and new articles for the older fields of mercantile labor.

When "the elixir nuisance" had probably passed its height, but was still a popular source of revenue and harm, it naturally and necessarily came before the Committee of Revision of the U. S. Pharmacopœia, and is before that committee still, upon the question whether or not to admit this class of preparations to the national standard; and it is the object of this note earnestly to offer some objections to their admission as a basis of protest against such admission.

First, the polypharmacy of all such preparations is generally acknowledged to be hurtful to all the true interests of therapeutics. All the true progress in modern rational therapeutics is based upon a very simple, uncomplicated medication which commonly applies one well-studied medicament at a time to obtain a well-defined effect. The old scattering shot-gun principle, which, if not used at too close quarters, is sure to hit more things than one, is rapidly giving way to the single missile well aimed at a definite object which is clearly in view. And the physicians who know how to use their uncomplicated agents, but do not know how to administer,—and when necessary, how to combine them without being taught by the manufacturers or their drummers,—must necessarily diminish in number, if not through the better teaching of the schools, then through the surer operation of the law of survival of the fittest.

Secondly, these elixirs are but inferior triplicates of agents already duplicated in the older and better tinctures and fluid extracts, the main difference beside novelty and fashion being a more attractive form for administration. This alleged advantage of elixirs, however great or small it may be, does not bring them within the proper or legitimate scope of a pharmacopœia, because pharmacopœias do not aim to be standards for methods of administration of medicines. The choice of vehicles, as of combinations, is wisely left to the physician and pharmacist to be varied by the skill and judgment necessary to each individual case. And the physician and pharmacist who together cannot apply alcohol, sugar and flavoring and coloring material as well as they are applied in the class of elixirs, are hardly worthy of their important callings. Again, the combinations of active medicines met with in the most popular elixirs can no more fit any large class of cases, consistently with the progressive knowledge in accurate medication, than the same size coat can fit a regiment of men. Every man could put the coat on, as every patient could take a compound elixir, but only in accidental instances would there be a proper or accurate fit. No two cases of disease can, except by accident, require the same proportions of iron, quinia and strychina at the same time, and it would be a grave mistake for a pharmacopœia to recognize such erroneous principles of medication as are here involved, especially at the present time, when all pharmacopœias are so actively engaged in eliminating those heterogeneous mixtures, many of which are supported by long experiences in use.

It does not need a very profound analysis of the past success of "the elixir nuisance" to show that it consisted mainly of two elements; first, extensive advertising and drumming, and next, a certain convenience or so-called saving of time and labor to the physician in having his prescriptions written and put up for him in an agreeable form by a large manufacturer, who thus supplies him not only with his materia medica but also with the therapeutics upon which it is to be applied. Neither he nor the pharmacist have to think or act for themselves, but have simply to hand out parcels of compound elixirs and pills. And this is called saving of time, labor and expense!

A third and most grave objection to elixirs and to their recognition in any form or any degree by the Pharmacopœia is that from the very first they have stimulated the growing evil of popular or self-medication, and it is highly probable that the great mass of all that have been sold have gone into this abuse. Popular, as contradistinguished from professional pharmacists, and popular dry goods stores have sold dozens into popular use where physicians have prescribed single bottles; and "Beef, Wine and Iron" is still an occasional addition to the stock of the enterprising dry goods merchant. To realize the great danger inseparable from this large popular use of elixirs it is only necessary to remember that they are highly flavored, and to most palates agreeable mixtures of alcohol and sugar, or in other words are alcoholic stimulants under a disguise in both name and character, which especially adapts them to the tastes of the women and children of this candy-loving age. Indeed, they are often little else than fluid candies with the most dangerous addition of alcohol hidden away in them. Hence it is that physicians and laymen so often hear that elixirs agree so well with women and children, and that if physicians don't give them such things they will either take nothing or send for a homœopath, whose medicines are always pleasant. If the alcohol habit has not been largely extended by the introduction of elixirs, then means especially adapted to a specific end have for once failed. But there is good reason to believe there has been no failure here. Should the Pharmacopœia then lend its sanction and weight of authority to such a class of preparations when already its Tinctures have occasionally been recognized as the source and origin of the alcoholic habit, and when one of the best arguments for its Fluid Extracts has been their minus proportions of alcohol?

A fourth objection to the introduction of elixirs into the Pharmacopœia is that as a class of preparations for professional use, at least, they have passed their flood-tide and are now naturally on the wane. If they had done all the harm they could do, and were now going out of fashion beyond redemption, like hoop-skirts, then it would not matter so much that the Pharmacopœia should introduce them behind their day. But they have not ceased to do popular harm, and probably now never will until some more ingenious and insidious form of tippling supersedes them with those who cannot go to the "saloon" or the "sample room." Hence, should the Pharmacopœia now, at this late day, use its high authority to re-establish in the medical and pharmaceutical professions an abuse which seems to be rather rapidly dying out there, it will simply strengthen and extend the abuse while weakening and belittling its own character as a standard.

It is not probable that one in ten of the better educated physicians upon whom the better educated classes of the community depend in their hour of need ever use these popular elixirs. Then for all other classes of physicians and patients, the large variety of elixir formulas carefully prepared and authoritatively published by The American Pharmaceutical Association at the high tide of the fashion in 1875, volume 23, will surely be sufficient for all legitimate or semi-legitmate demands.

Moreover, all the pinciples involved in the construction of such a class as the elixirs belong especially to the domain of what is now called "elegant pharmacy," and are as appropriate to The American Pharmaceutical Association as they are inappropriate to the United States Pharmacopœia.

If the Committee of Revision will make an intelligent forecast of the future of this class of preparations, it seems not at all probable that they will induce them, even if they have of late thought of doing so.

THE NEW CODE OF ETHICS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

The most important action by far of the late annual meeting of this State Society was the adoption of an amended code of ethics, or rather of a code of ethics in which one particular rule in regard to consultations is reversed from what it was before, and from what it is in all other medical organizations of this country so far as known.

At the annual meeting of last year a committee was raised to revise the Code of Ethics, and at an early session this year that committee presented the following revised code as their report. The committee consisted of Drs. Wm. C. Wey, C. R. Agnew, S. Oakley Vander Poel, Wm. S. Ely and Henry G. Piffard.

CODE OF MEDICAL ETHICS.

I. THE RELATIONS OF PHYSICIANS TO THE PUBLIC.

II. RULES GOVERNING CONSULTATIONS.

III. THE RELATIONS OF PHYSICIANS TO EACH OTHER.

I.—The Relations of Physicians to the Public.

It is derogatory to the dignity and interests of the profession for physicians to resort to public advertisements, private cards, or handbills, inviting the attention of individuals affected with particular diseases, publicly offering advice and medicine to the poor without charge, or promising radical cures; or to publish cases or operations in the daily prints, or to suffer such publications to be made; or through the medium of reporters or interviewers, or otherwise, to permit their opinions on medical and surgical questions to appear in the newspapers; to invite laymen to be present at operations; to boast of cures and remedies; to adduce certificates of skill and success, or to perform other similar acts.

It is equally derogatory to professional character, and opposed to the interests of the profession for a physician to hold a patent for any surgical instrument or medicine, or to prescribe a secret nostrum, whether the invention or discovery or exclusive property of himself or of others.

It is also reprehensible for physicians to give certificates attesting the efficacy of patented medical or surgical appliances, or of patented, copyrighted or secret medicines, or of proprietary drugs, medicines, wines, mineral waters, health resorts, etc.

II.—Rules Governing Consultations.

Members of the Medical Society of the State of New York, and of the Medical societies in affiliation therewith, may meet in consultation legally qualified practitioners of medicine. Emergencies may occur in which all restrictions should, in the judgment of the practitioner, yield to the demands of humanity.

To promote the interests of the medical profession and of the sick the following rules should be observed in conducting consultations.

The examination of the patient by the consulting physician should be made in the presence of the attending physician, and during such examination no discussion should take place, nor any remarks as to diagnosis or treatment be made. When the examination is completed, the physicians should retire to a room by themselves, and after a statement by the attending physician, of the history of the case and of his views of its diagnosis and treatment, each of the consulting physicians, beginning with the youngest, should deliver his opinion. If they arrive at an agreement, it will be the duty of the attending physician to announce the result to the patient, or to some responsible member of the family, and to carry out the plan of treatment agreed upon.

If in the consultation there is found to be an essential difference of opinion as to diagnosis or treatment, the case should be presented to the patient, or some responsible member of the family, as plainly and intelligently as possible, to make such choice, or pursue such course as may be thought best.

In case of acute, dangerous or obscure illness, the consulting physician should continue his visits at such intervals as may be deemed necessary by the patient or his friends, by him or by the attending physician.

The utmost punctuality should be observed in the visits of physicians when they are to hold consultations, but as professional engagements may interfere or delay one of the parties, the physician who first arrives should wait for his associate a reasonable period, after which the consultation should be considered as postponed to a new appointment. If it be the attending physician who is present, he will of course see the patient and prescribe, but if it be the consulting physician, he should retire, except in an emergency, or when he has been called from a considerable distance, in which latter case he may examine the patient and give his opinion in writing, and under seal, to be delivered to his associate.

III.—The Relations of Physicians to each other.

All practitioners of medicine, their wives, and their children while under paternal care, are entitled to the gratuitous services of any one or more of the faculty residing near them, whose assistance may be desired.

Gratuitous assistance cannot, however, be expected from physicians called from a distance, nor need it be deemed obligatory when opposed by both the circumstances and the preferences of the patient.

The affairs of life, the pursuit of health and the various accidents and contingencies to which a medical man is peculiarly exposed may require him temporarily to withdraw from his duties to his patients, and to request some of his professional brethren to officiate for him. Compliance with this request is an act of courtesy which should always be performed with the utmost consideration for the interest and character of the family physician, and when exercised for a short period, all the pecuniary obligations for such service should be awarded to him. But if a member of the profession neglect his business in quest of pleasure and amusement, he cannot be considered as entitled to the advantages of the frequent and long-continued exercise of this fraternal courtesy without awarding to the physician who officiates the fees arising from the discharge of his professional duties.

In obstetrical and important surgical cases, which give rise to unusual fatigue, anxiety and responsibility, it is just that the fees accruing therefrom should be awarded to the physician who officiates.

Diversity of opinion and opposition of interest may, in the medical as in other professions, occasion controversy and even contention. Whenever such cases unfortunately occur, and cannot be immediately terminated, they should be referred to the arbitration of a sufficient number of physicians before appealing to a medical society or the law for settlement.

If medical controversies are brought before the public in newspapers or pamphlets, by contending medical writers, and give rise to, or contain assertions or insinuations injurious to the personal character or professional qualifications of the parties, the effect is to lower in the estimation of the public, not only the parties directly involved, but also the medical profession as a whole. Such publications should therefore be brought to the notice of the County Societies having jurisdiction, and discipline inflicted, as the case may seem to require.

This committee report was not radical enough for some members, and Dr. D. B. St. John Roosa offered the following substitute for the report, and explained and supported the substitute very warmly throughout the animated discussion which followed.

Substitute for the Report of the Special Committee on Amendments to the System of Medical Ethics.

The Medical Society of the State of New York, in view of the apparent sentiment of the profession connected with it, hereby adopt the following declaration, to take the place of the formal code of ethics, which has up to this time been the standard of the profession in this State:

With no idea of lowering, in any manner, the standard of right and honor in the relation of physicians to the public, and to each other, but, on the contrary, in the belief that a larger amount of discretion and liberty in individual action, and the abolition of detailed and specific rules, will elevate the ethics of the profession, the medical profession of the State of New York, as here represented, hereby resolve and declare that the only ethical offences for which they claim and promise to exercise the right of discipline, are those comprehended under the commission of acts unworthy a physician and a gentleman.

Resolved, Also, that we enjoin the County Societies and other organizations in affiliation with us, that they strictly enforce the requirements of this code.

This substitute was first discussed, and much was said in advocacy of it about the puerility and narrowness of codes of ethics as formularies, and of the great superiority of the "unwritten law." One who attempted to listen to all this dispassionately, and who did not know beforehand that the medical profession of this State was not yet angelic, could only reach one conclusion, namely, that "acts unworthy a physician and a gentleman" were well known and well defined, and had the same force, value and acceptation to all men; and that there was so little disposition left in the profession to commit any such acts that it was only necessary to make a resolution and declaration in regard to them. But just here it would occur to the listener to ask for the logical basis of any such resolution or declaration. If codes and laws were illiberal, puerile and unnecessary in the presence of the "unwritten law," why should it be necessary to "resolve and declare?" The more logical course would seem to be to simply abolish all codes and laws when they were no longer necessary. The proposition to have any substitute whatever simply weakens the position taken and begs the question. For example, suppose that because there had not been a burglary committed in any court-room of the State, or within the personal knowledge of any judge for a year, the laws against burglary should be abolished as being illiberal, puerile and unnecessary in the presence of "unwritten law," this would be equivalent to assuming that there were no longer any burglars left. Then, what would be the force of resolving and declaring that all burglars must be gentlemen?

Yet, notwithstanding the apparent absurdity of abolishing law, with human nature constituted as it is, so ably was the proposition advocated, or, rather, so feebly was it opposed, that upon a critical vote, by calling the yeas and nays, there was found to be 40 votes for the substitute and 38 against it—78 votes in all. Then, as a two-thirds vote was necessary to change the by-laws, as this would do, the substitute was declared to be lost and the consideration of the report of the committee resumed, Dr. Roosa advising all who had supported his substitute to transfer their support now to the report of the committee as being the best they could now get.

In this report of the committee, as given above, the only very material change from the old code, and apparently the chief object of interest to the committee in the old code, was in regard to the law forbidding consultations with irregular practitioners of medicine, or those who profess to be or are unfaithful to the "scientific principles and approved doctrines" of medical practice. This prohibition is withdrawn and a permission, which is the reverse of it, is given in the words "may meet in consultation legally qualified practitioners of medicine," because in this State and others many "practitioners of medicine" are qualified by law who profess or practice upon dogmas which are at variance with or in opposition to the principles of established rational medicine as represented in this State Medical Society. It is with these lawful professional outlaws that the committee wish to establish consultations, and some of the prominent reasons advanced for this during the discussion were as follows :

First, on grounds of common humanity, it was wrong to refuse skilled services to suffering when in need.

Next, it was illiberal and ungenerous, and inconsistent with the spirit of the age to withhold professional aid from other practitioners simply because they were of a different creed or belief.

Next, by consulting with such in a proper spirit these errors might be better shown to them and be corrected.

Next, by consulting with them the charge of persecution against them would be silenced, and they would soon return to the regular practice, and suffer their fallacies to die out.

These reasons were met and controverted by others which are familiar to all medical men as set forth in the various codes of ethics, but it soon became plain that the committee's arguments would carry the day. This writer urged that, inasmuch as this proposed change was not only radical but revolutionary, and that it legislated for all the county societies of the State without giving them a hearing upon it,—that the report be laid over until the next meeting for final action, and that in the meantime both the report and the present discussion be published, so that the general profession might think over the subject for a year, and come up fresh from the constituent bodies with due preparation for so very important a measure. The amendment was lost by a decisive vote.

Then this writer attempted to get in a substitute for the consultation clause under discussion, but was prevented from finishing the reading of his substitute by a counter-motion made while he had the floor. This substitute was as follows:

Emergencies occur wherein the demands of humanity require that a physician should obey any summons regardless of whom he might meet or consult.

Through considerations of humanity, liberality and generosity, a physician may meet in consultation any practitioner of medicine, whether legally qualified or not, and practising under any name or dogma, however irrational, and may render to such all possible aid during any length of time, provided that he shall neither charge nor receive any fee of any kind for such irregular services.

Some such substitute as this would have satisfied all the arguments based on humanity, liberality, generosity, persecution, antagonism, etc., and would not have been unworthy of physicians and gentlemen; and the writer was prepared to argue that if physicians would confine the business and financial relations of their profession to their professional brethren of the same faith and modes of practice, they might then consult with whom they pleased with perfectly clean hands. But that the moment they accepted a pecuniary consideration for such services they became, in the natural order of things, liable to injurious suspicion of interested motives unworthy of physicians and gentlemen.

But the meeting seemed in no temper to consider any such action as this, even if it had been possible to present it; and when at a late hour, after a long discussion, the vote on the final adoption of the committee's report was taken, it was found to be 52 in the affirmative and only 18 in the negative, or five votes more than the requisite two-thirds.

It remains now to be seen how far this unexpected and revolutionary legislation effected by fifty-two votes will be acceptable to the many hundreds of physicians whom it controls, but who are not represented in it. A large class, namely, those who do as they please, regardless of codes, will not be affected by it at all. Another large class, who cannot stultify themselves by the sham of trying to mix up theories and practices of medicine which are utterly incompatible and opposite in principle, under the name of consultations, will not be disturbed or affected by it. But another very much larger class, who by their excessive numbers throughout the country are struggling for a living against frightful odds,—if influenced by their pecuniary instincts, will gladly accept the legislation, and will follow their prominent professional leaders gladly, and thank them for their precept and example.

This writer read the report of the committee without getting any strong bias against it, and went into the discussion with a strong desire to hear and weigh well all that could be said in favor of it, hoping to be able to support and vote for it. After listening attentively to all that was said, however, and now, after having reviewed the whole subject with earnest care, he cannot help regarding the movement as being very dangerous and unwise, and as being an important step in the direction of professional disintegration and decay. In a profession very much overloaded in the proportions between its numbers and its work, and very much undereducated, there is an inherent tendency to disintegration. The more educable few become well educated and successful, mostly as specialists, while the many less educable and poorly educated have to skirmish for a doubtful and precarious living, and thus the rich become richer because the poor get poorer. Under such conditions, any step in the direction of disintegration is very much to be deplored.

How this step appears from the side of the irregulars who are now to be consulted with, may be seen from a statement said to have been publicly made at the late meeting of the State Homœopathic Medical Society by its president. In alluding to this movement he is reported to have said, in substance, that now that the population of the State is becoming so largely homœopathic the older profession must fraternize with homœopathy in order to prolong its existence.

It is to be hoped,—and probably it may be expected that the county societies throughout the State, by whose delegations the State society is really constituted,—will take this subject up during the year and send up their delegations to the next annual meeting charged by deliberate consideration to either revoke or confirm this legislative action.

WINTER ECZEMA.

There appears to be something in the winter climate, at least of the sea-board States, to cause in many persons a troublesome itching of the surface, generally of the extremities. This itching abates or disappears during mild and moist weather, but recurs with every cold, dry clearing up of the weather. From being slight at first it is apt to increase and become very troublesome, especially upon undressing, and through the night. At this stage vigorous scratching becomes irresistible, and then the surfaces soon become abraded, red and papular with an exudation which sooner or later becomes copious, drying in crusts on some parts, but presenting open ulcerative patches on others. In this stage the itching is replaced by soreness and irritation, and the tendency seems to be to become worse instead of better. By a consideration of the climatic conditions which seem to start and keep up this affection in persons who are otherwise in good health, there seemed to be an indication for some agency to keep the surface from becoming too dry,—to keep it in dry cold weather in a similar condition to that of mild moist weather. This would be accomplished by a proper use of glycerin. Then there is a very evident indication for an effective astringent to prevent or correct the tendency to the exudation, and such would be found in tannic acid. Add to this a moderate stimulation of the surface to take the place of the scratching in the relief which this gives, and then the indications for the following solution are fulfilled :

Take of Tannic acid 2.6 grammes, or forty grains.
Glycerin and alcohol, of each, 15 cubic centimetres, or half a fluidounce.
Water sufficient to make 120 cubic centimetres, or 4 fluidounces.

This solution applied to the itching surfaces by means of a small sponge or rag, morning and evening, will in a large proportion of cases avert the affection. The itching will be reduced, or will cease altogether, so that scratching can be avoided, and as the other stages arise from the scratching they will fail to occur. If the affection shall have gone on to the stage of irritation and exudation before the solution is resorted to, the solution may then be found to be too strong. Then if diluted with an equal volume of water for a time, until the surface is re-established, it will better serve the purpose, but after this it should be resumed in full strength.

When once the affection is found to be curable in this way, it should never be again allowed to go beyond the beginning of the itching stage before the remedy is applied. After being thus cured once or oftener during the winter, it is apt to recur at the beginning of the next winter and must be watched for. The solution does not keep indefinitely and should be freshly made for each attack.

OPIUM ASSAYS.

Since the publication of the last note on Opium, assays of four cases have been made which presented important peculiarities. These cases were all direct importations into this market and were sent here as being of very fine quality. On careful inspection the representations of quality were well sustained, for the Opium appeared to be very good. The cases differed very much in some respects, but not in the internal appearance of quality or richness. One case was of uniformly small lumps, so that there were between 300 and 400 lumps in the case, as against the usual number of from 150 to 250. Another case was so soft that the lumps had all coalesced into one mass, while the other two cases presented the more usual appearances of Opium of higher grade. All were of very uniform consistence throughout each case, and all of good consistence, except the one which was so soft as to coalesce. The cases were separately sampled and assayed, giving the following results :

Morphia	10.8	per cent.	Insoluble Residue	28.4	per cent.	Water	24.6	per cent.
"	10.8	"	"	31.3	"	"	23.6	"
"	9.8	"	"	24.7	"	"	23.6	"
"	9.9	"	"	24.8	"	"	17.7	"

When reduced by calculation to dried and powdered Opium, the powder would assay 14.4, 14.1, 12.9 and 12 per cent. of morphia.

Thus this Opium, which was unusually good in appearance, proves to be about of the average market quality for "prime Smyrna Opium," often called Karahissar. The peculiarities developed by the assay process were—First, the very unusually small proportion of insoluble residue. In two of the cases this residue was of the usual character, only very small in amount. In the last two cases it was very different in character as well as small in amount,—

smaller even than the first two cases, and the smallest insoluble residue ever met with by this writer. Then the proportion of water is unusually great, except in the last case, and there it is unusually small. This was the case which contained so many small distinct uniform lumps. Judging by the appearance of this Opium, in comparison with the higher grades of this market, such as the Boghaditch, Yerli, Salonica, etc., it would be said to contain not less than 12 to 14 per cent. of morphia. That is to say, the appearance would be likely to mislead an ordinary observer by about 3 per cent. of morphia, which is equivalent to more than a dollar a pound in actual value.

The insoluble residue in the higher grades of Opium, which this resembles, rarely falls below 36 per cent., and ranges from that to 40 per cent., perhaps, for Opium in the moist condition (42 to 48 per cent. when dried and powdered), and from this it must be reasonably inferred that some soluble matter had been added to this Opium probably to improve its appearance.

From time to time, within the past year or two, private reports have been made to the effect that a new diluent for Opium was being used in Asia Minor, by which the appearance was improved, and once or twice this new diluent was reported to be strained fig paste. Some such diluent as this, holding a large proportion of water, and being soluble in water, would easily and rationally account for the peculiarities of this Opium, and it is, therefore, probable that this has been made up in some such way to imitate the higher grades, and sent into the market for deception.

THE USE OF SALICYLATES IN ACUTE RHEUMATISM.

The discussion of this important subject by the Medical Society of London has been so prolonged and complete as to warrant a more extended review of it than that contemplated in the brief notice of the last Ephemeris. Hence the following summary, imperfect as it is, may still be useful to those who may not be induced to read the very important articles here quoted

In *The Lancet* of December 24, 1881, p. 1080, is an "Analysis of Statistics illustrating the action of Salicin Compounds in the

Treatment of Acute and Subacute Rheumatism," by Dr. Francis Warner, assistant physican to the London Hospital and East London Hospital for Children. Tables are given embracing an experience of four years, and these are summarized as follows: "In 190 cases in which salicylic acid was employed the average duration of pyrexia was 5.5 days. In 79 cases without salicin, the average was 13.8 days.

"In 277 cases in which salicin was used the average duration of pain was 5.3 days.

"In 67 cases without salicin the average was 9.3 days."

In 342 cases with salicin, the average confinement to bed was 19.5 days. In 211 cases without, the average was 23.5 days.

In 352 cases, with salicin treatment, the average time in hospital was 34.9 days. In 387 cases without, the average was 36.2 days. From these data, it appears that the salicin treatment has a very great advantage in every respect, and that in the duration of fever and pain the advantage is more than double. In cases under salicin treatment, "heart disease developed in 13.6 per cent. ; in cases treated otherwise, in 14.9 per cent. Relapses occurred in 33.6 per cent. of the salicin cases," at the average time of 15.2 days, lasting on the average 3.5 days.

On page 1081 of the same journal, an abstract of a paper read by Dr. Isambard Owen is given. This embraces 210 cases of acute and subacute rheumatism occurring in St. George's Hospital in 1877 and 1878. These cases are carefully tabulated in six sections, and from the analysis thus shown, the following conclusions may be justly drawn: The treatment by salicylates, whether in large, medium or small doses (3, 2 or 1½ drachms per diem), gave an average duration of fever and pain of 3½, 4 and 4½ days; while for cases treated by full doses of alkalies, with or without quinia, the average duration of fever was 6½ days, and of pain 8 days,—an advantage for the salicylates of nearly 50 per cent. The duration in hospital was practically the same under all the varieties of treatment. Relapses occurred in about 30 per cent. of the cases treated by salicylates, and in 27.6 per cent. of those treated by alkalies, with or without quinia, with an average duration of about 5 days for salicylates, and of 2 days for alkalies, thus showing a very considerable advantage for the alkaline treatment in this respect. The average days of illness from the commencement of treatment was for salicylates, 6.3 days, and for the alkalies, 10.3 days. Heart complications were few and the results not significant. Toxic symptoms were seen in a number of cases, all abating when the salicylates were suspended. "No cases of hyperpyrexia occurred, and none ended fatally."

In the same journal, same page, Dr. De Havilland Hall gives statistics based on 54 cases of acute rheumatism treated both with and without salicylate of soda. His conclusions are: "In contrasting the cases—38 in number—treated by the salicylate of soda, it will be noted that their average stay in hospital was less than a day in excess of the average stay of the 16 cases treated without the salicylate, and that in comparing the days of fever and pain the advantage is still more distinctly in favor of the salicylate plan. In comparing the heart complications which occurred 19 times under observation, the proportion between the two sets of cases is practically the same. This speaks highly in favor of the salicylate plan of treatment, when the much more acute nature of cases subjected to this plan of treatment is borne in mind; but it is only what we should expect from the power the salicylate has of reducing the duration of the fever and of the pain."

In *The Lancet* of Dec. 31, 1881, p. 1119, Dr. D. W. C. Hood, of the West London Hospital, gives the analysis of 1,200 cases treated for acute rheumatism. In the course of the article he says: "I must ask you to refer to Dr. Fagge's table"—*The Lancet*, Dec. 17, 1881, p. 1030—"as a basis for comparison, my own salicylate table being simply complementary to his, and I think, as you will see, fully bearing out his statements."

In the same journal, p. 1120, Dr. J. K. Fowler, in comparing his experience at King's College Hospital in 1876, with that at Addenbrooke's Hospital in 1878-79, says: "I have been struck by the comparative absence of severe toxic symptoms at the latter, where the pure acid made from the oil of winter-green is exclusively used." * * * "The advantages claimed for the pure acid are that it rarely produces vomiting and never delirium; so that the treatment can be continued without the necessity of temporarily suspending the administration of the drug." * * He has submitted specimens of Kolbe's acid for examination, and says: "The analysis is not yet complete, but shows the presence of a considerable quantity of a substance not precipitated by nitrate of silver, and therefore not salicylic acid. This is not an isomeride of salicylic acid; nor is it carbolic acid. The investigation is of importance, as it may lead to improvements in the process of manufacture and the elimination of the substances causing the toxic symptoms."

In *The Lancet* of January 7, 1882, p. 9, Dr. Sidney Coupland's "contribution to this subject consists in an analysis of eighty-four cases of acute and subacute rheumatism treated with more or less rigour by salicylate of soda." His conclusions are given in *The Lancet* of January 14, 1882, p. 54. The deduction from his statistics with regard to relapse, is "that the withholding of the drug renders the patient more liable to pyrexial and articular relapses than if its administration be continued; but that the relapse may occur in spite of fairly considerable doses being given, as many occurring under doses of sixty grains and upwards for twenty-four hours, as under smaller doses." * * * "Lastly, before leaving this question of relapses, I should like to recall the fact that they may be promoted by a too early transition from a milk to a solid diet, or by too early getting up from bed. The readiness with which the salicylates subdue the fever and pain is liable to lead to too hasty changes in these respects, and therefore indirectly to relapse. I have no figures to bear this out, but I am certain that I have seen relapses occur under the use of the salicylate which one might fairly attribute to change of diet or abeyance of rest." * * "Salicylate of soda is certainly *anti-pyretic*, and, to a considerable degree, *anti-rheumatic*. That its employment does not appreciably diminish the time necessary to keep the patient at rest more than under other methods of treatment, but that the immense relief given by its use in the abatement of pain and fever—relief not to be estimated by statistics—renders it by far the most valuable remedy for the disease at present known."

In *The Lancet* of January 14, 1882, p. 57, Dr. T. J. Maclagan gives a general statistical statement of the results of the treatment of acute rheumatism in 39 of the large provincial hospitals of Great Britain. "The general results obtained in all these hospitals are quite in accordance with those got in the metropolitan hospitals * * *" Salicin was used in eleven of the thirty-nine hospitals; in two of the eleven it was used to the exclusion of the salicylates. "While the salicylates are frequently said to produce bad effects, not a single reference is made to any bad effects following salicin. In most cases the deleterious effects of the salicylates pass off with the omission of the drug; but to have to omit it is a serious drawback, for its early omission is most likely to be followed by a renewal of the rheumatic symptoms."

In the *British Medical Journal* of Jan. 14, 1882, p 46, Dr. P. W. Latham adds a note explanatory of his previous paper on salicylic acid as a specific in acute rheumatism. He summarizes: "The theory which I hold with regard to the pathology of acute rheumatism resolves itself into the following points: 1. A nervous centre exists, which controls the nutrition of the muscular and other tissues, and which has been termed the 'inhibitory chemical centre.' 2. The action of cold on some individuals, by lowering the power of this centre, modifies the nutrition of the tissues, and leads to the excessive formation of lactic acid and other products. 3. The presence of lactic acid in abnormal amount in the blood produces functional change in the medulla oblongata and the spinal cord (? posterior columns) when brought into contact with them, and developes the local symptoms of acute rheumatism in a manner similar to the production of the symptoms of locomotor ataxy, with its arthropathies, by organic change. 4. If the portion of the medulla in the neighbourhood of the origin of the vagus is a point of minimum energy, either hereditary or acquired, then, according to the particular fibres involved, may cardiac, pulmonary, or pleuritic complications be developed during an attack of rheumatism. 5. Salicylic acid combines with the antecedents of lactic acid, and so prevents its formation. 6. If the administration of the remedy be suspended after the symptoms are relieved, and before the 'inhibitory chemical centre' has recovered its tone, a relapse will certainly take place. Such a theory explains, moreover, the necessity for giving at the commencement, at least, of the treatment as much of the remedy as the system will bear. I hope before long to be able to prove, more conclusively than I did a year ago, the truth of these propositions, and to indicate more accurately the chemical changes which take place in the nutrition, and disintegration of muscular tissue. The object of my note, however, of December 10th, was not to raise a discussion on these points, but to suggest that the effects of the true and the artificial salicylic acids are not identical; and that where the head-symptoms have been alarming, or much gastric or intestinal irritation has been produced, or where the remedy has failed after the administration of a sufficiently large dose, to give relief, these results were due not to the true acid, but to that artificially prepared, and possibly more or less contaminated with carbolic acid, paraoxybenzoic acid or other impurities."

In *The Lancet* of January 28, 1882, p. 134, Dr. R. D. Powell expresses his disappointment in the fact that as yet we have "had no records of private practice." * * * * "Hospital records are greatly diminished in value with regard to a question like that of the salicyl treatment of rheumatism by the facts that, first, in a large proportion of the cases that come before us the attack is not a primary, but a second or a third attack, and it is probable that a considerable number of the cases tabulated should be regarded as *separate attacks* rather than separate cases. * * * Then, secondly, hospital patients have been ill for some days before coming under our treatment, and have been meanwhile subjected to various treatments, or have suffered from exposure and neglect of treatment. * * * And, thirdly, a large proportion of the cases both in primary and secondary attacks have already heart complication when admitted." Dr. Powell has "only met with toxic symptoms in the form of delirium or mania in three instances," and as all the cases were treated with salicylate of soda, he thinks "this shows that the complication was not due to impurity of preparation." He further adds: "The value of salicyl compounds in the treatment of rheumatism is well shown in cases outside the ordinary run of acute rheumatism, in which joint symptoms are absent or insignificant, and the disease manifests itself in other unlooked-for ways." He then gives two of his own cases corroborating this statement, and concludes his article: "These two cases are the most striking examples I have met with, but I have seen a goodly number of cases of other than joint rheumatism in which the salicylates have proved of value when other measures failed."

In the same journal, p. 135, important tabular statistics of cardiac complications prior to and subsequent to the introduction of the salicyl compounds are given by Dr. T. Gilbart-Smith of the London Hospital. He draws the following conclusion: "That, notwithstanding our expectations, based on the good effect of the salicyl compounds in several of the marked features of rheumatic fever, there is no evidence, so far as hospital statistics are concerned, to show that the introduccion of the salicylate treatment has led to any diminution in the amount of cardiac complication in acute rheumatism."

Lastly, in the same journal, p. 138, Dr. W. H. Broadbent, of St. Mary's Hospital, in summing up the discussion of the whole subject, says that he has not been able to determine exactly the numbers, "because the tabular statements have overlapped in some degree, but certainly more than a thousand cases of rheumatic fever treated by salicyl compounds have been under the consideration of the different speakers who have brought the matter before the Society." * * * And, "If facts can settle a question, then I consider that the value of the salicylic treatment of rheumatic fever may be considered as settled. * * * I think we may say definitely that by means of salicylic compounds the duration of the pain and fever in rheumatism is unmistakably lessened, and, even if the stay in hospital is not materially shortened, certainly the suffering is very greatly diminished. With regard to relapses, perhaps we may say that they seem to be more common under the new than under the old methods of treatment; still I am quite sure that the explanation of this is to be found in the rapidity with which all the acute symptoms subside under the administration of salicylates. * * * Over and over again I have gone to the bedside of a patient, who has just come out of acute rheumatism, and have found a stream of air pouring down upon the bed, in consequence of the zeal of sisters and nurses for ventilation; and to this fact I am quite certain that many relapses are due. * * * I am not aware that there have been brought forward any illustrations of bad effects which at all neutralize the good results that we have seen. * * * Turning now to another part of the subject, I myself do not – in spite of those most interesting, and of course accurate, tables which have been brought before us by Dr. Gilbart-Smith—believe that the salicylates increase the frequency of heart disease; on the contrary, I quite coincide with the hope and anticipation expressed by Dr. Fagge, in the early part of the discussion, that when salicylates are brought to bear upon the fever in the first days of its existence we shall see a notable diminution in the heart disease; for in my experience, during the whole administration of salicylates, it has been exceedingly rare to see heart disease springing up." He next adds, as a matter of great moment, that his "own very strong opinion is that it is not merely as dealing with fever that the salicylic compounds act. They have little influence over pyrexia due to other causes than rheumatism. In relieving the fever of typhoid, for example, they are not to be compared with quinine; and, indeed, my own experience of the salicylates in enteric fever has not been favorable. It appears to me that in some way or other the salicyl compounds antagonize the disease rheumatism, whatever it may be." He then concludes his remarks; "I will not enter now upon the discussion of the various hypotheses which have been advanced as to the nature and cause of rheumatism—that of Dr. Maclagan, for instance, or that of Dr. Latham. I must, however, express my dissent from Dr. Maclagan's theory, of its malarial origin and bacterial cause, which does not seem to fit in with all the facts in the history of acute rheumatism. Again, I cannot accept the existence of the special chemical co-ordinating centre of Dr. Latham, and therefore I am unable to receive his conclusions drawn therefrom. In saying this I do not mean to imply that I deny to the nervous system any share in the production of rheumatic fever. I object simply to the establishment of another of those centres which are postulated for anything of which we want an explanation."

LOCAL APPLICATION OF SALICYLATE OF SODA IN ACUTE RHEUMATISM.

In the *British Medical Journal* of Jan. 7, 1882, p. 11, Dr. Charles Orton alludes "to a severe case of polyarthritis acuta in a young lady aged 19, where joint after joint became red, swollen and exquisitely painful and tender." He tried "many local applications, besides internal remedies, without giving much relief," until he "applied lint soaked in a solution of salicylate of soda, under a cover of oil silk, to the affected joints. The relief was speedy and great." He has since tried it in a few cases in private practice with success, and is now using it more extensively, in cases under his care in the North Staffordshire Infirmary.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. MAY, 1882. No. 3.

THE NEW CODE OF MEDICAL ETHICS.

The history of the revolutionary action taken at the annual meeting of the Medical Society of the State of New York in February last, seems to be briefly as follows: A few prominent members have for some years past been dissatisfied with certain features of the Code of Ethics, and have occasionally tried in vain to get the subject before the Society for discussion. Other members have succeeded in preventing this, feeling that such discussions were often fruitless for good; and that when carried on with the enthusiasm likely to be aroused by such a subject, from the well-known differences of principle and opinion involved, it would be very likely to be fruitful in harm to the profession as represented in the Society.

President Bailey, in his inaugural address, *Transactions* of 1881, page 9, recommended that the "Code be materially revised, possibly a new one made." The committee on the President's address considered this recommendation and reported, see *Transactions* of 1881, p. 25, that it would not be competent or prudent then to make any radical propositions, but advised a special committee of five to be appointed by the President, "whose duty it shall be to consider the whole question of desirable changes in the Code, and who shall present to the Society, at the Session of 1882, such suggestions on this subject as their observations and investigations may direct."

This report and resolution were adopted, and at a later session the President announced as the special committee Drs. Wm. C. Wey, C. R. Agnew, S. O. Vander Poel, W. S. Ely and Henry G. Piffard.

At the first session of 1881, the New York County Society presented a resolution "that the Medical Society of this State be requested to revise the Code of Ethics by which the profession of this State are governed." This was subsequently, p. 30, referred to the Special Committee on the Code of Ethics.

Then at the annual meeting of 1882, this special committee reported, and the revolutionary action reported in the last number of the EPHEMERIS was taken.

Now, from this, it plainly appears that the whole profession of the State was duly notified a year in advance that this special committee would report on this important subject, and yet with a registry of over three hundred names, at this annual meeting only seventy were present when the whole profession was revolutionized by a vote of 52 against 18.

Whether this is to be taken as showing that the profession at large has but little interest in this subject, and therefore did not send communications or delegations to control any action that might be taken, or whether the matter was carelessly overlooked or neglected, cannot be known, but it is highly probable that action of a revolutionary character was not expected, and that it has taken a large and important proportion of the profession by surprise, and caused much dissatisfaction and regret.

One thing may certainly be taken for granted, and that is that no radical or unexpected action of fifty-two members out of a profession of more than 3,800 can be settled without an acquiescence of a majority of those represented in the action, and who are to be governed by it. Hence it is but fair and wise that some measures be taken to ascertain whether or not this action be acceptable to, or be acquiesced in by a majority of the profession represented in the State Society.

Therefore, in order to allow the whole profession an opportunity to express itself through its organizations and thus definitely settle this matter one way or the other, the following preamble and resolutions will be offered at the first session of the annual meeting of the State Society in February, 1883, and they are published now with the hope that all the county societies will take them up, and having discussed them freely and fully, will, by communications to the State Society through their delegations, pronounce definitely for or against repealing the action of this year. If any county societies be not heard from on the subject at all, of course it must be held that they approve of and acquiesce in the action; but it would be much better and more straightforward and manly to have the approval expressed. At any rate, the resolutions will give an opportunity to every county society and every permanent member to vote on one side or the other of the most important question which has come up in the profession for many years; and they will serve to remind all those who do not vote that their silence and inaction will be fairly construed into acquiescence, and make them morally responsible for any harm that may ensue.

WHEREAS, The Special Committee on the Code of Ethics, in its report at the last annual meeting, recommended a change in one part of the Code which was more in the nature of a revolution than of a revision, and therefore may be more radical than was expected or desired by the constituency of this Society; and

WHEREAS, That report was adopted at a session wherein only fifty-two members voted in the affirmative, and thus legislated for the entire profession of the State on a subject of vital importance in a direction which may not have been anticipated or desired by the profession at large;—

Therefore, for the purpose of bringing the matter before the whole profession of the State for more general and more deliberate action—

Be it Resolved, That all the action taken at the annual meeting of 1881, in regard to changing the Code of Ethics, be repealed, leaving the Code to stand as it was before such action was taken.

Resolved, That a new Special Committee of five be nominated by the Nominating Committee of the Society, and be appointed by the Society to review the Code of Ethics, and to report at the annual meeting of 1884 any changes in the Code that may be deemed advisable.

Resolved, That the report of this Committee be discussed at the meeting of 1884, and be then laid over for final action at the meeting of 1885.

Should this preamble and resolutions, after being freely published for consideration during the remainder of this year, and after being sent, as they will be, to the president of every county society of the State, be defeated as a whole when it is put to vote, then the action of this year will stand confirmed by the whole profession of the State, and it will be then definitely settled that the old Code of Ethics needed but little change, excepting that consultation with legally registered quacks of all kinds, which were before prohibited, should now be permitted.

If the preamble and resolutions should be admitted, the preamble would be adopted as a mere recital of the facts, and the test vote would be upon the first resolution. If that was defeated it would necessarily defeat all the others, and would be equivalent to rejecting the preamble and resolutions as a whole. But, should the first resolution be carried, it would leave the whole matter exactly where it was before the appointment of the special committee, and then the question would be upon the second resolution. If this should be defeated, the defeat would carry with it the third and dependent resolution, and the effect of this defeat would show that the society was satisfied with the old Code of Ethics, as it has stood for so many years; or at least would show that as yet it was not sufficiently dissatisfied with it to run the risk of making changes at present which might prove hurtful rather than beneficial.

If, however, the second resolution should be adopted it would raise a new committee having the same precept or duty as the previous special committee. But this new committee would be appointed in a very different way, and in a way very much more in harmony with so important a matter. The Nominating Committee of the Society being made up anew every year by the delegates and permanent members of each of the eight old senatorial districts of the State, meeting and selecting one of their number for this important committee, is necessarily a very fair aud impartial committee and comes afresh very directly from the constituency of the State Society. If this nominating committee of nine men fresh from all parts of the State should nominate this special committee just as they nominate the officers of the Society, and then if the Society should confirm or modify the special committee so nominated, then the committee would be a far better representative of the will and the wishes of the profession at large than if appointed, as the last one was, by the President of the Society.

Should the first and second resolutions be carried and the third one be defeated, then the Society would proceed at once to a final action on the report of the committee, and should there happen to be only a few members present the important result would be reached through the bias of a two-thirds vote of the few, and the matter would have to be undone, if afterward it did not meet the approval of the many.

But, if the third resolution should be carried, the subject could be discussed as freely as might be desired, and would then go over for a year, thus giving plenty of time for any amount of deliberation and writing, and would come up for final action before a new audience fresh from the total constituency of the Society. By this course a much larger proportion of the profession could think and act upon it with the chances for a much wiser decision. An effort was made at the last meeting to have the report of that special committee discussed and laid over for a year so as to come up for final action at the next annual meeting, but the motion was summarily defeated, and a final action was taken which careful deliberation does not sustain, and which probably could not have been taken in February next. This precipitate forcing through of an unexpected revolutionary measure by the mere power of six votes in a meeting of seventy votes, representing a constituency of over 3,800, is a kind of legislation always to be deplored, and which by its very precipitancy and urgency is far more likely to be wrong than right. The whole object of these resolutions is to ascertain whether in this particular instance of this kind, the action taken was wrong or right as judged by the profession to which it is thus arbitrarily applied.

The resolutions will be offered at the first session of the meeting of February, 1883, and the Society will be asked to appoint a special session for their consideration, so that all may be present who desire to be. The evening session of Tuesday was specially appointed for the subject at the last meeting.

And now a few words on the principles involved in this scheme for free consultations, and the principles may perhaps be best got at by parallel illustrations. There is a profession of the art of mechanical engineering which is based upon the operation of well-known scientific laws governing matter and its reciprocal relations; yet all the operations of all the natural laws are not either well known or well studied. That is to say, both the science and art of mechanical engineering are progressive. A large national population of steam engines are to be repaired from time to time, and kept in running order by this profession. In this profession there are Keely motor men who would do away with steam boilers, and substitute their little spheres—mere globules—of dynamic vapor. There are also perpetual motion men who make something out of nothing, and there are whole buildings in the Patent office filled with models of the visionary schemes of such men. Their quackeries bear very much the same relation to the principles of mechanical engineering that the quackeries of the so-called schools of medicine do to the regular profession of medicine. Do mechanical engineers want to consult Keely motor engineers, and if so, to what effect? The answer must be that conflict and confusion alone can be the result. What owner of a sick steam engine would desire or think of such consultations? Better have one or the other, but not both. Better have two of a kind, but not one of each, because if the machine is constructed upon certain principles it will not be made to run upon new ones by a consultation, and if any benefit comes of incongruous consultations it will not accrue to the machine, nor to the principles upon which it develops its power, nor to its owner, but possibly to the consultants.

In the theological profession are consultations ever heard of over the well or the sick or the dying in any such sense as is advocated in this scheme, or is there any interference or any charge of inhumanity in each denomination following its own tenets, yet where is there more general liberality than in intelligent theology?

In the profession of politics, and even in true political economy, such consultations are heard of, and they are generally based upon some variety of the principle of "mixed commissions," with an equal number of both kinds of political doctors on either side. The neat result of all such consultations has always been expressed in two words: "The spoils," and these again are to the consultants—not to the sick body politic. A little reflection can hardly fail to find such illustrations with more or less direct bearing upon the case under consideration, all through the economy of society, and why the absurdity and unwisdom of mixing incompatibles in the medical art is not as clearly seen as in any other art, is a great mystery.

A physician who believes in opposing the tendencies of disease by agencies which counteract such tendencies, can never get any help from consulting with one of directly opposite doctrine,—one who believes that like cures like. Neither can the latter get any help from the former. In any consultation between the two, one of the other, as the first step, must give up the principles upon which his practice is based. The patient cannot have the alleged benefits of both, because they are in antagonism, and therefore he can only have the benefit of one or the other, and these not through consultation, but through the opposite of consultation, namely, through independent action. This line of thought and action are very generally recognized in the treatment of general diseases, and there are few or none who have advocated incongruous consultations in ordinary routine medical practice. Each patient or family decides whom they will call, and they change as often as they please, whether it be to change the individual physician or the so-called system upon which they choose to depend, and it is noteworthy that this desire for inharmonious or antagonistic consultations does not come from the patient's side of the question at all, if there be intelligence enough to recognize principles in action. But coming as it does almost wholly from the physician's side, and from the comparatively few of those who pursue a consulting practice, it at once opens the question of why this should be. And the answer seems to be that the successful study of the diseases of special organs upon sound principles leading to one, and only one, indisputable and self-evident mode of practice is at the bottom of it all. The specialist is common to all the isms and pathys and quackeries of the day and of all time. His skill is the most cultivated and his successes are so definite and so easily seen that wherever a special organ is diseased it must go to him from whatever source, and he simply wants to receive these special diseases from any source whence they may be brought to him without violating the ethics of his profession, and without having the difficult and troublesome task forced upon him of finding out the ethical standing of those who bring their cases to him, or who call him to their cases. It is not the money he gets by it, for when successful he generally has plenty or does not care for it. His principles being sound, his practice is therefore successful, and his skill makes him an ardent student and almost necessarily an enthusiast. The diseased organs which he so well understands become the single aim of his life, and the anomalies in these diseases, and their difficulties, are his incitements to farther study and better skill. It is hardly wonderful, therefore, that he wants to clear away all obstacles that impede his progress by keeping his cases away from him and thus sacrificing the organs which he knows how to save. He nevertheless may be very wrong if he tries to break down the laws and barriers of the profession to which he belongs, and as an incidental but sure effect of this, the making common cause with error and unscrupulous want of principle. The consultations he gets are really no consultations at all. His patients are brought to him and he takes charge of them, but when brought to him by all sorts of anomalous practitioners, such practitioners must give them up, or he must refuse them. He neither wants to inquire who such practitioners are, nor to ask them to give up their patients, nor himself to refuse to take them when he sees them in need of his services. What is his remedy in this dilemma? Not to repeal the laws and break down the barriers of his already too lawless and over-crowded profession, but simply to treat all such cases freely and fully without pay. He does that already to thousands of cases in the hospitals and dispensaries throughout the land. Why not do it in a few more cases and keep his hands clean from the "mammon of unrighteousness?" Then the codes might stand and be as binding as possible, and his influence would be great to uphold and support them. Laws and restrictions may not be necessary to him, but they are for humanity in general, and he surely makes a great mistake when he sets his high order of intelligence to break them down on any such ground as has yet been taken in this most important discussion.

MEDICATION BY SALICYL COMPOUNDS.

The recent discussion by the Medical Society of London on the use of salicyl compounds in rheumatism, summarized in these pages, brings forward anew two or three important points, which it leaves unfinished. "More than a thousand cases of rheumatic fever" were treated with salicyl compounds, embracing salicin; salicylic acid made by Kolbe's process, from carbolic acid; salicylic acid made from oil of wintergreen, and salicylate of sodium made from Kolbe's salicylic acid. Toxic symptoms occurred in a considerable proportion of the cases treated with the Kolbe acid, and with salicylate of sodium made from that acid; but in the large number of cases reported by Dr. Fowler, of Cambridge, where the acid made from oil of wintergreen was used, these toxic symptoms were practically absent. This led to, or strengthened, the inference that there were impurities in the Kolbe acid, which produced these disagreeable symptoms. In *The Pharmaceutical Journal and Transactions* of April 6th, 1878, p. 785, Mr. John Williams, F. C. S., shows conclusively that there is, or was at that time, another acid occasionally or commonly present in the Kolbe acid to the extent of 15 to 25 per cent., and that this acid formed a contaminating sodium salt. In the subsequent discussion of the subject this acid and its sodium salt were very generally believed to be the source of the toxic symptoms.

The experience in this country has, in a desultory inexact way, confirmed this, although within this writer's observation it has been sometimes difficult to decide whether the toxic symptoms were due to over-dosing, or to the contaminating acid. As a rule salicyl compounds are rapidly eliminated, and, therefore, the effects are of comparatively short duration. This point has been too much overlooked in the use of these compounds, especially in Great Britain. It leads directly to the necessity for moderate doses frequently repeated. The English practice as deduced from the late discussion seems to have been to give from 60 to 180 grains in the twenty-four hours, divided into three or four doses, occasionally in six doses, and still more rarely in eight doses. In this country the best practice seems to have been in better conformity to the rate of elimination, for it is common to hear of its use every two hours, or every three hours—that is, twelve, or eight times in the twenty-four hours. The doses of either the acid or the sodium salt are perhaps usually twenty grains at first. Then fifteen grains until the pain begins to abate, and then ten grains or less, but always with frequent repetition. Such practice would indicate that somewhat less of the medicine is used in a given case, but in larger doses at first, and always more frequently repeated. The acid, however pure, is more apt to disturb the stomach primarily than the sodium salt, but in equivalent doses they seem equally liable to produce perversion of the special senses and delirium. Ringing in the ears seems to be for salicyl compounds, as for quinia, the indication of saturation, or of full physiological effect. Next comes disturbed or perverted vision, and finally delirium. If, as with quinia, the dose be reduced on the first appearance of ringing in the ears the other symtoms will not occur, and the medicine need not be suspended. The parallelism with quinia, strychnia, atropia, etc., is also noticeable in the circumstance that when the full physiological effect is reached, larger or more frequent doses are hurtful or toxic ; and of still more importance the circumstance that the full physiological effect is reached in different persons by widely different quantities. This latter consideration is so often neglected in therapeutics that the stated doses of medicines are not regarded simply as quantities to begin with, but are carried from patient to patient, and throughout case after case without regard to differences in individual susceptibility, and individual rates of elimination. If in two persons equally susceptible to a medicine—say salicyl compounds—the rate of elimination be different, either naturally or temporarily, the same full physiological dose will in one case be therapeutic only, while with slower elimination it will be cumulative until a toxic explosion occurs.

Hence in any consideration of the toxic effects of salicyl compounds, it is manifestly unsafe to charge them all to impurities in the medicine, when idosyncrasy brings into operation two other important causes of similar effects, namely, different susceptibility and different rate of elimination, under which conditions the moderate or small doses of one case become excessive in another.

While then it may be fairly assumed, that in a proportion of the cases when the medicine had to be suspended on account of toxic effects, these were due to over-dosing, yet still a very large proportion may be as fairly attributed to the contaminating acid.

In some rather roughly made observations on the subject, soon after Mr. Williams' paper was published, the writer came to the conclusion that the contaminating acid was most largely present in the amorphous acid, and that in well crystallized acid it was not present to the extent of more than six to eight per cent., and farther that sublimation freed the salicylic acid from this contaminating acid. Within the last two years, however, the markets have been supplied for those who chose to pay for it, with a well crystallized acid, which does not contain more than three or four per cent. of all impurities. Such an acid is all that can be needed for medical uses, and is quite as pure as any made from oil of wintergreen, and any toxic effects from such an acid, or from the sodium salt made from it, must be due either to idiosyncrasy or mismanagement. A well made sodium salt from such an acid is always white, but after being shut up long in a bottle, is liable to have a faint odor of carbolic acid. This, however, should be so faint as only to be perceptible on close examination, and should not be perceptible after exposure to the air for a time, nor in the solutions.

The salicylate of sodium having now pretty generally, and very properly superseded both salicin and salicylic acid for medicinal uses, it becomes quite important to know when it is of good quality. This is the more difficult because its appearance and sensible properties are no indication, and because any chemical examination or testing in order to be conclusive must be elaborate and troublesome. It is made by the careful saturation of a solution of a pure carbonate of sodium with good salicylic acid, and the evaporation of the solution to dryness by a carefully regulated heat, with constant stirring. The process, though not difficult, is tedious and troublesome, and, therefore, with the proper skill is rather expensive. The salt is never used in substance but always in solution, and, therefore, when redissolved all the trouble and expense of the drying process is lost.

Therefore, as salicylic acid is much more easily judged both by appearance and by tests than salicylate of sodium, and is much easier to get of assured quality, it is far better to save all risks of impurity and expense by making the solution for use as wanted. That is, each pharmacist or physician should make it for himself extemporaneously as wanted. Several formulas have been published by which to do this, but all have needed the detail necessary to those who might not be accustomed to such work.

Each 100 parts or grains of medicinal salicylate of sodium consists of about 89 of the acid and 11 of the sodium, both elements taken as hydrates, and the average dose of the salt to begin with, or to test the susceptibility of a patient with, is say 20 grains every two hours. The average case of acute rheumatism will, perhaps, require the use of the salicylate for say fifteen days, at an average of say 80 grains a day, or 1,200 grains in all, consisting of 1,070 grains of the acid and 130 grains of base. This is best made up by using an ounce bottle of salicylic acid at a time, about 2¼ ounces being needed to the average case. The ounce bottle of acid will contain about 437 grains, and this will require about 270 grains of bicarbonate of sodium, and will yield about 490 grains of the salicylate of sodium. A very convenient solution is one which contains 10 grains in each fluidrachm, and of such a solution one avoirdupois ounce of acid would make six fluidounces and one fluidrachm—say six fluidounces. This is easily and quickly made by the following formula:

Take of Salicylic Acid, well crystallized, 437 grains=28.32 grammes.
Bicarbonate of Sodium, 270 grains=17.5 grammes.
Water, free from iron, a sufficient quantity.

Put the acid into a vessel of the capacity of a pint, add four fluidounces=120 c.c. of water, stir well together and then add the bicarbonate of sodium in portions with stirring until the whole is added and the effervescence is finished. Filter the solution and wash the filter through with water until the filtered solution measures six fluidounces or one hundred and eighty cubic centimetres.

This solution contains 10 grains=0.65 grammes of the medicinal salicylate of sodium in each fluidrachm=3.75 c.c.

If made from good materials, the solution before filtration is of a pale amber color, but as most ordinary filtering paper contains traces of iron, the filtered solution is often of a deeper tint. Owing to the varying proportions of hygrometric moisture in the materials the solution may not always be perfectly neutral, but it must be very nearly so, and quite near enough for all practical purposes, as both elements are medicinal in the same direction. When the alkaline base is in excess, however, the solution soon becomes of a much deeper color. The carbonic acid (carbon dioxide) present in the solution is not only of no disadvantage, but is a positive advantage, since it improves the taste and renders the solution more acceptable to the stomach. It, however, interferes with the testing by litmus paper for the neutrality of the solution, unless the moistened paper, both blue and red, be exposed to the air a short time before judging of the coloration.

In this way an ounce of crystallized salicylic acid costing say 25 to 30 cents, and the bicarbonate of sodium costing less than one cent, will make about 480 grains=31.1 grammes, or 1.1 avoirdupois ounces of the salicylate, and any physician or pharamacist can make the solution.

In common with other bitter and nauseous salines it is best taken simply diluted with ice water. A mouthful or two of ice water before and after the dose to blunt the sense of taste, and the dose between them in the proportion of about two fluidrachms of the solution in a wine-glass full of ice water, renders it easily taken by most persons. In acute cases it should be taken every two hours at first, or in urgent cases every hour, until very moderate saturation occurs. Then the dose should be diminished before the intervals are lengthened, and finally the intervals should be lengthened first to three hours, and then to four hours, but it should not be omitted until the usual time and risks of relapse are past. In chronic cases one fluidrachm of the solution every two or three hours during two or three days will probably do all that the medicine is capable of, if the patient have the ordinary susceptibility, but it cannot fairly be said to have failed until the full physiological effects have been obtained without abatement of the symptoms.

See corrected process - Page 105

ASSAYS OF CINCHONA.

Many very good methods of assaying cinchona barks have been published, but all are complicated and troublesome and often tedious. Sometimes this is due to the complication of the process, but oftener to the attempts to reach a higher degree of accuracy than is needed for the ordinary valuation of the barks. The quinia manufacturer will in three or four hours reach a valuation of any sample of bark with sufficient accuracy for his uses in buying. But he does not communicate his process, and leaves the pharmacist to the published processes which commonly require a day or two, and a considerable amount of skill in manipulation. In searching for a more simple and easy process, which would come within the scope of the numerous class of physicians and pharmacists who are especially interested in the cinchonas, the writer thinks he has found a method by which a fairly close approximation of the total alkaloids contained in any cinchona may be reached easily and in a comparatively short time. Several of the features of the process have been long well known and used, but others are, so far as known, original with the writer. The process is susceptible of a considerable degree of accuracy, but as given here it only aims at a moderately close valuation of the barks. The part of the process given in this note is only for the estimation of the total alkaloids, the more difficult undertaking of estimating the quinia and quinidia, or ether-soluble alkaloids, will be treated of in a subsequent note.

The cinchona to be essayed should be in the ordinary fine powder of the common market—the finer the better, and as it is about as easy to make two or three assays at a time as one, it is better to have duplicates at least.

The reactions upon which the method of assay is based, are that amylic alcohol freely dissolves all the alkaloids of cinchona barks, but does not dissolve the salts of these alkaloids, and that it dissolves much less of the coloring matter than other solvents; and the outline of the method is to break up the natural salts of the alkaloids in the bark, and fix the coloring matters by lime in excess. Then to extract the free alkaloids with amylic alcohol, ether being added to facilitate the percolation and filtration. Then to convert the alkaloids into salts, and thus get them out of the amylic alcohol into a watery solution. Then to precipitate them from the watery solution in the presence of chloroform which dissolves them freely, and finally to evaporate off the chloroform and weigh the residue as anhydrous alkaloids.

Take of the powdered Cinchona	5 grammes	=77.16 grains.
Lime, well burnt,	1.25 "	=19.29 "
Amylic Alcohol,		
Stronger Ether,		

Purified Chloroform,
Normal Solution of Oxalic Acid,
Normal Solution of Sodium and
Water of each a sufficient quantity.

Add to the lime, in a 10 c.m.=4 inch capsule, 15 c.c.=half a fluidounce of hot water and when the lime is slaked add the powdered cinchona; stir them well together, rinse off the stirrer into the capsule with a little water, and then dry the mixture in a water bath. Rub the dried mixture into powder in the capsule with the end of a spatula, and then transfer the mixture to a flask of 100 c.c.=3.3 fluidounces capacity, and add to it 15 c.c. =half a fluidounce of amylic alcohol. Cork the flask and digest in a water bath at a boiling temperature, with occasional shaking for half an hour, then cool and add 60 c.c.=2 fluidounces of stronger ether and shake vigorously and frequently during half an hour. Filter off the liquid through a double filter of 10 c.m.=4 inches diameter, keeping the funnel covered with a watch glass, and having transferred the residue from the flask to the filter, and rinsed out the flask with 6 c.c.=96 minims of a mixture of 10 volumes of amylic alcohol to 40 of stronger ether, wash the residue and the filter with 30 c.c.=1 fluidounce of the same mixture applied from a pipette drop by drop to the edges of the filter and surface of the residue in it. Evaporate the liquid in a tared capsule of 10 c.m.=4 inches diameter, in an air bath to 10 grammes=154 grains, and then transfer it to a flask of 100 c.c.=3.3 fluidounces capacity, rinsing the capsule into the flask with 5 c.c.=80 minims of amylic alcohol. Then add 4 c.c.=64 minims of normal solution of oxalic acid, shake vigorously and frequently during 15 minutes, and while still intimately mixed by the shaking pour the mixture onto a double filter well wetted with water, and filter off the watery portion into a tared capsule. When the acid solution has passed through and the amylic alcohol remains on the filter, wash the filter and contents with 5 c.c.=80 minims of water applied drop by drop to the edges of the filter and surface of the amylic alcohol. Then pour the amylic alcohol back into the flask over the edge of the filter and funnel, rinsing the last portion in with a few drops of water. Add 1 c.c.=16 minims more of normal solution of oxalic acid and 5 c.c.=80 minims of water and again shake vigorously for a minute or two, and return the whole to the filter. When the acid solution has passed through into the capsule, return the amylic alcohol to the flask, add 10 c.c.=·33 fluidounce of water, again shake vigorously and again return to the filter as before. Repeat this a third time, and finally, when the washings are all through, wash the filter and surface of the amylic alcohol with 5 c.c.= 80 minims of water applied drop by drop. Evaporate the acid solution and washings on a water bath to 30 grammes=463 grains, and transfer the remainder to a flask of 100 c.c.=3.3 fluidounces capacity, rinsing the capsule into the flask with a few drops of water. Add 20 c.c.=·66 fluidounce of purified chloroform, and then 5.1 c.c.=81.5 minims of normal solution of sodium and shake vigorously for a few minutes. While still intimately mixed by the shaking pour the mixture upon a filter well wetted with water. When the watery solution has all passed through, leaving the chloroform in the filter, wash the filter and chloroform with 5 c.c.=80 minims of water applied drop by drop. Transfer the chloroform, by making a pin-hole in the point of the filter, to a small filter well wetted with chloroform, filter it into a small tared capsule, and rinse the filter through into the capsule with 5 c.c.=80 minims of chloroform. Evaporate this to dryness on a water bath and weigh. The weight of this residue, multiplied by 20, gives the percentage of total alkaloids of the bark in an anhydrous condition, within ·1 or ·2 of a per cent. if the process be well managed.

The object of stirring the powdered bark into the slaked lime and water while hot is to swell and permeate the particles as rapidly as possible, introducing the lime solution into the innermost parts of the particles, and this process goes on during the drying of the mixture. Besides setting the alkaloids free from their natural combinations in the bark, the excess of lime so combines with and fixes the coloring matters, that even with the red cinchonas the subsequent steps of the process are not confused or obstructed by coloring matter. Various other precipitants were tried, as sodium and ammonium, with and without alcohol, but none answered so well as lime. The digestion and shaking with amylic alcohol doubtless dissolves all the alkaloids present, and dissolves very little beside, but a portion of the solution remains absorbed by the spongy structure of the particles. Such portions can be percolated out on a filter with amylic alcohol, but the filtration is very tedious and troublesome, requiring more than a day. But by diluting the amylic alcohol with four times its volume of stronger ether it is rendered very manageable, and the filtration and washings are accomplished in about an hour, leaving the residue practically exhausted. If this solution be evaporated either spontaneously or by a water bath it creeps over the edges of the capsule badly and no good result can be reached. But if evaporated in a hot-air bath as directed, or in any way that the sides and edges of the capsule may be kept hot, this creeping does not occur. An ordinary water bath without water, the capsule being set in on a block of wood, answers a very good purpose, because the scorching of the wood will be a good indicator, if the heat gets too high. In this part of the process care must be taken that the ether vapor does not take fire. When evaporated to 10 grammes as ascertained by trying on a scale from time to time, the ether is nearly all gone and a solution of the alkaloids in amylic alcohol remains. One prominent object of the next step of the process—namely, the washing out of the alkaloids from the amylic alcohol as oxalates—is to free them from waxy and fatty matters always extracted from the bark by all solvents which effect a complete exhaustion. In washing out the alkaloids these waxy and fatty matters are left in solution in the amylic alcohol, and with it are thrown away. As the salts of the alkaloids are not soluble in amylic alcohol, a definite quantity of solution of oxalic acid being added, the alkaloids are washed out of the amylic alcohol as acid oxalates. But they are rather difficult to wash out completely, and hence three washings are directed. If close results are not needed, two washings are sufficient. In pouring the amylic alcohol back from the filter into the flask, over the edge of the filter and funnel, a little dexterity is required, and the rim of the funnel must always be somewhat above the filter in order to be quite successful. The double filter well wetted with water, and kept well wetted, retains the amylic alcohol very well, while the watery solution drains off to the last drop. But should there be any minute holes in the paper, or should the paper not be kept well wetted, a very little of the amylic alcohol may get through, but if so, it does not matter, for it will go off with the vapor in the subsequent evaporation. The solution of the oxalates is too dilute for precipitation, and as it is not acid enough to injure the alkaloids by heat, it is evaporated to 30 grammes. As this solution has no tendency to creep, the evaporation is best done on a water-bath. In the next step the alkaloids are precipitated in the presence of chloroform, and it makes a very notable difference in the result if commercial or impure chloroform be used, hence purified chloroform is directed. Having used in all 5 c.c. of normal solution of oxalic acid in converting the alkaloids into acid oxalates, it is only necessary now to add 5.1 c.c. of normal solution of sodium in order to be sure that the precipitation is complete to an alkaline reaction, yet without a sufficient excess of sodium to hold the alkaloids from the chloroform, and hence the use of these normal solutions is important as well as very convenient. After a thorough shaking, the now free alkaloids are all dissolved in the chloroform, and it is only necessary to separate this completely in order to get them all. Here again a wet filter becomes a most complete and convenient mode of separation. The watery solution of oxalate of sodium goes through to the last drop, but not a particle of chloroform passes if the paper be good, and here a double filter is not needed ; neither is it necessary to wash the filter very much. In the chloroform separation of the alkaloids a film of impurities, soluble in neither liquid, is apt to be present between the two liquids. This is often hardly a weighable quantity, and when small may be neglected and the chloroform solution be at once transferred to the tared capsule for evaporation. But in close estimates it is easily separated in the way prescribed by filtration of the chloroform solution through a chloroform-wetted filter into the capsule. This chloroform-wetted filter not only excludes these impurities, but also any water that may drain out of the water-wetted filter. A pin-hole made in the point of the water-wetted filter is a very good way of transferring from one filter to the other. As the chloroform solution has no tendency to creep it may be quickly evaporated on a water bath, leaving the alkaloids of a light brown color and very easily brought to a constant weight.

For a very rough estimation of the value of cinchona bark, the amylic alcohol solution, directly from the lime and bark, may be evaporated to dryness, but it creeps badly and is very difficult to dry to a constant weight, giving results which are too high. Such an estimation may be made in about three hours, and with a set of ascertained corrections to apply may often be very useful where many samples have to be examined in a short time, and with a low degree of accuracy.

The more elaborate process, as above given, requires nearly a day for satisfactory completion, and after a little experience with it, it becomes very convenient and trustworthy.

In the investigations made for the purposes of this paper some points are deserving of mention to save others from going over the same ground. Ordinary ethylic alcohol is an excellent solvent for the alkaloids, especially at a boiling temperature, and dissolves them either in their natural combinations, or when set free by lime or sodium, and in the use of it the powder well soaked with either hot water, or sodium solution, or lime solution, need not be dried before the alcohol is applied. But the alcohol extracts so much coloring matter and other constitutents of the bark that are not desirable that its use is inferior to amylic alcohol. Strong ether alone applied to the dried mixture with lime, is an excellent solvent under pressure and with heat, but it is inconvenient and may be dangerous under the needed pressure, while in the cold it requires so large a quantity of the solvent as to overcome its other advantages. The alkaloids equally require to be washed out from ether, since it dissolves quite as much wax and fat from the bark as do other solvents.

OPIUM ASSAYS.

It has been suggested that the information given in the Ephemeris upon Opium and Opium assays would be rendered more complete by some account of the higher and lower grades with which the New York market is supplied. From the facts shown in the previous notes it will be seen that except in rare instances where the inspectors at the Custom House are deceived, no Opium comes into this market containing less than 9 per cent. of morphia, and that if 9 per cent. Opium be dried and powdered it will yield a powder containing about 11.25 per cent. of morphia. Hence this is probably the lowest grade of Opium which is honestly supplied to the market, while perhaps four-fifths of the total supply is considerably above this. But it is generally, though somewhat indefinitely known that any reasonable quantity of powdered Opium may be had of a much lower quality. If this be true, —and it can hardly be doubted—it is equally true that any buyer who chooses to do so, can easily avoid these low grades, at least so far as this market is concerned, for they are produced by direct adulteration in powdering, and it is easy to avoid the channels through which such drugs are reached. Not so, however, with other markets all over the country which are supplied from this market, because, as these supplies are too often governed entirely by price, the lowest price will usually sell the goods. It is very easy to see from known facts in regard to this article, how the large, distant inland cities can compete with the sea-board market in drugs. Suppose that a 9 per cent. Opium be adulterated in powdering only just enough to pay for the transportation and risks—and this would be a very mild adulteration indeed, and one that would require a careful assay to detect—the powder could be sold in a distant city at the same price and with the same profit which the same Opium would yield if sold unadulterated at the sea-board. Such practices are extremely difficult to detect, and still harder to prove, but if they be not carried on to a very considerable extent the general indications of them are very delusive, and the business instincts and enterprises of the age are not to be trusted. It is not, however, to be inferred that good powdered Opium cannot be had in distant cities; and that by all buyers who really want it, but only that it cannot be had at less than sea-board prices plus the cost and risk of transportation. And farther, when Opium or any other foreign drug, either powdered or not, is offered in distant cities at sea-board prices, without cost of transportation, etc., it is about as safe an evidence of adulteration or inferior quality as any ordinary assay would be. No one can sell drugs without profit; and now-a-days buyers are pretty much all upon the same basis as to opportunity, no one buyer having cheaper sources of supply than all others, quality being equal. But ascertained quality being set aside, statements and appearances being depended on, and price being made the primary consideration after statements and appearances have been accepted, then some dealers can buy much "better," that is, more cheaply, or at lower prices than others. Thus, if 11.25 per cent. of morphia be the poorest Opium that can be admitted into this country (9 per cent. in the moist condition), then any powdered Opium found that is below that strength must be adulterated in powdering, and if such Opium be wanted, and be sought for, it can always be found at prices correspondingly low. Yet it must be sought for actively and in the direct interests of pecuniary gain, and the buyer who seeks it must be known, and known to want it in the regular channels of trade, as "very close buyers" are known to want cheap articles for large profits. Hence any one who wants low priced powdered Opium for examination with any chance of the results being reported, is not likely to be able to find it. This has been found to be one of the greatest obstacles in carrying out adulteration laws in other countries. One officer finds but little to complain of. All his samples on examination, both of food and medicine, are of very fair quality, and his reports are, therefore, favorable. Another officer, who has taken more pains and better means to get his samples, finds his reports less favorable, while another who adopts a sharp well-managed detective system, often succeeds in finding a very different set of samples, and upon them makes a fairer representation of this branch of trade. The writer has no means of reaching this branch of trade in powdered Opium here, nor is it easily reached for such purposes as he now has in view by any one, and the nearer to the source of the adulteration the more difficult is the undertaking. All that could be done was to send to four houses known to be engaged in a pretty sharp competition for the cheaper trade of the market and buy samples of powdered Opium for dispensing uses. One house sold at 55c. per avoirdupois ounce. Two others at 50c. and the fourth at 45c. This is at the rate of $8.80, $8.00 and $7.20 per pound, all of which are fair prices, and afford a fair profit on a fair quality. These samples when assayed gave respectively, and in the order just named for price, 11.4, 12.2, 13.4, and 13.6 per cent. of morphia, the average being 12.6 per cent. These were, therefore, all made from moist Opium which contained over 9 per cent. The average of these samples is but 0.9 per cent. below the average (13.52 per cent.) of eight samples as given in a former note, which samples came from sources estimated as supplying 75 to 80 per cent. of the powdered Opium sold to dispensing stores in the neighborhood of New York. Therefore, this powdered Opium by its inferior morphia strength was just 43c. per pound dearer than the average of the better sources of the market. By this it would appear that no powdered Opium can be easily had in this market containing less than 9.5 per cent. of morphia (see previous note), and this the only instance out of twelve that was manifestly adulterated, and the only one which when calculated back to the moist condition represented an Opium of less than 9 per cent.

The higher grades of Opium which come into this market under various names, and which can always be easily had when wanted, are really the cheapest Opiums that are sold, as they are very commonly offered at 25 to 50c. per pound above the ordinary market price. The assay of 16 cases of these Opiums of higher quality give an average of just 16 per cent. of morphia, which is about equal to 13 per cent. in the moist Opium. This in all probability is the Opium upon which the doses of the older standard authorities are based.

If powdered Opium containing 14 per cent. of morphia be sold at $8.00 per pound, one containing 16 per cent. is worth $9.00, while the latter in its moist commercial condition costs only 25c. to 50c. per pound more than the former.

An assay of two cases of Salonica Opium, of the crop of 1880, has been made since this note was commenced. The Opium was assayed in the moist commercial condition by the process given in a former number of the EPHEMERIS. From being "Old Opium," the lumps were dryer and harder than usual, although kept in the original tin cases, and probably in a cellar, as is the common usage.

The results of the assays were as follows:

		Morphia.	Water.	Residue.
Case No. 1,		14.34	18.11	34.0 per cent.
	or	17.51 per cent. if calculated to powdered Opium.		
		Morphia.	Water.	Residue.
Case No. 2,		16.78	17.23	27 33 per cent.
	or	20.27 per cent. if calculated to powdered Opium.		

As the morphia from these assays was more colored than usual, the results may be a little too high.

ARTIFICIAL QUINIA.

It is announced in a recent number of the Comptes Réndus of the French Academy, that Mr. E. J. Maumené has succeeded in the synthesis of quinia by a simple and easy process, and that he has deposited with the Academy a sealed package, describing his process and containing a specimen of the artificial alkaloid. Therapeutic experiments with the artificial substance are still unfinished, but very soon the alleged discoverer will publish detailed statements and evidences of his results.

The result here announced has long been considered as so probable that time and research were alone necessary to its ultimate accomplishment, and the number of artificial alkaloids has been steadily increasing now for several years. But no substance of any thing like the importance of quinia has as yet been made, though much time and labor has been given to it. A similar announcement to this was made some time ago, but so far has been fruitless, and whether this one will reach any more practical results time alone will show. Many of these announcements with sealed packages are made to the Academy which are never afterward heard from, so the makers of quinia from cinchona barks need not yet give up their manufactories in despair, although they may believe, with the chemists, that the discovery is only a question of time.

FACTITIOUS JALAP.

A short time since, the writer received several samples of what was offered for entry at the Custom House as Jalap. The substance had somewhat the appearance of Jalap, and was evidently prepared with some pains and care to imitate that drug. On closer examination, however, the larger pieces were found to be a dried and compressed saccharine fruit. Other pieces were roots, having the appearance of false Jalap, but not a single tuber or part of a tuber of true Jalap could be found in any of the samples. Were it not for the inspectors of drugs, such articles would come freely into the markets, and soon be converted into medicinal powders, extracts, etc.

COPAIBA.

The writer has recently had occasion to examine four samples from large parcels of Copaiba, the appearance of which was very much against its quality in every sample, and its quality was disputed. It gave no evidences of any of the ordinary adulterations of this article, but simply appeared to be of very poor quality. In such cases there is only one way of deciding upon the quality, and that is by distilling off the oil in order to get its proportion, the oil being the active principle of the drug. The best authorities state that Copaiba should contain 40 to 60 per cent. of oil, and it is the chief object of this note to record the results of these examinations. It does not distill easily in a glass vessel, and the operator will lose his time and apparatus in trying it. It should be distilled in a small metal still, first with ten times its volume of water, and then twice successively with five times its volume. The oil is carefully separated from the water of the distillate and weighed.

A sample of good Para Copaiba was examined for a standard of comparison. This gave 56.1 per cent. of oil. The four doubtful samples gave, respectively, 46.2, 51.5, 40.5, and 43.5 per cent. of oil.

Therefore all these samples, though of very doubtful appearance, were within the range of quality, as given in the best authorities.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. JULY, 1882. No. 4.

MODERN THERAPEUTICS.

The convergence of the natural sciences upon the condition of civilized mankind constitutes the science of medicine, and this has for its main object the art of medicine; and this art of medicine naturally is divided into hygiene or preventive medicine and therapeutics. Therefore, practically, and from a utilitarian point of view, therapeutics is the art of medicine, as Trousseau has well said.

Therapeutics is eminently a progressive art; and its progress depends upon the extent of the knowledge of disease, and the accuracy of the observations through which disease may be modified or controlled. These conditions, being very variable in quantity and quality, give to therapeutics what often seems to be a very uncertain standing as it follows more or less closely upon more or less extensive knowledge and more or less accurate observation to make up the experience upon which it is based. Hence it is that modern therapeutics may be usefully divided into three kinds, which run insensibly into each other, but whose broadest distinction is to be found in the value they give to drugs.

A very large proportion of the profession seem so dissatisfied with their knowledge or skill, or with the results of their application of these, that they are in restless search for new drugs which are to be tried in order to find specifics. The therapeutic knowledge of this part of the profession is accepted from the ingenious and plausible drummer who leaves it with his samples for trial,—or from the flood of advertising papers, statements, certificates and cases published in this interest. In this spirit of empiricism everything seems worth a trial; or, rather, the only reasoning that is accepted is that every new thing should be tried, in order that there be no risk of missing a valuable agent. To this class nothing seems absurd, nothing incredible, and it therefore becomes an easy prey to mercantile enterprise.

Another class consists of the altogether incredulous. Drugs and the experience upon which their action and uses are based, are together rejected, and the natural recuperative tendencies alone are trusted. A very few agents to relieve some of the expressions of diseased action is all they need or will accept, and the claim is that this alone is rational medicine. This class is not large, and is, perhaps, smaller than it would be if more accessible to professional or mercantile enterprise.

Fortunately, however, there is an intermediate class ready to apply the accurate methods of observation and research to the positions assumed by the other classes. These are supported by a principle of action which is based upon the corrected and recorrected observations and experience of the past. Their agents are not tried one after another in an empirical way, nor because they are new and well advertised, nor are they rejected because their action cannot be mathematically demonstrated, but they are used as definite means to definite ends, just as mechanical means are used to obtain mechanical results. The ultimate source of power or mode of action may be as little known as is the mechanical origin of life itself, whilst the operations and reactions may have been as well studied, and, therefore, be as well known, as those of mechanics or of chemistry.

The great advances made in therapeutics within the past ten years are well shown in the modified acceptation of the word "cure." No thoughtful physician who watches the progress and the leading of modern experience and investigation, and who properly sifts the results, will talk much of curing in the old acceptation of the idea; and one who does look upon diseases as specific entities to be cured by specific drugs—or, one who believes in specifics—at once places himself and his art upon a very low level, and his name is soon found among the multitude who certify to the novelties and fashions of the day in the almost universal drugging that now prevails. The doctrine involved in the idea that this is pneumonia and that is the drug which cures it, and, if not cured, that some new drug must be tried, must still long hold a diminishing ground among the masses, both professional and lay, but with the more intelligent, reading and thinking physician of the time it is a doctrine of the past. The popular hold upon it is doubtless very strong, and will long be supported by the collateral money making interests involved in it, but slowly or rapidly it must die out.

If it could be promptly and generally recognized that the laws of health were as certain in their nature and operation as the laws of gravity, or any other physical laws, and that disease was mainly an expression of some violation of these laws, very much would be gained, because this is the true principle which underlies the whole medical art, and it would soon be practically realized that whatever does not accord with this underlying principle must be wrong. But suppose another step could be taken, and diseases, as simple violations of the laws of life and health, could be regarded, as they are, as mere loose combinations or groups of erratic or disturbing phenomena called symptoms, simple or complex, in proportion to the violation of law which they express, and named for mere convenience sake from the frequency with which certain prominent phenomena occur together or succeed each other, then another great gain would follow, for it would be easily seen that to return to the laws of health, and restore their operations, would constitute the only rational art of medicine. And if a rational art of medicine be clearly recognized, the irrationality of applying a drug to mend a broken or perverted law would be as clearly seen, and the irrational and hurtful part of the universal system of popular drugging would cease. The newspapers and journals would display their headings and publish their certificates of cures in vain. All these enormous sums of advertising money would be lost to them, and be gained or saved to the community at large; where, if expended in better food, better exercise, better dwellings and better clothing—or, in other words, in supporting and obeying, instead of violating the laws of life and health—the beneficent results would soon be apparent.

And yet hygiene and preventive medicine can never arrest the progress of therapeutics; much less can they ever render therapeutics unimportant or unnecessary. Diseases are, most of them, of the nature of injuries and accidents, and, as such, must always occur, and must demand some system of therapeutics acting through external counteracting agents, and the more rational and the more definite the system the better for mankind.

THE NEWSPAPERS AND THE NEW CODE OF ETHICS.

The newspapers, as representatives of intelligent public opinion, have had much to say upon the new code of medical ethics, and it has been almost all said on one narrow side of the question, and through misapprehension they have not done full justice to either side of the controversy. If they be the makers and leaders of public opinion, then in this case, at least, they have not taken the trouble to fully comprehend the issue, and in this "doctors' squabble," as they sometimes call it, have failed to recognize it as a matter of very grave public interest.

In ordinary topics of similar importance, the newspapers are generally found to take different and opposing views, and thus all sides of the subject are presented, and the danger of misleading the public is diminished. Again, most subjects are discussed by them upon some underlying principle, but here a most superficial view has been taken, and the assumed leading points have not been those of the true issue.

The following article, from the editorial columns of "The New York Evening Post," of June 9th, is reproduced here as a favorable example of what has been editorially written upon the subject, with unintentional though with a maximum ability to mislead; and it, perhaps, fairly shows the position taken in behalf of the lay public in regard to the profession of medicine in general, although the article is written from an exclusively homœopathic point of view.

The position taken appears to be that all who pretend to cure disease belong to the general profession, and that it is a mere matter of individual liberty to choose between the individuals of a general profession just as in the choice of a lawyer. No distinctive fundamental principles are recognized in medicine as in the sciences, law, theology, etc., but all seems to be regarded as hap-hazard empiricism wherein there should be absolute freedom of choice as to which empiric should be selected, and absolute equality and fraternity between all the empirics, quite independent of any underlying principles of action.

A reply to the above-mentioned article, by this writer, in which an attempt was made to correct some of the misapprehensions, was published by the "Post," on the first page of its issue, of June 30, with a paragraph of editorial comment. These are also reproduced here, in order that the articles may be read together for whatever influence they may have toward a correct understanding of the subject.

[From the "Evening Post" of June 9, 1882.]

DOCTOR AND PATIENT.

The action of the American Medical Convention, at St. Paul, in excluding the New York delegates, seems to have been from a professional point of view unavoidable. The New York State Medical Society had at its meeting in last February passed a vote permitting practitioners of the "regular" school to hold consultations with homœopathists. This vote was in conflict with the rules of the American Society, which had nothing to do but to punish the New York branch for its violation of them.

The action of the Association will probably lead to a new discussion of the matter in the New York Society, its action in February being regarded by its members as by no means conclusive. The view taken of the matter by the physicians who support the "code of ethics," as stated by one of them in an interview this morning, is that "no possible good could result from consultations in which there could by no possibility be an agreement;" and that "so long as they (the homœopaths) insist on the dogma that like cures like, we cannot but regard them as irregular, and no member of the regular profession can with dignity recognize them."

Now, if it could be proved in any way that it was true that "no good" could come of any such consultations, the position of the regular practitioners would not be worth disputing about. But it can only be true if homœopathic practice can be shown to be pure quackery. If homœopaths are mere quacks, who practice upon the credulity of the public, like astrologers or "weather prophets," then the regular physicians are performing a public service by discrediting them in every way that they can, and it is not merely undignified, but dishonest to consult with them.

But the homœopaths are not in this position at all. They constitute an important and growing branch of the medical profession. They have obtained legal recognition for their chartered institutions, and they have plenty of them. There are some 8,000 homœopathic physicians in the United States, and a dozen homœopathic colleges, turning out a couple of hundred new physicians every year. There are, of course, no statistics to show how many families or individuals are dependent upon this body for medical advice and care, but it embraces a very considerable proportion of the population, whom it would be appalling and absurd, too, to think of as given over entirely to the care of quacks and cheats.

The fact is that medical science is not in a condition which entitles any one to say that the profession of a particular dogma like that of the homœopaths makes him an impostor. What little is known about the effect of drugs upon the human body is the result of experiment, and the homœopath deduces his "dogma" from experience, just as the regular practitioner does his belief that there is nothing in it. As to which is right and which is wrong, the layman is usually profoundly ignorant, and it must be remembered that the layman's experience of medicine usually inclines him to be very skeptical on this subject. Every one sees so many mistakes continually made both in diagnosis and treatment that he cannot but recognize the fact that mere "regularity" of dogmatic opinion with regard to disease or the *materia medica* is very far from insuring success, and that in nine cases out of ten what makes a man a good doctor is not only science but natural aptitude and individual experience.

We have the medical profession thus divided into two bodies, both of which believe equally in the importance of professional training, and the possibility of treating disease according to rules derived from experience; both of which possess a high degree of skill, training and education. They differ as to a dogma, of the truth of which laymen have hardly any means of judging. Few laymen who go for advice to a doctor who maintains the truth of this dogma do so because they care anything about the dogma; they do so simply because they think him a good doctor, and find that he brings them and their wives and children through their various ailments with success. Frequently, however, they find that even a good doctor's skill is baffled, and then very likely they would like to call in another good doctor, of what is to them simply a rival "school." But now they find themselves confronted with a strict rule that the two cannot consult, because one of them believes that diseases should be treated by drugs whose effects, tested on the body in health, are similar to the symptoms present in disease. The layman wants to call them in because they belong to different schools, and he wants to have the benefit of the difference, but for this very reason he cannot get them.

The physicians ought, in any future discussion of the question, to take into account, more than they are usually willing to do, the layman's view of the subject. To him the rule forbidding the regular practitioner to consult with a homœopath simply means that he is cut off by a dispute which he cares little about from getting all the available experience and advice within reach on what may be a matter of life and death. He does not regard, and can never be brought to regard, a highly educated and trained physician as a "quack" merely because of a difference between him and his rival round the corner on a recondite matter like that which divides homœopaths from allopaths, and, therefore, he looks upon the rule as mere piece of superstition. The enormous growth of the homœopathic body in the last fifty years shows that the rule does not prevent what the regulars regard as medical error from spreading, and if the rule does not prevent this, would its abrogation be attended by any very dreadful consequences? If a regular physician sees that "no good" can result from a consultation because no agreement is possible, he will no doubt always withdraw of himself; and so will a homœopath. If either thinks his "dignity" compromised by the meeting, he will not come to it. Will it do any harm to humor the layman a little in the matter?

Reply to the above from the "Evening Post" of June 30, 1882:

DOCTOR AND PATIENT.

To the Editor of the Evening Post:

SIR—The editorial article under the above caption in your paper of June 9 is, for this discussion, so temperate that you may excuse a desire to go a little more deeply into the subject on its popular side and test some of your conclusions, because the root of the matter is not understood by the public, although the subject is one of grave public interest.

The advocates of the new code of ethics do not desire to consult with homœopathists especially, or more than with eclectics, hydropathists, and the numerous other sects, but do desire to have freedom from any restraint whatever in consultations; and they desire this freedom, first, on the ground of humanity, liberality and charity; and, secondly, upon the ground that a liberal profession not only needs no such code or rules as the old one which forbids such consultations, but is cramped, belittled, and even disgraced by their existence in the professional statutes. They seem to believe that error may not only be freely tolerated, but should be accepted in a fraternal and missionary spirit as the best way to overcome it and convert it. Therefore, the real issue between the advocates of the new code and the old one, is not whether they shall consult with homœopathists, eclectics, etc., or not, but whether the medical profession at large has or has not reached that high ground of professional and moral virtue where rules for consultations are unnecessary. To such as believe in the millennial condition presented by one side of this issue, the old code of ethics seems puerile and illiberal, and therefore sufficiently wrong to be abrogated. To them its existence seems very much like the existence of laws against offences in a community where offences had ceased to occur. But to those who see the overcrowded state of the medical profession, and the struggle for life which ensues upon the business-like way in which medical schools are chartered by States, and then turn out their annual masses of graduates in about four times the number needed, and who realize that the material from which the profession is thus recruited is not above the average of human nature in general, the relaxation or abrogation of law seems dangerously unsafe and unwise. All the sects or so-called systems of medicine owe their existence to radical differences in their principles of action, and such sects arise from time to time, on the ground that they are different from and incompatible with any that have existed before; and all past time has seen them so arise and flourish for a longer or shorter period, less in proportion to their amount of truthfulness and soundness than to the business-like way in which they were introduced and pushed.

If then, these so-called systems are fundamentally different and incompatible, and exist because they are so, they are necessarily in antagonism, as they claim to be. Then what good can come of consultations between them? Practiced separately, and the community free to choose between them, is the only rational course. All claim to be based on declared principles and supported by accumulated research and experience, yet if the experience of any one of them be sound and trustworthy, the experiences of all the others must be fallacious and deceptive, because they are deduced from opposite and incompatible bases. Any attempt, therefore, to harmonize and utilize experiences deduced from opposing systems of action must, in the nature of the conditions, be fruitless. Experience is trustworthy or the reverse, first, upon the soundness of the principles upon which it is based, and next upon the knowledge and the accuracy of the observations upon which it has accumulated. Hence, opposing systems and the experience which is based upon their opposition to each other may logically be tried separately, one after the other, but never can be logically or wisely or safely tried together, no more than any two opposing systems can be practiced together.

The practitioner may believe in one or the other, or neither, but cannot believe in both; and he must be equally dishonest when he professes to believe in both or in neither. If, then, it be impossible for an individual to honestly practice opposing and incompatible systems, either upon his own or his patient's choice, then it must be equally impossible for two individuals believing in opposing and incompatible systems to so combine their knowledge and experience as to be of any value, though both may be honest in their convictions in regard to their opposing systems. Hence the public can never be benefited by heterogeneous consultations in medical practice no more than in religion, politics or science, even if it be granted that benefit may accrue from trying one system after another, or one doctor after another, regardless of whether the systems of either be rational or not. What possible good could come from a consultation between a modern astronomer and one who believes the sun moves daily from east to west? And yet both may be honest, and both certainly base their convictions upon observation and experience, and the experience which supports the error is apparently the best, and is that which—other things being equal—the layman would be most likely to accept.

But there are other parties to this question, namely, the homœopathists, hydropathists, eclectics, etc., and the patients of all the sects. There is no evidence whatever that these numerous legally qualified sects desire any such consultations as are proposed, or that there is any failure on their part to recognize the impracticability of such a proposal, or that they are in any way dissatisfied at being left to stand by themselves. If they have knowledge enough to deal with the issues of health and disease, life and death, and are honest and earnest in their convictions, they should be equally prompt to see that neither they nor their patients could gain anything from heterogeneous consultations. If the third party to the proposal, and the one most interested of all, namely, the patient, does not see the difficulty, and, as you say, does not recognize or care for it, but simply wants to try other doctors from rival schools, then it is most important that the public should be better instructed in the conditions of the problem thus undertaken to be solved. That the choice of a physician and the trust in his knowledge and skill are rarely decided upon any principle, but generally upon sentimental and very superficial grounds, must be acknowledged. But that is not the fault of the physician, nor of his system, no matter what that may be, and it is not mended but only complicated by going from one system to another without knowing or caring about the soundness or unsoundness of any. Physicians are too often selected on the same grounds as are patent medicines. The best market is to the one best advertised, and if immediate benefit be not obtained another one is tried.

Until some principle of action be recognized, and a better intelligence be used, the sick and the suffering, and their hardly less suffering friends, will continue to drift anchorless in the sea of error and false experience which surrounds them in their time of trial, and all schemes of heterogeneous consultations will prove as unsatisfactory as they are irrational. E. R. Squibb.

Brooklyn, N. Y., June 23, 1882.

[If the premises from which the two schools started were opposite and irreconcilable, consultations between homœopaths and regulars could obviously do no good. But it is only as to the use of drugs that this is true, and the use of these is only a small part of medicine. In their general view of the nature and causes of disease and the inferences to be drawn from observed symptoms, regulars do not differ from homœopaths or even hydropaths or "eclectics;" while very frequently, even in the cure of disease, drugs play a very small part. In everything relating to disease except the action of drugs, the physicians of the two schools are as one, and their deductions from experience are the same. Consequently there is no similarity between a consultation of this sort and a consultation between a modern astronomer and the Reverend Doctor Jasper. A regular may get help from a homœopath in making a diagnosis of a difficult case or in prescribing a course of life and diet to a patient; just as he sometimes gets assistance from a hydropath by sending a patient to a "water-cure," though he no more believes in the theory of water cure than he does in the dogma of *similia similibus* or the nostrums of quacks.—Ed. Evening Post.]

In this editorial paragraph which follows the writer's communication the position is taken that the homœopathists only differ from the teachings of rational medicine in the use of drugs, and that this "is only a small part of medicine." Here are certainly two grave errors. First, they have been shown to be in direct opposition in regard to both the nature and the expression of disease, and that it is upon this radical difference that their different and opposite usage of drugs is practiced. Second, that the use of drugs is only a small part of medicine is, perhaps, a still more grave error. All the medical sciences, as anatomy, physiology, chemistry, etc., are learned merely as the ground-work for knowledge of the etiology and pathology of disease, and these in their turn are only useful to mankind for the treatment of disease. Hence the art of medicine is practically—to the patient—not "only a small part," but all there is of it, and therapeutics, or the application of remedies to the cure of disease, is, practically, medicine itself. Now, drugs are not only remedies, but they constitute by far the largest and most important class of remedies, and without them there would be no art of medicine. Or, being an art of medicine, as there certainly is, and the agents or implements of this art being mainly drugs, the application of these upon two different and opposite principles must be, so far as it is carried on, directly destructive of that art.

In regard to the help which the different so-called systems could get from association with each other in consultation outside of questions of therapeutics, their training and experience are not and cannot be the same, because their means to their ends are not the same, and any help must come from some surrender of principle on one side or the other. They may equally desire help in the diagnosis of disease, but as diagnosis has a different explanation and value in its indications to each, it cannot help either until the other surrenders, and, therefore, must be much more helpful when two or more of the same system are consulting. If the various systems were less numerous than they are, so that help within the ranks and lines of thought and practice were inaccessible to the individual, then there would be stronger grounds for any of them to look for help from irreconcilable sources.

If, then, these positions be well taken against those of the "Post," there is a very strong similarity between consultations of this sort and a consultation in regard to the evidence and the experience as to whether the sun does or does not move, and the conclusion must be that it "could obviously do no good," except in the mere perfunctory way in which a consultation is too often a mere sham, wherein one calls in another to justify and support his position in a desperate case, so that patient and friends may feel better assured that nothing more could be done.

In this connection it may not be amiss to recall the present standing of homœopathy as a system of practical medicine and the system which the "Post" thus defends as "an important and growing branch of the medical profession," having its "chartered institutions" and "plenty of them," with "8,000 homœopathic physicians in the United States, and a dozen homœopathic colleges, turning out a couple of hundred new physicians every year."

Homœopathy is based chiefly and compactly upon three propositions of Hahnemann, and these are its distinctive principles, which, if true, constitute its claim to be a system of practical medicine in contradistinction and opposition to any system before known; for, if true, they completely overturn and reverse the teachings and observations of all previous ages.

These propositions, although presented by Hahnemann as new and originating with him, may all be traced back to a far earlier date* where they are in part foreshadowed in the speculations and crude reasonings of early medical writers, but they never were formulated into a system of medicine until Hahnemann did it, and until they had practically died out with the errors of their time.

The best support obtained by Hahnemann in reviving these shadowings was in the use of so-called alteratives and counter-irritants, and from that day to this the effects of such remedies have been claimed as proofs of the truth of homœopathy. Now, there is nothing more sound in medical philosophy nor better established in medical practice than the utility of counter-irritation; and the blister, moxa and seton have always been most effective agents since the time of Hippocrates. By these an internal or inaccessible irritation or inflammation or other abnormal condition is successfully treated by an external irritation of greater activity, greater extent or a longer time of application. This, say the advocates of Hahnemann, is like curing like—at least sometimes—and, therefore, proves the dogma to be rational and tenable as a system of medical practice.

* See especially a lecture entitled "Medical Highways and By-Ways," by Oliver Wendell Holmes, M. D., LL.D., delivered before the students of the Medical Department of Harvard University, May 10, 1882, published in the "Boston Medical and Surgical Journal," Vol. cvi., No. 22, page 505 *et seq.*

The assumption, though somewhat plausible, is not true, and its plausibility lies in the superficial character of the reasoning upon the facts. The blister, or counter-irritation, does not cure the internal irritation but merely translates it to the blistered surface and holds it there whilst the original tissues are regaining their normal conditions. Then it gets well along with the artificial irritation. That it is not cured by the blister or issue, and is not in accordance with either of the dogmas of homœopathy is proved by the fact that if the counter-irritation artificially produced be less in quality or quantity or be applied for too short a time—especially if it be less in quantity as true homœopathy would require—it not only fails to translate the internal irritation to it, but is itself translated to the locality of the greater irritation, and makes the disease worse instead of better, on the well-known principle that wherever the greatest irritation is there will be the greatest affluxion or flowing to of all lesser irritations. This plainly shows through what mistakes or errors the ancient history of rational medicine has been made to support homœopathy, when in reality it has only furnished a starting point for the irrational delusions of Hahnemann, as is well shown by Dr. Holmes in his lecture referred to.

In the logical order of the three propositions of homœopathy, the first asserts a new doctrine of the origin and nature of disease. Seven-eighths of all chronic diseases are stated to be the effects—or the modified effects—of Psora, and a detailed list of these maladies are given. The discovery, many years ago, of the acarus scabiei, or itch insect, as the sole cause of Psora, and the destruction of the insect as the prompt, effective and only mode of cure, disposed of this delusion, and, as far as the origin and nature of disease went, destroyed the foundation on which the system was erected, but still homœopathy went on.

The second proposition, based upon the first one, and, therefore, baseless as soon as that was destroyed, was set forth in the Latin "aphorism," *similia similibus curantur*—"like is cured by like." That is, a medicine which in a well person will produce a condition similar to the itch, will cure the itch in a person who has it. This dogma, if true, destroys all previous knowledge and experience in the treatment of disease by reversing the principles upon which it was based, and by direct inference denies that any previous treatment could have been otherwise than hurtful. To use agencies which counteract disease by opposing its processes and progress was all wrong, and a directly opposite course was sought to be substituted. The analogical evidence of all the physical sciences and the direct evidence of pathology and chemistry at once disproved the principle of this dogma by the same kind of testimony which showed that water would not run up hill, nor moisture arrest the processes of decay. Thus its principle of operation was early defeated, while its practical application was defeated at a later day by showing that Psora could only be cured by destroying the insect that was the sole cause of it. All the natural laws are known to govern matter by counteraction and opposition, and not by similarity of action; yet here is a dogma which has withstood all this, without destroying the order of nature, and which, according to the "Post," is increasing in power and influence for good to mankind, and, therefore, deserving of professional recognition because it has public recognition. That is, anything that receives a small share of public and newspaper recognition and endorsement should be accepted and acknowledged as being possibly useful to the public, no matter how absurd the doctrines may be shown to be when tried by all the natural laws governing matter, as well as by accurate observation and practical experience.

The third proposition of Hahnemann is, in effect, that the potency of medicines for the cure of disease is increased by dilution—that quantities infinitesimally small have correspondingly greater power than larger doses. In regard to this smallness of dose, it is probably Jahr, in his hand-book of homœopathy, who says that one drop of any elementary medicine, well mixed with the waters of Lake Maggiore, would not approach the dilution of the higher potencies, and this is strictly true, for it has been mathematically proved that one grain of any medicine carried to the thirtieth potency of homœopathic dilution, and made up into doses, would require a vessel of the size of the solar system to hold them.

But the mathematicians were the first to show the fallacy of this dogma by proving that a part cannot be greater in power than the whole. Then the physicists showed that, while light and heat and all other potencies were rapidly diminished by dilution, it was impossible that this asserted exception could be true in any sense. But all such arguments were met by that tremendous weapon of the ignorant and the fanatical, namely, individual experience, which must be the ultimate truth. The volumes of "provings" published from time to time, with detailed accounts of the symptoms produced by these infinitesimal doses upon individuals, were held to set at naught all knowledge not only of disease and its management by rational medicine, but all knowledge of the physical laws of the universe, and so the dogma continued to gain ground not only with the ignorant, but also with many educated people, who proved not less credulous, nor able to avail themselves of education. But by-and-by came the spectroscope, and its revelations are no less fatal to this proposition than was the discovery of the itch insect to the first proposition, for it has shown conclusively that all matter is very universally disseminated in infinitesimal quantities. This means that all living beings are taking homœopathic doses of immense power of everything, every moment of their lives without the symptoms detailed in the volumes of provings. No attempt has ever been made by any homœopathic writer to meet the spectroscope on this impregnable ground, and probably no attempt ever will be made, and yet the dogma stands as an integral part of homœopathy. It is true that many who call themselves homœopathists have rejected both the first and the third of these propositions, and adhere only to the second, but such are not true homœopathists, and are unworthy of the name, though the adherence to one of three irrational dogmas, which constituted a so-called system, after it has been disproved with the others, does not give them any better claim to recognition on the part of any rational system of medicine.

If an honest believer in only the second proposition of homœopathy uses opium to relieve pain, or chloral to procure sleep, or quinia to arrest fever, and all in large effective doses, he must do so upon a line of reasoning with himself that is not homœopathic but is the reverse of it. If he does not so use them and many other similar agents, he must deliberately deny to his patients the advantages which a medical profession has to offer to suffering humanity; and then, whether he does or does not so use them, his name as a homœopathist becomes a mere trade-mark and advertisement by which he makes a living through some unknown means,—occult and secret because not in accordance with natural laws nor explainable through their operation.

It will, therefore, be seen that homœopathy as a system of medicine has, at this time, no more standing as a rational or successful system of procedure than has clairvoyance, eclecticism, hydropathy, and all that genus. Legal recognition gives none of them a rational standing, because in conferring it the legislators do not enter into the question of their soundness nor of their rationality, but only upon the question of their popularity, or the proportion of the lay public which supports them, or demands them. If this popularity be, as it is, the basis of legal recognition, then all the trade-mark patent medicines which are advertised into popularity and flood the country are better entitled to legal recognition, because they are more popular, for, whilst there are perhaps not more than 25,000 men and women who practice medicine on all the exclusive and irrational dogmas together, and whilst their patients are confined, perhaps, to 4,000,000 or 5,000,000 of the population of the country, quack medicines in one form or other are said to reach the sick or ailing portion of over 30,000,000 of the population.

This enormous proportion of the population seem to choose their physicians very much as they choose their quack nostrums, namely, upon that most dangerous form of ignorance, a self-assumed knowledge of themselves and their disorders; and this liberty of choice can be in no way abridged so long as it is supported by the newspapers in such articles as that above quoted from the "Post," instead of being corrected. The masses of the population read little else than the newspapers and the one thing upon which all newspapers are in accord is in the publication of the advertisements of quack nostrums and of editorial articles, whose tone, temper and teachings are fairly represented in the above-quoted article which, though not so intended, really supports this freedom of choice from the pernicious nostrums of its own columns, and which makes this country, through pure mercantile enterprise for getting money without earning it, the most medicine ridden, or rather nostrum ridden country on the face of the earth.

While such failure to recognize any fundamental principles in the art of rational medicine, and of teaching the public so, must needs be accorded to the newspapers, because it cannot be prevented, such teaching need not be accepted by the profession of rational medicine when the newspapers attempt to reason it into heterogeneous consultations on the doctrine of there being no fundamental principle of action anywhere, or at least no more in one sect than in another, when such sects are in direct opposition.

It would appear by the following extract from the "Proceedings of Congress" on the 14th of July, that the newspaper discussion of the new code of ethics is already producing its legitimate effects upon the politicians.

In the Senate:—

Mr. Cameron (Rep., Pa.) introduced a joint resolution making it a misdemeanor, punishable by a fine of $500 and dismissal from office, for any officer of the United States Government, civil, military, or naval, to make any discrimination in favor of or against any school of medical practice, or its legal diplomas, or its duly graduated members, in the examination and appointment of candidates for medical service in any department of the Government. Referred.

This extension of the idea of civil and religious liberty to the poor and down-trodden irregulars of all "schools" is certainly going farther than the framers of the new code intended; but it is really only what might have been expected as an outcome of their liberality and tolerance of error, for if there be no principle at stake but only mere intolerance of school, then there should be no discrimination permitted. Free trade and unrestricted liberty means just that, whether it be in matter of life and death, in morals or in trade. Mr. Cameron might with equal wisdom and justice to the true interests involved have abolished the Medical Departments of the Army and Navy and substituted for them five patent medicines whose joint advertisements should cover all the possible diseases, because this is really the most popular "school" of all. Suppose Mr. Cameron's resolution sends on board a national vessel a medical man of the "school" of homœopathy for example, to practice his "school" among officers trained at Annapolis in accordance with established physical laws. They would not want to trust their lives to the practice of an irrational "school." Then what becomes of *their* civil liberties? They must simply submit and be doctored by joint resolution of Congress, or leave the government service to such as are not troubled by any principles, and who might in common with a considerable portion of the unthinking community prefer to be doctored by that "school" whose medicines were pleasantest to the taste or most easily taken. But in the Army and Navy unless there be an assortment of "schools" supplied to each camp or ship some people will run the risk of not having their choice of "schools," and of not being able to turn from one school to another. That "school" which owes so much of its popularity and success to the very superficial and irrational claim that it gives no nauseous medicines, might not satisfy soldiers and sailors as well as it does some of the more imaginative people in civil life, and then the soldiers and sailors would be down-trodden and abridged of their liberties.

In the Senate of the United States there can certainly be no danger that Mr. Cameron's chaotic resolution will ever be seriously considered, but that it was offered at all shows that even in some high places there is nothing like principle or law recognized as underlying or supporting the medical profession which should keep it from affiliation and admixture with mercantile empiricism.

See Pages 146 & 175

ASSAYS OF CINCHONA.

Since the process at page 76 was published, it has been found that some of the quantities and many of the details were adjusted to barks which were rather exceptionally soft and spongy, and therefore easy to exhaust, and the very next bark tried after the process was published happened to be hard and compact, and therefore so difficult to exhaust as to require somewhat more menstruum and longer digestions. It is therefore thought better to publish a corrected process, with the improvements which have been suggested by a few months' further experience with a greater variety of barks.

In these assays it must never be forgotten that the point of greatest importance as well as of greatest difficulty is the complete exhaustion of the bark, and knowing when the exhaustion is complete. Next, it must be always borne in mind that different samples of bark differ very much indeed in structure and therefore, in accessibility to the exhausting menstruum. Some are soft and spongy and easily exhausted with a small quantity of liquid in a short time. Others, which do not sensibly differ in appearance of either the bark or its powder, are hard and compact, requiring more liquid and longer digestions. Hence, while the process given at page 76 is very nicely applicable to some barks, and is entirely sufficient for those upon which its details were adjusted, it does not do equally well for other barks, but may be so modified as to apply equally well to all.

This great difference in the facility with which different cinchona barks are exhausted has been too much overlooked, and it may be the principal cause of the disagreement between Drs. Biel and De Vrij, who, working by the same process, find a different length of time necessary for the digestion,—the former advising a digestion of four hours, while the latter finds one hour sufficient.

The principles upon which the process at page 76 is based are all confirmed by further experience. These are that amylic alcohol freely dissolves all the alkaloids of cinchona barks, but does not dissolve the salts of those alkaloids, and that it dissolves much less of the coloring matter than other solvents; and the outline of the method is to break up the natural salts of the alkaloids in the bark, and fix the coloring matters by lime in excess. Then to extract the free alkaloids with amylic alcohol, ether being added to facilitate the percolation and filtration. Then to convert the alkaloids into salts, and thus get them out of the amylic alcohol into a watery solution. Then to precipitate them from the watery solution in the presence of chloroform, which dissolves them freely, and finally to evaporate off the chloroform and weigh the residue as anhydrous alkaloids.

Take of the powdered Cinchona 5 grammes=77.16 grains.
Lime, well burnt, 1.25 " =19.29 "
Amylic Alcohol,
Stronger Ether,
Purified Chloroform,
Normal Solution of Oxalic Acid,
Normal Solution of Sodium and
Water, of each a sufficient quantity,

or, double all the quantities throughout, as well as size of vessels, etc., if the barks be poor, or if it be desired to divide the errors of manipulation.

Add to the lime contained in a 10 c.m.=4 inch capsule, 30 c.c.=1 fluidounce of hot water, and when the lime is slaked, stir the mixture, add the powdered cinchona, stir very thoroughly and digest in a warm place for a few hours, or over night. Then dry the mixture at a low temperature on a water bath, rub it to powder in the capsule and transfer it to a flask of 100 c.c.=3.3 fluidounces capacity, and add to it 25 c.c.=$\frac{5}{6}$ fluidounce of amylic alcohol. Cork the flask and digest in a water bath at a boiling temperature and with frequent vigorous shaking for four hours. Then cool and add 60 c.c.=2 fluidounces of stronger ether, s. g. 0.728, and again shake vigorously and frequently during an hour or more. Filter off the liquid through a double filter of 10 c.m.=4 inches diameter into a flask of 150 c.c.=5 fluidounces capacity, and transfer the residue to the filter. Rinse out the flask onto the filter with a mixture of 10 volumes of amylic alcohol and 40 of stronger ether, and then percolate the residue on the filter with 15 c.c.=half a fluidounce of the same mixture added drop by drop from a pipette to the edges of the filter and surface of the residue. Return the residue to the flask from whence it came, add 30 c.c.=1 fluidounce of the amylic alcohol and ether mixture, shake vigorously for five minutes or more and return the whole to the filter. Again percolate the residue with 15 c.c. of the menstruum applied drop by drop from a pipette as before. Then put the filter and residue aside that it may be afterward tested in regard to the degree of exhaustion.

Boil off the ether from the filtrate in the flask by means of a water bath, taking great care to avoid igniting the ether vapor, and also to avoid explosive boiling by having a long wire in the flask. When boiled down as far as practicable in the flask transfer the remainder to a tared capsule of 10 c. m.=4 inches diameter, and continue the evaporation on a water-bath until the contents are reduced to about 6 grammes=92 grains. Transfer this to a flask of 100 c. c.=3.3 fluidounces capacity, rinsing the capsule into the flask with not more than 4 c. c.=64 minims of amylic alcohol. Then add 6 c. c.=96 minims of water and 4 c. c.=64 minims of normal solution of oxalic acid, and shake vigorously and frequently during half an hour. Pour the mixture while intimately mixed onto a well wetted double filter of 12 c. m.=4¾ inches diameter, and filter off the watery solution from the amylic alcohol into a tared capsule of 10 c. m.=4 inches diameter. Wash the filter and contents with 5 c. c.=80 minims of water applied drop by drop from a pipette to the edges of the filter and surface of the amylic alcohol. Then pour the amylic alcohol back into the flask over the edge of the filter and funnel, rinsing the last portion in with a few drops of water. Add 10 c. c.=160 minims of water and 1 c. c.=16 minims of normal solution of oxalic acid; again shake vigorously for a minute or two, and return the whole to the wetted filter and filter off the watery portion into the capsule with the first portion. Return the amylic alcohol again to the flask, and repeat the washing with the same quantities of water and normal oxalic acid solution. When this has drained through, wash the filter and contents with 5 c. c.=80 minims of water applied drop by drop from a pipette. Evaporate the total filtrate in the capsule on a water-bath at a low temperature until it is reduced to about 15 grammes=241 grains, and transfer this to a flask of 100 c. c.=3.3 fluidounces capacity, rinsing the capsule into the flask with 5 c. c.=80 minims of water. Add 20 c. c.=·66 fluidounce of purified chloroform, and then 6.1 c. c.=98 minims of normal solution of sodium, and shake vigorously for five minutes or more. While still intimately mixed by the shaking, pour the mixture upon a filter of 12 c. m.$=4\frac{3}{4}$ inches diameter well wetted with water. When the watery solution has passed through, leaving the chloroform on the filter, wash the filter and chloroform with 5 c. c. $=80$ minims of water applied drop by drop. Then transfer the chloroform solution by making a pin-hole in the point of the filter, to another filter of 10 c. m.$=4$ inches diameter, well wetted with chloroform, and placed over a tared flask of 100 c. c.$=3.3$ fluidounces capacity. Wash the watery filter through into the chloroform-wet filter with 5 c. c.$=80$ minims of purified chloroform, and when this has passed through into the flask, wash the chloroform-wet filter also with 5 c. c.$=80$ minims of chloroform, applied drop by drop to the edges of the filter. When the whole chloroform solution of alkaloids is collected in the flask, boil off the chloroform to dryness in a water bath, when the alkaloids will be left in warty groups of radiating crystals adhering over the bottom and sides of the flask. Place the flask on its side in a drying stove, and dry at 100° C.$=$ 212° F. to a constant weight. The weight of the contents multiplied by 20 gives the percentage of the total alkaloids of the cinchona in an anhydrous condition, to within ·1 or ·2 of a per cent. if the process has been well managed.

The object of stirring the powdered bark into the slaked lime and water while hot is to swell and permeate the particles as rapidly as possible, introducing the lime solution into the innermost parts of the particles, and this process goes on during the digestion and drying of the mixture. Beside setting the alkaloids free from their natural combinations in the bark, the excess of lime so combines with and fixes the coloring matters, that even with the red cinchonas the subsequent steps of the process are not confused or obstructed by coloring matter.

Various other precipitants were tried with this and other menstrua, but none answered so well as lime. The menstruum of ether and alcohol with ammonia, recommended by Biel and adopted by Prollius and De Vrij, were tried, but did not do so well, as lime had to be subsequently used, while the creeping during evaporation was more difficult to avoid.

The digestion and shaking with amylic alcohol doubtless dissolves all the alkaloids present, and dissolves very little beside, but a portion of the solution remains absorbed by the spongy structure of the particles. Such portions can be percolated out on a filter with amylic alcohol and without ether, but the filtration is very tedious and troublesome, requiring more than a day. But by diluting the amylic alcohol with about three times its volume of stronger ether it is rendered very manageable, and the filtration and washings are accomplished in about an hour, leaving the residue practically exhausted. If this solution be evaporated either spontaneously or by a water bath it creeps over the edges of the capsule badly, and no good result can be reached. But if it be boiled down in a flask in a water bath as directed, there is no difficulty, for after the ether is driven off the remainder has no tendency to creep over.

In this part of the process great care must be taken that the ether vapor does not take fire. When evaporated to 6 grammes as ascertained by trying on a scale from time to time, the ether is all gone and a solution of the alkaloids in amylic alcohol remains. One prominent object of the next step of the process, namely, the washing out of the alkaloids from the amylic alcohol as oxalates, is to free them from waxy and fatty matters always extracted from the bark by all solvents which effect a complete exhaustion. In washing out the alkaloids these waxy and fatty matters are left in solution in the amylic alcohol, and with it are thrown away.

If this amylic alcohol be evaporated on a water-bath to a constant weight, the residue will amount to about a half of one per cent. of the cinchona taken, and therefore if only a very rough estimate of the total alkaloids be needed, this may be obtained by continuing the evaporation of the amylic alcohol solution to a constant weight and subtracting a half of one per cent. from the result.

As the alkaloids are all soluble in amylic alcohol, while their salts are not, a definite quantity of solution of oxalic acid being added, the alkaloids are washed out of the amylic alcohol as acid oxalates. But they are rather difficult to wash out completely, and hence three washings are directed. If close results are not needed, two washings are sufficient. In pouring the amylic alcohol back from the filter into the flask, over the edge of the filter and funnel, a little dexterity is required, and the rim of the funnel must always be somewhat above the filter, in order to be quite successful. The double filter well wetted with water, and kept well wetted, retains the amylic alcohol very well, while the watery solution drains off to the last drop. But should there be any minute holes in the paper, or should the paper not be kept well wetted, a very little of the amylic alcohol may get through; but if so, it does not matter, for it will go off with the vapor in the subsequent evaporation, or adhere to the capsule in an insoluble condition. The solution of the oxalates is too dilute for precipitation, and as it is not acid enough to injure the alkaloids by heat, it is evaporated to 15 grammes. As this solution has no tendency to creep, the evaporation is best done on a water-bath. In the next step the alkaloids are precipitated in the presence of chloroform, and it makes a very notable difference in the result if commercial or impure chloroform be used, hence purified chloroform is directed. Having used in all 6 c.c. of normal solution of oxalic acid in converting the alkaloids into acid oxalates, it is only necessary now to add 6.1 c.c. of normal solution of sodium in order to be sure that the precipitation is complete to an alkaline reaction, yet without a sufficient excess of sodium to hold the alkaloids from the chloroform; and hence the use of these normal solutions is important as well as very convenient. After a thorough shaking, the now free alkaloids are all dissolved in the chloroform, and it is only necessary to separate this completely in order to get them all. Here again a wet filter becomes a most complete and convenient mode of separation. The watery solution of oxalate of sodium goes through to the last drop, but not a particle of chloroform passes if the paper be good, and here a double filter is not needed; neither is it necessary to wash the filter very much. In the chloroform separation of the alkaloids a film of impurities, soluble in neither liquid, is apt to be present between the two liquids. This is often hardly a weighable quantity, and when small may be neglected and the chloroform solution be at once transferred to the tared flask for evaporation. But in close estimates it is easily separated in the way prescribed, by filtration of the chloroform solution through a chloroform-wetted filter into the flask. This chloroform-wetted filter not only excludes these impurities, but also any water that may drain out of the water-wetted filter. A pin-hole made in the point of the water-wetted filter is a very good way of transferring from one filter to the other.

The boiling down of the chloroform solution and drying the alkaloids to a constant weight and weighing them in a flask rather than in a capsule, is directed in order to have them in a condition convenient for estimating the ether-soluble alkaloids and quinia.

The above process gives a fairly good and trustworthy account of the total alkaloids in all the cinchona barks to which it has yet been applied, and is more conveniently and easily managed than any hitherto met with which is adapted to the moderate degree of skill possessed by this writer and by well-trained pharmacists generally.

There may be, and doubtless are, other processes better adapted to the expert skill of the highly trained chemist.

Estimation of Quinia.

After much labor, extended over many years, and the trial of all the principal processes which have been published, the writer is obliged to acknowledge that he has found no process for the accurate separation of the cinchona alkaloids which was within the scope of his ability to apply with success. The more complicated and delicate processes of the higher chemists seem only successful in their hands, or at least none of them have thus far come into any general use, and under these circumstances it seems only practicable, in a general way, to reach near approximations by some method which is simple and easy of application.

This much only is claimed for the following process.

It is common to have the cinchona alkaloids divided into ether-soluble alkaloids, and those not soluble in ether. But this is a very inaccurate subdivision, for all are quite soluble in ether whether the ether be absolute or 94 per cent., and the application of ether to any mixture will easily dissolve the whole. Thus either the powdered bark itself, or after having been mixed with milk of lime and dried, can easily be exhausted of alkaloids by ether alone. All that can be said is that quinia, quinidia and cinchonidia are more soluble in ether than the other alkaloids, and that quinia is most soluble of all, and is very soluble,—so soluble that it dissolves in large quantity in ether that has been already saturated with other less soluble alkaloids. And further, that in the presence of any ordinary proportion of any or all the other cinchona alkaloids all the quinia of a mixture will be dissolved by ether if enough of this solvent be present to fully dissolve the quinia if that alkaloid was alone. It is, however, still useful to distinguish the more valuable cinchona alkaloids, namely, quinia, quinidia and cinchonidia, as the ether-soluble alkaloids, because they can be roughly but still usefully separated by ether in such a way as to better define the values of various barks as they come into the markets for use, and the following process has been contrived to give a fairly good account of the so-called ether-soluble alkaloids as a group, if all are present, and a somewhat less definite account of the quinia as well.

Into the flask containing the total alkaloids, after these have been weighed, put first 5 grammes=78 grains of glass, which has been ground up in a mortar to a mixture of coarse and fine powder, and then 5 c. c. = 80 minims of stronger ether. Cork the flask and shake it vigorously until by means of the glass all the alkaloids have been detached from the flask and ground up in the presence of the ether into fine particles. In this way the definite quantity of ether, which is large enough to dissolve all the quinia that could possibly be present, becomes entirely saturated with alkaloids in the proportion of their solubility, and the solution will necessarily embrace all the very soluble ones as the quinia.

Next, mark two test tubes at the capacity of 10 c. c. = 160 minims each, and place a funnel and filter of 7 c. m. = 2.8 inches diameter over one of them. Wet the filter well with ether, and then pour on to it the mixture of alkaloids, ether and glass, from the flask. Rinse the flask out two or three times onto the filter with fresh ether, and then wash the filter, and percolate the glass with fresh ether, applied drop by drop from a pipette, until the liquid in the test tube reaches the 10 c. c. = 160 minim mark. Then change the funnel to the other test tube, and continue the washing and percolation with ether until the mark on the second test tube is reached by the filtrate. Pour the contents of the two test tubes into two small tared capsules, evaporate to a constant weight and weigh them. The first capsule will contain what may be called the ether-soluble alkaloids. Subtract from the weight of these the weight of the residue in the second capsule, and the remainder will be the approximate weight of the quinia extracted from the 5 grammes of bark. These weights multiplied by 20 will give the percentage of ether-soluble alkaloids and of quinia.

The explanation upon which these conclusions are based is as follows:

The quantity of ether used is abundant to dissolve all the quinia and most of the quinidia and cinchonidia, and presumably does so, and dissolves beside all that it is capable of holding of the less soluble alkaloids. This saturated solution is filtered off, displaced and washed out. Then an equal volume of the solvent ether is applied to the residue containing the less soluble alkaloids, and is presumably nearly saturated by these, but contains no quinia and but little quinidia perhaps, though it contains as much of all the other alkaloids as did the first portion. If the two equal volumes of solvent, then, contain nearly equal quantities of the less soluble alkaloids, while the first contains nearly all of the more soluble ones, then it only needs that the weight of the second residue be subtracted from the weight of the first to leave only the weight of the more soluble alkaloids, such as quinia and quinidia, if the latter should be present.

In two good critical assays, one of red and the other of yellow cinchona, made for the purposes of this paper at this time, the red cinchona (succirubra of Ceylon) gave ·335 grammes of total alkaloids, which is ($\cdot335\times20=$) 6.7 per cent. These total alkaloids then gave ·210 grammes of ether-soluble alkaloids, which is equal to ($\cdot210\times20=$) 4.2 per cent., and this corrected by subtracting ·015 grammes of less soluble alkaloids or ($\cdot015\times20=$) ·3 per cent., gives ($4.2-\cdot3=$) 3.9 per cent. of quinia. Then, as the ordinary sulphate of quinia contains about 73.5 per cent. of quinia, this 3.9 per cent. of quinia would be equal to (as 73.5 : 100 : : 3.9:) 5.3 per cent. of sulphate.

The yellow bark assayed at the same time (Cinchona officinalis from the Ootacamund) gave of total alkaloids 7.3 per cent. Ether-soluble alkaloids 3.48 per cent. Quinia 2.76 per cent. Equal to sulphate of quinia 3.75 per cent.

In connection with these two assays it is worthy of remark that here, as is very rarely the case in the experience of this writer, the red cinchona yields the smaller percentage of total alkaloids with the larger percentage of quinia. Usually the proportions are just the reverse of this between the red and yellow barks.

POPULAR MEDICATION.

The epidemic of "St. Jacob's Oil," from which this whole country has been suffering for some time past, and which more recently attacked this locality, deserves a little variation in the mode by which the oil is advertised.

In this vicinity the epidemic has been very severe in character, but in its onset it has not varied from the usual type in its spread. Commencing in the newspapers, it rapidly spread to the fences and dead walls of all the streets, and thence infected the passers-by. So virulent was the attack, that common rumor has it that through an expenditure of some $400,000, in advertising, the whole country is now suffering at the rate of about $40,000 a week of total sales. If this be true or anywhere near the truth, the latter sum forms a very respectable item in the interest account of the national debt to the patent medicine business,—a branch of mercantile enterprise exceeded by none.

It is estimated on a basis that can hardly be called statistical, though it may be reasonable and probable, that the people of this country consume between five and six times more medicine per capita than any other nation of the world, and yet the people are taxed for it in such a way that they hardly seem to feel it. Or rather the quack medicine tax is so much better managed than the spirit and tobacco taxes, that it does not cost anything like as much to collect it. A very interesting question in political economy is how much better off would the nation be if these taxes were saved by the cure of these mild but not harmless forms of insanity, which cause the irrational use or abuse of patent medicines spirit and tobacco?

Suppose there were only fifty patent medicines, with an aggregate sale of $20,000 a week each. That would be a million dollars a week, or fifty-two millions of dollars a year, and this sum if capitalized at 4 per cent. per annum would represent thirteen hundred millions of dollars.

"St. Jacob's Oil" appears to be a feeble and badly made aconite liniment, and it consists mainly of water, ether, alcohol, turpentines, and a small proportion of aconite with red coloring matter. Its whole function is to make money for the enterprising merchants who own it, and in this it is by no means a delusion or a snare.

Its enormous sale is not only of great service in helping the poor to stay poor, but it also relieves a great many people of their money, who are not poor in anything but common sense, and who take their medicines as they do most of their other deceptions, namely, by being advertised into them, since without advertising not one hundred dollars' worth of St. Jacob's Oil could ever have been sold.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. SEPTEMBER, 1882. No. 5.

PSORIASIS INVETERATA.

This writer has for many years known that his valued friend, Dr. W. C. Reiter, of No. 328 Penn avenue, Pittsburgh, Pa., had suffered from inherited psoriasis, and had accidentally met with a very simple plan of treatment which had relieved him in more than one recurrence of the disease. He has also known that Dr. Reiter as an excellent general practitioner, with a large practice, has been successful in relieving a number of cases similar to his own by the same plan of treatment, and that this treatment was so simple and easy as to be within easy reach of every physician in the United States, without recourse to the druggist or pharmacist, or to anything except the common burdock weed which grows at his door. It was also known that Dr. Reiter would only be too glad to tell all he knew for the benefit of his brother physicians and their suffering patients. But his treatment was so simple, not needing even a fluid extract, that there was danger that if published in these days it would pass as an unscientific vagary, or a small thing. It may therefore be useful to assume, on behalf of Dr. Reiter, the character of the servants of Naaman, and say to the readers of this pamphlet,—"If the prophet had bid thee do some great thing wouldst thou not have done it?"

The following account was sent by Dr. Reiter some time ago, but not with any view to its publication. Lately, however, his permission has been asked for and obtained for its publication, and the readers are congratulated on the agreeable contrast between his style and anything they are used to find here. Hence his pleasant letter is given just as it was received from him, with the omission only of proper names.

DR. REITER'S LETTER.

LAPPA MAJOR.

Radix bardanæ, P.G.—Bardane, Fr.—Burdock, E.—Klettenwurzel, G.—Nat. Ord. Compositæ. Cynareæ.

Heads discoid, homogamous; involucre globous, the scales imbrecated and hooked at the extremity; receptacle bristly; pappus bristly, scabrous, caducous, (2) Coarse. European herbs. Leaves alternate, large. Lappa Major, Gaert.

Leaves cordate, unarmed, petioled. Common in waste and uncultivated grounds and fields in the New England, Middle and Western States. Each plant is a large, conical ill-scented and coarse-looking mass of vegetation, surmounted by a branching irregular panicle of ovoid heads, with tubular corollas of an exceedingly delicate pink color. The leaves are very large, with wavy edges. It has a wonderful design for the dispersion of its seeds. The scales of the involucre all end in a minute, firm hook, which seizes hold of everything that passes by.

The root has long been used as a medicine, particularly in Germany; and alterative, diuretic and diaphoretic properties were ascribed to it. It was prescribed for invalids suffering with rheumatism, skin and other chronic diseases, in powder, infusion, decoction, syrups, etc.,—but never attained a greater popularity than mint, chamomile, balm and other remedies which the good housewife stores in her medical armamentarium.

It was my misfortune to inherit, from my father, Psoriasis Inveterata, which he told me he had inherited from a long line of progenitors. In youth I had spots on my skin foretelling what adult age developed—psoriasis on left leg and ankle—the same place on my body perfectly imitating my father's plague. He was never healed, although he sought medical advice in Europe.

I was a country doctor, and carried a cane on horseback to relieve the agnoizing itching of my leg in warm weather. One warm afternoon (about 1840, I think), I was going to visit a patient with an old farmer, when he exclaimed, "What makes you tear your leg so furiously with the end of that hickory stick?" I replied, "To relieve the maddening itch of my accursed tetter." He said I must cure it; told me he had been afflicted with it on his hands so severely that he had lost his nails. He said I should gather burdock seed and put whisky on it, and take internally. I obeyed; put quite a quantity into gallon bottles and added whisky, of which I had but little; in the others I put alcohol, and stood them in a warm place. After some weeks I began to take a table-spoonful thrice daily, using that steeped in whisky first.

After taking all the whisky tincture I found slight improvement in tetter, but a vast power had been bestowed on my stomach. All my life I had to deny myself many things or suffer; now I could eat sauerkraut, turnips, mince-pie, etc., etc., and only knew I had a stomach from that singular delight we all feel in satisfying a keen appetite with luscious food.

I now began to take alcoholic tincture and found an entirely different preparation. I had to add water, and discovered resin, and at the bottom of each bottle, oil; here was a hint. I put alcohol on the seed which had been macerated in whisky and obtained a resinous tincture. When my old friend and benefactor prepared his tincture, whisky was distilled in copper stills and came off as proof spirits; my whisky was manufactured by steam. My disease improved rapidly and ceased to torture me, although the skin remained dry and furfuraceous.

On the advent of summer I observed in washing my hands (a doctor must do that often) a great increase in sebaceous secretion, which required much soap to remove; now my whole cutaneous surface acquired a condition of the most perfect health. Whilst afflicted with tetter I had learned to eschew hog meat—a meal of sausages or ham was always very aggravating—I became a very sincere and faithful Jew in avoiding swine meat or fat as a diet. For almost forty years I had a healthy skin; but my European tour in 1875 restored my old malady in an aggravated form. Their water, in many of the southern parts full of dolomite, both for drinking and washing, may have contributed; but sandwiches of cold ham and Bologna sausages were the chief enemies. On my return I could not get the tincture, and, when obtained, its effects were not as before. The taste was not a pure, agreeable bitter, but nauseous. Whether this was owing to mould on the seed or to the druggist having ground them, or to the climate I could not tell; Mr. Holland said he had bought the seed in New York.

A pupil of mine, Dr. Clarke, took my place (in Mount Pleasant, Westmoreland county, Pa.) when I came to Pittsburgh. He was so kind as to have quite a lot of seed gathered for me; I prepared the tincture myself and am now perfectly well. I felt that it restored a perfect digestive power which my stomach lacked, and hence have prescribed it in atonic dyspepsia with such success that Mr. Holland can with difficulty supply the demand; the crop last summer was impaired so much by drought that he was compelled to order the seed from several western States, and still believes he will run short before the new seed can be gathered. I send to you some of the oil obtained from the bottom of a tincture bottle; some resin I found on a board last fall under a bushel percolator, from which I thought dripping had ended; I send two kinds of tincture, one obtained from contused, the other from whole seed. It can be made in a few days by heating alcohol and keeping warm; the cold preparation is very tedious; much alcohol is lost, the seed absorbing it. We have lost much resin, which clung to percolator and seed; we now save that by washing seed with warm alcohol, which we use for our fresh seed. The therapeutical action I could best reduce to form by calling it an alterative stomachic; it appears to improve all the nutritive, secretive and assimilative functions. I prescribe from two to four drachms, well watered, a half hour before each meal.

I have for a long time wished to send to you something on this Bardanas seed, but am lazy. A suffering illness has admonished me to do so before I die, and I am doing it before I can leave my room. You are the proper person to introduce a remedy and promulgate one of the most valuable therapeutic agents in my armamentarium medicorum.

By the way, did I send you my little monograph on diphtheria? If not, I will send one right away. I have, this winter, verified my discovery perfectly. *Diphtheria is a functional disease of the liver.* This organ has lost its power of destroying fibrine, of which Brown-Sequard says: "The liver, in a healthy adult, metamorphoses eighty ounces in twenty-four hours." Here you have the remote cause—*inspissated* blood—and the theses of infection, contagion, micrococci, etc., are moonshine, transcendental tomfoolery. The proximate cause—*too much fibrine in blood.* Where a case has not reached a fatal condition, from 24 to 40 hours' medication effects a cure. Hear and ponder this: A few weeks ago Dr. Joseph D———, Jr., lost a fine boy of five or six years with diphtheria. The second son took it, and meeting him one morning on the street, I stopped to inquire about his son. He said "they thought him better." Dr. McC——— was with him, and said to me: I was going for you to visit and treat my son Jim. He was out and aparently well yesterday, and became suddenly and alarmingly ill early last night; his pain in head is alarming; has but little exudation in his throat."

The patient Jim is a very bright boy of eight years, and much attached to me. I said to him, "Jim, how are you?" Placing one hand on vertex and other to forehead, he exclaimed, "Oh, Doctor! I have such pain through my head." His throat had that *intense erythematous redness* which is pathognomonic of diphtheria; a few spots, like milk-stain, were the only exude. His skin was very pale and very hot, and his pulse very tense and quick, frequency not over a hundred.

I pronounced it a very grave case, gave him one scruple of calomel on a tea-spoonful of cold water, and prescribed ten grains to be taken every hour. I ordered five grs. potass. chlorat. in solution every third hour. Gum-water, barley gruel, lemonade and cold water *ad libitum.* My visit had been at 9 A.M.; saw him again at 1 P.M. and 4 P.M. but found no improvement. I lived in the country, seven miles east of city, on Pennsylvania Railroad, and came to city at 8 P.M. to see Jim. His father and Dr. A——— said he had improved. I could not discern it. Begged the mother to continue ten grs. every hour until I came again. She did, *faithfully.* I saw him at 8 A. M., and said: Jim, how are you?" He sprung up on his rump and exclaimed: "Doctor, make mother dress me; I am well and want to go down stairs." After midnight he had begun to sleep peacefully, skin became cool, pulse softened and became full, bowels moved three times copiously, voided urine freely, and said his headache had gone. The interval was increased to three hours, but calomel was continued until dejections were watery, with green gelatinous masses, like fresh-water polyps.

Dear Squibb, smoke that in your meditative pipe—a boy of eight years, with a half ounce of calomel in his *primæ viæ, not prostrated but restored.* Trousseau is the only medical writer I know of who has not only seen, but has most accurately and graphically described all the protean forms of this most fatal malady—and not one of them escapes a clear and most rational explanation by my etiology.

I have read again and again his most graphic articles on diphtheria, and it pains me to observe how he staggers in trying to reduce his notions to a rational philosophy, lacking the light of a sound etiology. Do borrow Trousseau's Clinical Medicine, Vol. ii., and read it. I know it will not only instruct, but delight you. I must here say—my cases have been hundreds—never saw hypercatharsis—have had to give salines—never saw salivation nor other mal effect.

Latterly, now and again, one of our younger medical men, disheartened from failure, will dare to try my treatment and "be born again;" and they become *bold defenders* of the faith; some will half try it in small doses, at long intervals, and say it is a deception; never suspecting the damning lie in their own minds and hearts. I met a fellow once at the bedside of a dying boy of seventeen years, who told me he had *even given my medicine*—and a scruple dose of it. I said, "When?" He replied, "About an hour ago." I told him he should have spared the calomel and made a rational prescription. He asked, "What?" I told him, "A shroud and coffin." I am wearied by the conflict I have had with stupidity, bigotry, mulishness, vain conceit, etc., these many years. Should I take a trip to recuperate, when I get well enough, would you, or could you, find a few medical men of the "Scholar Class," humble, earnest workers, who would lend an attentive ear to my story? I want my profession to wipe this opprobrium medicorum from our glorious old escutcheon.

I forgot to tell you that when my old farmer friend, Mr. T——— told me about losing his finger nails, I was incredulous, and tolerated the license permitted the ignorant and poets in hyperbole—my last attack has vindicated the good old man's veracity. I can show you the nails on both of my thumbs, now almost restored to pristine perfection, but two years ago they were hideous in their malformation and ruin. The disease established itself at the matrix, and the progeny was a fearful monstrosity, all its surface was what Ovid vividly calls or describes as "disjecta membra."

The specimens which accompanied Dr. Reiter's letter were, first, a tincture made from the unbroken seed; next, a tincture made by his pharmacist from the ground seed; next, a portion of oil, and, finally, a portion of resin.

The oil is a bland fixed oil, and from a casual examination it may be said to be like all the fixed oils from similiar seed—without medicinal value. And the same is probably true of the tasteless insoluble resin. The effective part is doubtless that extracted by diluted alcohol. The tincture made from the ground seed is stronger in bitterness than that from the unbroken seed, as might be expected, even when the digestion of unbroken seed has been very long continued. For the doses recommended by Dr. Reiter, namely, a table-spoonful thrice daily, immediately after meals, a tincture should be made about as follows:

Take two pounds of the fresh burdock seed and grind it in a good sharp coffee-mill, putting it through several times with the mill screwed up as closely as possible, until the seed is well broken up, though it need not be in very fine powder, for it is the bruising or contusing effect of the mill teeth that is needed. Put equal parts of the ground seed in two one-gallon bottles, and fill them up with good whisky not less than two years old. These should stand in a warm place, with occasional shaking, for a couple of weeks, when the clear tincture will be ready for use. In an alcoholic preparation like this, which is to exert a prominent effect on the stomach, good whisky, if old enough, is very much better than a diluted alcohol of the same alcoholic strength. If to be taken in doses of one or two tea-spoonfuls or less, as with tinctures in general, the alcohol is as good or better than whisky would be for several reasons. But when the dose exceeds two tea-spoonfuls the menstruum becomes an important therapeutic element, and then good, natural whisky or brandy of sufficient age should alone be used. Of course, it is possible for a manufacturer to make such a preparation as this, but there is not the slightest reason for his doing so. Any good pharmacist or any physician can make it best for himself, and should do so if it is to have a fair trial, for he can then control all the conditions necessary, as for instance, the having the seed of the right plant, having it fresh, having the proper menstruum, and having it perfectly managed. Any one, therefore, who wishes to try Dr. Reiter's treatment should follow his directions and example in preparing the remedy for himself, or at least having it prepared immediately under his own eye; and in an inveterate disease like this, so simple a plan of treatment is certainly well worth trying upon so good an authority as Dr. Reiter.

Dr. Reiter has aimed at getting a saturated tincture, and has used the fresh seed unbroken. But it has often been shown on other similar seed that they should be broken or crushed, and that when crushed a smaller proportion was needed. It is hardly doubtful that the above given proportion of two ounces of crushed seed to the pint will give as strong a tincture as six ounces of unbroken seed to the pint would give.

The maximum dose of Dr. R., as above stated, is four fluidrachms, well diluted, three times a day, immediately after meals, to be continued for months if necessary, if the disease does not yield sooner ; and improvement and restoration may be expected earlier in warm weather than in cold, according to the experience of Dr. R. Relapses are not frequent, and are confined to persons who are gross feeders.

In cases of atonic dyspepsia, without cutaneous eruption, he also finds it useful, but here never prescribes more than a dessert-spoonful, and that before meals, well diluted.

MODERN THERAPEUTICS.

At the end of a recently published surgical paper occurs this sentence.

"I submit these cases for what they are worth, feeling that any plan of treatment which claims to help us out of the desperate straits in which septic accidents place us, is deserving of a hearing."

The paper gives the details of five cases, one of which terminated fatally ; and in two others, at least, the author of the paper says: "The relation in these latter cases, between the use of the acid and the fall of temperature, is not as evident as it might be." Three other cases are mentioned in these words : "With the exception of one case of puerperal septicæmia, one of erythematous erysipelas, and one of lymphangitis, all were successful in result." Of these eight cases, four were unsuccessful, and at least two were doubtful, although the author's way of expressing this is, that with these exceptions—six out of eight—"all were successful in result."

The treatment used was a somewhat recently imported novelty, or rather a new and very superficial plausibility, based upon old and doubtful ground. Many, if not most, of the statements made in regard to this novelty are in themselves as irrational and as absurd as any of either domestic or foreign origin since the time of Broussias.

The above mentioned paper was read at a meeting of prominent surgeons, and it and the treatment were discussed, and on the whole the treatment received no support that would be very satisfactory to the author of it. But the remarkable feature of the discussion was, that so far as the published account of it goes, no allusion whatever was made to the irrationality, absurdity and inconsistency of the grounds and statements upon which the treatment was based and was tried. Tacitly, at least, and by fair inference, it seemed to be admitted that there is little or no principle underlying treatment of pathological conditions hitherto difficult to manage, but that "any plan * * * which claims to help us * * * is deserving of a hearing."

Throughout the paper and the discussion it is easy to see that this particular absurdity was accepted with distrust, and "damned with faint praise;" but the wonder still is that a high degree of professional intelligence and reason should ever have permitted it to be accepted at all, and this leads directly to the moral involved in all such medical history.

In the light of such action as this, which is constanly repeated, the medical profession cannot justly condemn the less intelligent laity for empirically trying all the quackeries that are proposed to them. Such an irrational "plan of treatment" as this, presented in such a way, is to the profession an almost exact analogue to "Pond's Extract" to the laity. Both claim to be effective for good, and although there is but little reason or intelligent support for either, still let them be tried lest something useful should escape by being irrational.

Whether it be a variety of turpentine that only one man knows, or a carbolic acid that only one man makes, or water from witch hazel twigs that only one man can distill, the principle or want of rational principle is the same, and the inconsistencies are the same. If the profession weakly lends itself to try every plausible novelty that may be presented to it without first inquiring closely whether its pretensions be rational or not, or be supported by the known relations between cause and effect, then it cannot justly blame the people for persistently trying one so-called system of medicine after another, and one patent medicine after another throughout the long list of hurtful, popular errors. Neither can the profession hope to make progress in its battle for life against such error from so weak a position.

At a Grecian council of war, upon the demoralization of the Greek leaders, held after Troy had been unsuccessfully besieged for seven years, Ulysses is represented to have said to Agamemnon—

> "And 'tis this fever that keeps Troy on foot,
> Not her own sinews. To end a tale of length,
> Troy in our weakness stands, not in her strength."

PREPARATIONS OF ACONITE.

The tendency of the past few years to increase the number of the preparations of this among other very important and very active drugs, is very confusive and very unfortunate. One or two alternatives or duplicates each, for internal and external uses, should be sufficient for each active medicine, and then these should be easily understood and their relations of strength could be easily remembered. In the case of aconite some of the confusion has arisen from changing the source of the preparations. Many years ago, when the leaf of the plant was alone used, it was shown that this part of the plant was much more variable in strength and more perishable than the root, and this was a very good reason for the change which then began, from the leaf to the root, and now preparations of the root are commonly used, but, unfortunately, those from the leaf are not yet entirely abandoned as they should be.

Then the alkaloid aconitia came into use, at first for external application only. But the use has very largely increased, and it is now given internally to a very considerable extent. Gradually the alkaloid of several prominent makers came into the market, and these were soon found to be of very different degrees of strength and untrustworthy and unsafe; and in all statements of dose or effects the particular maker had to be given, the average dose varying all the way between the $\frac{1}{4}$ and the $\frac{1}{24}$ of a grain. Then again, the very strongest of these when the dosage was compared with that of the root, bearing no apparent relation, the root being far stronger, or the alkaloid far weaker in effect than ought to be from what was known of their relative alkaloidal value.

Then again, the relation of strength between the leaf and the root has been left unsettled. Statements are to be found, by good authorities, that they are equal in strength, and Stillé and Maisch (see The National Dispensatory, 1879, p. 97), give the minimum dose of powdered leaves or root as one or two grains, as though they were of the same strength. On the other hand Bently and Trimen (see Medicinal plants, Vol. I, No. 6), make the following statement: "Aconite root is by far the most active part of the plant; it is said to have six times the strength of the leaves." From these extremes many intermediate comparisons are to be found, and the writer up to this time has accepted the statement that the root was one-fifth stronger than the leaf, but now finds this to be a great and important mistake.

Of course all the preparations from the leaf have been duplicated in those from the root as the latter have come into use, and one or two have been added, so that the confusion has been and still is very great and dangerous.

There is now, in not very infrequent use, a powder, fluid extract, extract and tincture of the dried leaf, and an extract of the green or undried leaf. Then there is in more common use a powder, fluid extract, extract and four tinctures of very dissimilar strength, made from the dried root, and all these from the common officinal variety, the Aconitum Napellus. Then there are at least four very different aconitias or aconitines in common use in this country, and one or two more in Europe. There are, first, the ordinary "aconitia" or "aconitia," sold by one or more prominent manufacturers of chemicals in this country, but generally supposed to be imported from Germany. Second, the aconitine made by Merck, of Darmstadt, and bearing his label. This is largely sold and is supposed to be made from the A. Napellus. The same maker sends out an aconitine at more than three times the price of the first, labelled "Aconitine from Himalaya Root," probably from the A. ferox. Then Duquesnel, of Paris sends out an aconitine which is in well-formed, colorless crystals, at about three times the price of the last. That is, the first aconitine costs about $14.00 an ounce avoirdupois. That of Merck costs about $13.50 an ounce. The second of the same maker, about

$40.00 an ounce, and that of Duquesnel about $105.00 an ounce, or $3.75 per gramme, by wholesale.

It is the general object of this note to ascertain the strengths of these various forms in which this important medicine is used, and to compare them so that equivalent doses may be known, thus endeavoring to clear up some of the dangerous confusion of dosage as it is now found in the books.

In order to do this in the simplest way, a standard of strength must be adopted by which to measure all the preparations; and the process by which the strength of the standard is obtained must be applied to all.

The best standard would of course be the proportion of aconitia, as that is the most important, though perhaps not the only useful active principle. But aconitia is in such very small proportion that no process of assay as yet prepared is practically applicable, or within the ability of the writer to apply. Besides, as will be seen later, aconitia as met with, is quite as variable as the preparations of aconite, and this probably from different processes of extraction as well as from different species of aconite.

Some years ago (see Proceedings of The Amer. Pharm. Asso. for 1872, p. 229,) the writer published a note on Aconite Root, in which he gave a very easy test of the value of the root. At that time by careful selection bales of aconite root could be found in which, from an ordinary handful sample, eight roots out of ten, when broken at about the middle of the root, and a very small fragment bitten off and chewed for a moment between the front teeth, and in contact with the tip of the tongue, would give the peculiar aconite tingling sensation to the tongue and lips. This would be perceived within a few minutes and would continue for a longer or shorter time in proportion to the size of the piece taken, and the strength of the root, as no two roots have precisely the same activity. This simple mode of testing has now served the writer well for some fifteen years past, and in 1872 eight pieces out of ten was a pretty high standard to adopt, but for two or three years past it is not uncommon to find bales in every large lot, of which every piece will give the distinct aconite tingling or numbness in some degree, and any one can get such an aconite root who will take the time and pains to select it. Therefore such root is now adopted as the standard for the purposes of this paper, and this physiological measurement of the strength is also adopted. Of course the taste or impression as a measure of strength cannot pretend to be very accurate, nor indeed accurate at all, but it is a very useful measure, and will serve all the practical purposes of the physician and the pharmacist. It is very highly probable, though of course not quite certain, that any aconite which does not give this sensation of tingling and numbness to the tongue, lips and pharynx is inert, and that the activity is in direct proportion to the amount or degree of the sensation from a given uniform quantity. Any bale of aconite root, every piece, or nearly every piece of which gives the tingling in some degree, must be powdered in order to get any fair average, and therefore it is the powder that must be adopted as the standard. But the powder is difficult to manage and to subdivide properly, and so its liquid equivalent, the fluid extract, is much better. A fluid extract well made by repercolation, and without heat, from such root, so as to represent the powder in the proportion of a minim to each grain, forms an excellent standard. It has become fashionable of late to add an acid and glycerin to the menstruum in making this fluid extract, but as they are neither necessary not useful they are objectionable, alcohol alone serving all the purposes of complete exhaustion and preservation of the active principles. Any well-made fluid extract of good aconite root if added to water in the proportion of one part to six hundred, or one-tenth of a minim in a fluidrachm, will give a distinct aconite impression to the tongue and mouth under the following conditions:

Put 12.5 fluidounces or 369 cubic centimetres of water into a proper vessel and add to it, from an accurate pipette, 10 minims or ·616 cubic centimetre of the fluid extract of aconite root; stir well, and allow it to stand covered for an hour. This forms a cloudy solution or mixture from which, however, nothing settles out.

If now the mouth be rinsed out well to free the surfaces from mucous and saliva, and a fluidrachm or 3.7 cubic centimetres of this solution be taken into the anterior part of the mouth, and be held there in contact with all the surfaces for one minute by the watch, and be then discharged, no immediate sensation will be felt. But within fifteen minutes a distinct aconite sensation, not amounting to tingling, but very suggestive of it, will be felt and will continue for a quarter or half an hour in greater or less degree. The sensation, though distinct, is not pronounced, and if the attention was taken by other matters it would escape unnoticed. Any good fluid extract of aconite root should stand this test. When one is met with which does not stand it, it may be systematically diluted to a lesser degree until the sensation is reached, and then the amount of dilution will approximately measure its shortage in strength. Negative results being obtained, the second trial should be with one-fourth or one-third of a minim to the fluidrachm, and then a less or a greater dilution from the indications thus obtained. This is the principle adopted for the comparison of all the preparations of aconite and for aconitia, which are now to follow. It was found by repeated trial upon three individuals that such a fluid extract when diluted in the proportion of one-third of a minim to the fluidrachm, or 1 part in 180, when used in doses of a fluidrachm, gave a pronounced impression which commenced in about 5 to 10 minutes, increased for three-quarters of an hour, and was practically at an end in 1.5 hours. This made a very convenient dilution for comparison, and was therefore adopted as the general standard for comparison.

Powdered aconite leaf with all the sensible properties of a good article was obtained from a good source, and was carefully made into a fluid extract representing the powder in the proportion of minim for grain, the same menstruum being used as for the root, namely, stronger alcohol. The dilutions of this had a mawkish as well as a bitter taste, were slow in producing their impression, and the impression made was different in kind from that of the root, and getting into the throat gave a greater sense of constriction and desire to swallow repeatedly. The fluid extract being much more loaded with chlorophyl and albumenoid matters than that of the root it would naturally act upon the mucous surfaces more slowly, and with a somewhat diminished activity for the same strength of active principle. Making a fair allowance for this, the comparison of the fluid extracts showed that three minims of that from the leaf was about equal to one-third of a minim of that from the root. This makes the strength of the leaf to the root as measured in this way as 9 to 1, or makes the root nine times stronger than the leaf. This was very unexpected, and therefore the trials were repeated on different persons, and the conditions of the trials were carefully re-examined, but the results being tolerably uniform were accepted.

Then, if these results are trustworthy, the ordinary dose of the fluid extract of the root being one minim, the equivalent dose of the fluid extract of the leaf would be nine minims, and this is probably the proper relation.

Next 100 c.c., equal to 1623 minims of the fluid extract of aconite root, which is equal to 1623 grains of the powdered root, and weighs 88 grammes, was evaporated to the condition of a solid extract of which it yielded 15 grammes, or about 232 grains. This, calculated upon the powder represented, is 14.3 per cent. From this it is shown that the dose of the solid extract of aconite root which corresponds to one minim of the fluid extract and to one grain of the powder is, ·143 grain, or a little over an eighth (·125) of a grain, provided there be no loss of activity in the evaporation. But that there is always such a loss is well known, so that the equivalent dose is really greater in proportion to this loss. The U. S. Dispensatory gives the dose of this extract as one-sixth to one quarter of a grain three times a day. The National Dispensatory gives one-sixth to one-third of a grain, and thus neither are out of the way.

Then 100 c.c. equal 1623 minims of the fluid extract of the dried leaf, equal to 1623 grains of the powdered leaf, and weighing 86.8 grammes, was evaporated to the condition of a solid extract, of which it gave 15 grammes, or 232 grains, or 14.3 p.c. of the weight of the powder.

Now, if the dose of the extract of the root be one-sixth to one-quarter of a grain, the equivalent dose of this extract of the dried leaf would be nine-sixths to nine-quarters of a grain, or one and a half to two and a quarter grains. This is a somewhat stronger preparation than the officinal " Extractum Aconite " of the U. S. P., and the U. S. Dispensatory gives the dose of the officinal extract as "half a grain or a grain to be gradually increased if necessary," and The National Dispensatory gives the same dosage. This, as will be seen, is just about one-third of the proper dose equivalent to the dose they give of the extract of the root, and would doubtless be proportionately inefficient.

The British Pharmacopœia extract of the "Fresh Leaves and Flowering Tops of Aconite" cannot be compared with the above for want of proper data. The U. S. Dispensatory gives the dose of this preparation as one or two grains night and morning, and says that as much as twenty grains or more have been given in the course of a day. The National Dispensatory gives the dose as half a grain to a grain. A pot of English extract labeled "Extractum Aconite, manufactured by George Allen & Co.," the word "leaves" being written on the wrapper in pencil, was bought for trial. This is supposed to be the officinal extract of the British Pharmacopœia. The appearance of the extract is good, and it is of proper pilular consistence. On careful comparison, a half grain of this extract dissolved in a fluidrachm of water was just about equal in effect to half a minim of the standard fluid extract of the root in the same quantity of water. So also the tenth of a grain of it gave about the same impression as the tenth of a minim of the fluid extract.

The stated dose of the U. S. Dispensatory for this extract is, therefore, not far from correct, while the dose given in the National Dispensatory is one-half too small.

The next preparation still not uncommonly used is a tincture of the leaf, and when "tincture of aconite" is written or asked for, this is the preparation that is always dispensed by the careful pharmacist, though in most cases it is probably not what the physician wants. There is no authorized formula for this tincture in the principal pharmacopœias, it having been dismissed from them all. In the U. S. Pharmacopœia of 1860, the tincture is directed to be made of the strength of two troyounces to the pint. This is eight minims of tincture to each grain of powdered leaf. And as the root is nine times stronger than the leaf, the eight minims of this tincture would be represented by one-ninth of a grain of the powdered root, or one-ninth of a minim of the standard fluid extract of the root. Then, as a minim of this fluid extract is the standard dose, the equivalent dose of this tincture of the leaf would be ($9 \times 8 =$) 72 minims, or 1.2 fluidrachms. This completes the commonly known preparations of the leaf.

Of the preparations of the root, the powder, fluid extract and extract have been considered. The four tinctures of aconite root in common use are, first, that of the U. S. Pharmacopœia, which is six troyounces to the pint. This is 2.66 minims of the tincture to 1 grain of powdered root, or 1 minim of fluid extract of the root.

Second. The tincture of the British Pharmacopœia, which is two and a-half avoirdupois ounces of powdered root to one imperial pint. This is (437.5 grs.$\times$2.5=) 1093.75 grains of powdered root in 9218 minims of the tincture, or about 8.434 minims of the tincture to 1 grain of the powdered root, or 1 minim of fluid extract of the root.

The tincture of the German Pharmacopœia is one part by weight of the comminuted root to ten parts by weight of diluted alcohol, s. g. ·892. Diluted alcohol of ·892 s. g. weighs 6506 grains to the pint of 7680 minims. Therefore this tincture would be made from 650.6 grains of the powdered root to 6506 grains of the diluted alcohol, and the product would be 7680 minims of the tincture. Then each grain of the powdered root would be represented by (7680 $\div$ 560.6=) 11.8 minims of the tincture.

Fleming's tincture of aconite root as given in the U. S. Dispensatory, page 1492, foot note, is made so that 16 troyounces of powdered root is nearly represented by 24 fluidounces of the tincture, which is in the proportion of 1.5 minims of the tincture to 1 grain of the powdered root or 1 minim of the fluid extract.

Compactly stated, the approximate equivalency is as follows: one grain=65 milligrammes of powdered aconite root of good quality, equal to one minim=·0616 c.c. of well made fluid extract of the root is represented in

Alcoholic extract of Aconite Root, by	$\frac{1}{6}$th grain	=	11 milligrammes.
U. S. P. Tincture " "	2.66 minims	=	·164 cubic centimetre.
Br. P. " " "	8.434 "	=	·520 " "
German P. " " "	11.8 "	=	·727 " "
Fleming's " " "	1.5 "	=	0924 " "
Powdered Aconite Leaf....................	9 grains	=	·583 gramme.
Fluid Extract of Aconite Leaf............	9 minims	=	·554 cubic centimetre.
Alcoholic Extract of dried Aconite Leaf..	1.5 grains	=	99 milligrammes.
English Extract of fresh Plant, Allen's......	1 grain	=	65 milligrammes.
Tincture of Aconite Leaf	72 minims	=	4.44 c. centimetres.

Therefore, if one minim of the fluid extract be the commencing dose the columns represent the equivalent doses of all these preparations, provided the preparations be properly made from good material.

The same physiological test was applied to the four aconitias which are commonly used in this market, and the same standard was adopted in judging of their relative strength, namely, one minim of fluid extract of aconite root equal to one grain of powdered root. As before, the fluid extract was so diluted that each fluid-drachm or 3.7 cubic centimetres represented one-third of a minim of the fluid extract, and a fluidrachm of this dilution was used for each trial, this being the quantity which gave a full strong impression, the duration of which was about an hour and a-half. The quantities of aconitia were all dissolved in this same quantity of water, and the impressions made were compared both in intensity and in duration by repeated trials. The primary solutions of the aconitias were at first made by dissolving one grain, equal to 65 milligrammes of the aconitia, in 50 cubic centimetres of water. In using these solutions it was discovered that they deteriorated very rapidly and diminished in strength after the second day. In four days, the weather being very warm, they were quite inert, giving no impression at all. Floating shreds of mycelium were noticeable at times on the second day. The dilutions of fluid extract became inert quite as quickly as those of the aconitias, and it was very striking to observe that a dilution which would give a distinct impression one day might give none whatever on the next. The growth of the cryptograms appears to be a measure and the cause of the decomposition. Hence the indication is very plain that in the use of all such solutions for medicinal purposes, as well as for testing, they should be freshly made every day, or at most every two days, unless something be added to preserve them.

The best and almost the only definite authority found for the proportion of aconitia in aconite root, was C. R. Alder Wright, D Sc., Lond., whose investigations of the alkaloids of aconite were very thorough. In a paper contributed to the British Pharm Conference, and published in the "Year-book of Pharmacy" for 1876, at p. 539, this author states that he obtained ·03 per cent. of pure aconitia from the root and 0.07 per cent. of total alkaloids, crystalline and non-crystalline. He states the probability that upon a larger manufacturing scale, where the mother-liquors could be carried along to a better exhaustion, the yield might be increased to ·04 per cent. of pure aconitia. It may, however, be inferred from what he says, that there is a considerable loss from splitting up of the aconitia into other bases, even from the best process of extraction, namely, that of Duquesnel, and it may be possible that all the bases existed in the root as aconitia. For the purposes of this paper this possibility will be assumed, and ·07 per cent. will be accepted as the proportion of aconitia in good root, although this is about double the quantity really obtained in working 224 lbs. of the root.

Upon this assumed strength of root, one grain or the powder, or its liquid equivalent one minim of fluid extract, will contain seven ten-thousandths of a grain of aconitia (.0007). Then as one-tenth of a minim of the fluid extract gives a distinct aconite impression in the mouth, it follows that a tenth of seven ten-thousandths of the alkaloid, or seven hundred-thousandths (.00007) of a grain of good aconitia should give an equivalent impresion. But, as will be seen hereafter, this is so very far from being the case as to be outside of all probability of either error in calculation or error in degree of impression made.

The standard dilution for comparison adopted here is one-third of a minim of fluid extract diluted to one fluidrachm, and this, by the assumption of 0.07 per cent. of aconitia in the root, is equivalent to, or should contain ·00023 + grain, or say, for simplicity of expression, three ten-thousandth (·0003) of a grain. Then it fellows that a fluidrachm or 3.7 c. c. of water containing 0.0003 grain of pure aconitia should give a distinct full impression in the mouth of the duration of about 1.5 hours, which is very far from being the case, even with the strongest aconitia.

The following varieties of aconitia of the market were tried with the results stated :

There is no maker of aconitia in this country known to the writer. The first aconitia tried bears the label of a well-known manufacturing house of this country, but it is believed that they buy what in their judgment is the best they can get in Europe, and then put it forth with their own label. Unfortunately, this is the aconitia which the writer has been ignorantly buying and using for more than a year past to make oleate of aconitia, and consequently the oleate has been proportionately worthless. Two grains = ·130 gramme of this aconitia was dissolved in 50 c. c. of distilled water acidulated with ·2 c. c. of acetic acid. The trials were commenced by taking 1 c. c. = $\frac{1}{25}$ of a grain of aconitia, diluting it with distilled water to 1 fluidrachm = 3.7 c. c., and, under the conditions before described, holding it in the mouth for one minute. No impression was obtained until the dose reached 4 c. c. = $\frac{1}{6}$ of a grain, and then the impression was hardly stronger than that from one-tenth of a mimim of the fluid extract, and certainly no stronger than that from one-sixth of a minim of fluid extract. Therefore this aconitia, costing $14 per ounce, is but just the aconite strength of a well-made fluid extract. Its solution, however, was so very bitter as to show that one or more other alkaloids were present, and it is possible that it mainly consists of a decomposition product named by Wright "picraconitine," from its bitterness. (See "Year-Book of Pharmacy" for 1877, p. 466.) This aconitia would have been tested farther but that the bitterness caused such a flow of saliva as to change the conditions of the trial.

The next variety of aconitia tried was that of Merck, of Darmstadt, the parcel used having been obtained from a trustworthy source here. The solution was made of double the strength of the last, namely, $\frac{1}{50}$ of a grain = 1.3 milligrammes to each c.c. Of this solution 2 c.c. gave an impression similar, but not stronger than that from one-third of a minim of the fluid extract, and, therefore, 6 c.c=$\frac{6}{50}$ths=$\frac{1}{8}$th grain of the aconitia was the equivalent to one minim of fluid extract, or it was found to be about eight times stronger than the first aconitia. Its solution was bitter, but not nearly so bitter as that of the first; and it required ·12 grain of it to give the impression made by ·0007 grain of the aconitia as present by calculation in one minim of the fluid extract.

The next variety tried was also made by Merck, and was labeled "From Himalaya Root." This, if from the A. ferox, as is probable, would be called by authors on this subject not aconitin, but "pseudaconitin," which is considered to be a different alkaloid. The solution of this for testing was made double the strength of the last, namely, half a grain to 50 c c of water and ·2 c.c. of acetic acid, so that each c c. of the solution represented ·01 grain or ·65 milligramme. Of this solution one-tenth of a cubic centimetre (·1 c.c.) represented one-thousandth (·001 grain) of a grain, and this quantity in one fluidrachm of water gave an impression that was very difficult to detect. With ·2 c.c. in the same dilution the impression was decided and continued for an hour or more. With ·4 c.c. the impression was about equal to ·33 minim of the fluid extract, and therefore (·4 c.c. + 3=) 1.2 c.c. was about equivalent to (·33m + 3 =) 1 minim of fluid extract. Therefore ·012 grain of this pseudaconitin is equivalent in physiological impression on the mouth to 1 minim of fluid extract. But the impression from this was different in kind from all the others, having less tingling and somewhat more of a peppery heat in it. It came on later than the others for the same degree of impression increased and decreased more slowly, and was of longer duration. As ·012 grain was equal to one grain of powdered root, and as this latter contains about ·0007 grain of aconitia, it follows that the alkaloid in its natural condition in the root is much more powerful than when separated. It is just about ten times stronger than the last aconitia, or the ordinary aconitin of Merck.

The next variety tried—and the last—was that of Duquesnel, labeled "Aconitine Cristallisée, H. Duquesnel." This is in distinct crystalline form, while the others appear to be amorphous, and is quite colorless, while the others are nearly white, excepting that from the Himalaya root, which is decidedly yellowish, and gives a solution of a yellow tinge.

The aconitia of Duquesnel was soluble in water, and the solution for testing was therefore made without acid, and like the last of the strength of half a grain, or 32.5 milligrammes to 50 c.c. of water. Therefore each cubic centimetre of the solution represented one-hundredth of a grain, or ·65 gramme, and each tenth of a cubic centimetre represented one thousandth of a grain, or ·065 milligramme, and this latter quantity diluted to one fluidrachm with water gave a distinct though feeble impression in the mouth, generally at the tip of the tongue, going off in a quarter or half an hour. A dose of ·3 c.c. = ·003 grain, or ·195 milligramme gave an impression just about equal to that from one-third of a minim of fluid extract. Therefore ·009 grain was equal to one minim of fluid extract or one grain of powdered root. But the one grain of powdered root contains only ·0007 grain of aconitia, and yet nearly thirteen times as much of this aconitia of Duquesnel is required to make the same impression on the mouth.

Aconite root should yield about nine-tenths of one per cent. of aconitia in order to be in physiological equivalency with this aconitia of Duquesnel, but it really yields only about seven-hundredths of one per cent. at the most, or about one-thirteenth as much.

This want of accordance in strength between the root itself, or the aconitia as it exists in the root in its natural condition, and this strongest of all the aconitias, is very remarkable and is inexplicable, but it certainly shows that there is great therapeutic as well as pecuniary economy in the use of the powdered root or its fluid equivalent, while the difference in strength between these aconitias shows that accuracy in dosage and in medication is altogether in favor of the root.

The impression made on the mouth by this aconitia of Duquesnel is very different from that of either of the other aconitias, and from that of the root. It is a more simple or less complex sensation, and seems to be the tingling element which exists in a less degree in all the others, and least of all perhaps in the pseudaconitia which is farthest from this in the kind of sensation. The impression from the Duquesnal aconitia begins promptly,—almost at once,—while that from the pseudaconitia is delayed to five or ten minutes. The impression increases rapidly and is strongest about the tip of the tongue, has but a short period of maximum impression, diminishes rapidly, and from small doses is very soon over. That from pseudaconitia increases slowly, is felt of nearly equal strength all over the surfaces of contact, has a long period of maximum degree, and diminishes so slowly that from a standard dose no more than two trials can be made in a day. The impression from the fluid extract and from the other aconitias is pretty plainly a mixture of the impressions from pseudaconitia and the aconitia of Duquesnel.

The relative strength of these four aconitias, as deduced from these trials, and as compared with one grain of the powder of good aconite root (German) is as follows:

Aconitia of unknown make,	1 grain	= 65	milligrammes	=1	grain of	powder.
" " Merck, ordinary,	$\frac{1}{8}$th "	= ·8	"	=1	"	"
" " " Pseudaconitia.	$\frac{1}{83}$d "	= ·78	"	=1	"	"
" " Duquesnel,	$\frac{1}{111}$th "	= ·59	"	=1	"	"

The relative strengths therefore are, 1 : 8 : 83 : 111. That is, the second is eight times stronger than the first; the third is ten times stronger than the second, and eighty-three times stronger than the first; the fourth is one-third stronger than the third, fourteen times stronger than the second, and one hundred and eleven times stronger than the first.

The doses of aconita quoted in the United States Dispensatory are from the $\frac{1}{130}$ to the $\frac{1}{333}$ of a grain three or four times a day.

The National Dispensatory says that in view of the varying strength of aconitias, the primary dose should not exceed the $\frac{1}{256}$ of a grain two or three times a day.

In a report by Dr. E. C. Seguin on the use of Duquesnel's aconitia in trigeminal neuralgia, his dosage varied between $\frac{1}{96}$ and $\frac{1}{140}$ of a grain three, four and six times a day, according to circumstances.

As other authorities vary as much as those above quoted, it is evident that the confusion here is quite as great as in the preparations of the leaf and root.

In the use of aconitia for medical purposes it would seem to be essential that it should first be tested, and as this physiological test is simple and easy and within the reach of all, it seems better adapted to general use than chemical testing, and two or three graduated pipettes will enable any one to apply the test. No aconitia should be accepted which will not give a distinct impression from $\frac{1}{800}$ of a grain, or ·08 milligramme diluted to the measure of one fluidrachm or 3.7 c.c. This is not too high a standard, for the reason that the aconitia of Duquesnel will give the impression from $\frac{1}{1000}$ of a grain or ·065 milligramme. The dose of such aconitia to begin with need not be smaller than $\frac{1}{100}$ of a grain, or ·65 milligramme, three times a day, given in solution diluted to four fluidrachms or 15 c.c. and always on an empty stomach. Should no effect be obtained within 24 hours the intervals between the doses should be shortened, first, to 4 hours, then to 3, before the dose is increased. If the commencing dose be $\frac{1}{200}$ of a grain, the first intervals should be shorter, say every 3 hours. The solution should be swallowed with as little contact with the mouth as practicable if the sensation there is to be avoided. But if used for trigeminal neuralgia, the mouth impression should certainly not be avoided, but should rather be sought for and be made as strong as possible.

For external use there is probably no form better or more convenient than an oleate of aconitia, made by dissolving two grains, or 130 milligrammes in 98 grains of oleic acid. A fluidounce of oleic acid weighing 412 grains requires 8.25 grains of aconitia to make a 2 per cent. solution. Each minim of this oleate contains ·0172 of a grain or about $\frac{1}{60}$ of a grain, and this quantity applied locally and repeated according to circumstances, should be an efficient dosage, and should in a short time produce constitutional effects by its absorption. It should be applied to the surface by the cork of the vial, or by some non-absorbent, without friction, and about the head and face needs no covering; and great care must be taken that it does not get into the eye. In using it around the eyes this caution must never be forgotten. If applied under the clothing it should be covered with oiled silk or rubber tissue. Local neuralgias are much better reached by the dermic or epidermic method of treatment.

One hundred drops of the oleate make a fluidrachm when dropped from an ordinary half ounce vial, thus making a little more than 1.5 drops to the minim. One drop spread by a pin or by the cork of the vial will easily cover a square inch of surface without spreading much farther afterward, and in ordinary conditions of the healthy skin will be absorbed within a quarter of an hour, so that the dose may be repeated on the same place.

As a general result of these trials the conclusion can hardly be avoided that a well made fluid extract of aconite root, made by repercolation with alcohol alone from good root, is the best and only preparation needed. It is accurate and uniform and easy to manage accurately in dosage, and is relatively the strongest of all known forms in which the drug can be used. For these and many other reasons it should take the place of all the other preparations, and perhaps also that of all the aconitias.

Each parcel of it as bought by the pharmacist or the physician should be tested, and if one-tenth of a minim of it, diluted with a fluidrachm of water and held in the mouth for one minute does not give the aconite impression within ten minutes, the parcel should be rejected, or its strength should be obtained, and doses increased accordingly.

That is, if double this quantity in the same dilution should be required to give the slight but distinct impression, then the dose should be doubled.

It is best used at the bedside in the following way: A household teaspoon is called for, and ten tea-spoonfuls of water are measured with it into a wine-glass or small cup. Then ten minims of the fluid extract are added from a minim pipette, and the mixture is well stirred. A tea-spoonful of this represents a minim of the fluid extract, if measured with the same spoon, and this dose, if not given oftener than every three hours, will about use up the mixture in the 24 hours, until the next visit, when a fresh mixture should be made, and the dosage varied according to circumstances. The tea-spoonful dose should be put in a wine-glass, and about two tea-spoonfuls of water added before swallowing to avoid too strong an impression upon the fauces. A mouthful of water immediately after the dose is also useful in moderating the local impression.

The fluid extract may also be efficiently used externally by allowing successive drops to evaporate from any surface until the desired dose is reached, and then keeping the surface moist, that absorption may take place.

This fluid extract, when of good quality, is an exceedingly potent preparation, and so dangerous that extreme caution is needed, not only in its use, but also to prevent accidents and mistakes. In prescriptions the full title, "Fluid Extract of Aconite Root," should always be used.

BISMUTH BREATH.

When preparations of bismuth are given, a moderately close observation and a good sense of smell will detect a garlicky odor in the breath in perhaps as many as one case in ten; and in one case in a hundred the odor will be so marked as to attract attention at some distance from the patient, while in rarer instances it is so strong as to be quite disagreeable to every one around and even to the patient. A person in whom this odor occurs once will generally have it in some degree every time bismuth is taken, but the degree will vary, or it may, rarely, be absent altogether. It commonly occurs very soon after the first dose, and persists for a few hours after the last one. When slight in degree it disappears during a part of the interval between the doses, but when at all pronounced it is continuous throughout the administration of the bismuth.

The odor has often been attributed to arsenic in the bismuth, because the garlicky odor is like that of some arsenical compounds, and the opinion is supported by the fact that all preparations of bismuth contain a greater or less proportion of arsenic. Even the U. S. Pharmacopœia process when well managed yields preparations containing an average of about one six-thousandth part of arsenic. But that it is not due to arsenic has been proved by its occurrence from bismuth preparations which were absolutely free from arsenic. There is, beside, much other evidence against the arsenic theory. For instance, no ordinary preparations of arsenic when given produce this effect. Again, the proportion of arsenic in the officinal preparations of bismuth is too small to produce the effect, even if it was an arsenical effect. Next, the same parcel of bismuth only gives the odor say in one case out of ten to which it is given. Next, other substances containing no arsenic, nor in any way related to bismuth, give the same or a similar odor to the breath. As mentioned above, it is said, as a rule, that persons once affected in this way by any preparation of bismuth will always be so affected by all preparations of bismuth, yet one case has been reported to the writer wherein the same parcel of subnitrate of bismuth produced it to a marked degree in one person at one time, yet failed to produce it in the same person at a subsequent attack needing bismuth a few months later.

As some compounds of tellurium give a similar garlicky odor to even a more marked degree as chemical compounds out of the body, the odor has been charged to tellurium in the bismuth. But tellurium has been repeatedly sought for in vain in preparations of bismuth which gave the odor, and there is no known record of tellurium when given yielding this odor of breath.

The cause of the occasional garlicky breath from taking bismuth preparations is, therefore, not known up to this time, though it is pretty conclusively shown not to be due to either arsenic or tellurium as contaminations of the bismuth.

ADULTERATION OF BISMUTH SALTS.

A sample of so-called subnitrate of bismuth was recently sent for examination, having been sold in a paper parcel by a wholesale drug house of New York as the product of a respectable maker, and with the maker's name on the label.

From the depth of the yellow tinge it was evidently not a proper subnitrate, and was supposed to be subcarbonate, but as it did not effervesce with an acid it was not a subcarbonate. It contained a number of very small hard lumps, which, when broken or rubbed to powder, were lighter in color than the pulverulent portions. Both powder and lumps had a very decidedly saline taste, but the lumps were more saline than the powder, and they seemed to melt on the tongue. The whole, when well washed with distilled water, gave a solution which was not affected by hydric sulphide (sulphuretted hydrogen), and therefore contained no bismuth. But it should have contained bismuth had there been any nitrate or other soluble salt of bismuth present. A weighed portion of the washings evaporated to dryness left a residue amounting to about 30 per cent. of the weight of the original sample. This residue was neutral and contained nitric acid and soda, and was probably nearly all nitrate of soda. The sample, therefore, consisted approximately of say 70 per cent. oxide of bismuth and 30 per cent. nitrate of sodium, without any subnitrate of bismuth at all, although sold under that name. It seems to have been made by precipitating a solution of nitrate of bismuth by a solution of soda, and by separating and drying the precipitate with little or no washing.

Now, this was ordered in paper as the subnitrate of bismuth of a specified manufacturer, and was sold by one of two wholesale druggists, who attract much trade by low prices, but who do not themselves manufacture anything, so far as is known. Such, however, in order to sell at low prices, must buy at correspondingly low prices to preserve their profits. It is probable, therefore, that such a product as this was bought as a "job lot" from some irresponsible seller who made it, or had it made, as a bad counterfeit of the manufacturer whose name it bore, and if bought cheaply enough it was not to the interest of the wholesale house who bought it to inquire too closely as to its genuineness or its true character.

The dispensing pharmacist who buys and dispenses such articles shares about equally in the criminality with the wholesale house and the maker, because he goes to such houses voluntarily for the sake of buying cheaply. He buys in paper parcels for the sake of avoiding the cost of a bottle, which is not only necessary for the proper preservation of most medicines, but which aids materially in identifying the product of any maker. And finally, he dispenses such products without exercising the knowledge which he should, and generally does possess of discriminating between a good preparation and one which is grossly adulterated—in this case so grossly that a mere casual inspection was sufficient to detect the fraud.

Many pharmacists are led into such purchases as this by insisting upon having their preparations put up in paper parcels. They have shop bottles for their preparations and cannot see the necessity of buying a bottle each time they require a new supply. Therefore they will buy of those houses and of those manufacturers only who will put their wares up in paper. No known manufacturer of bismuth salts willingly sends out his product in paper, but all do it under a kind of tacit protest under the pressure of the pharmacist and physician, and thus the remote consumer, namely, the patient, suffers in consequence.

It is true that the bottle and label does not guarantee the contents, because all manufacturers know that their labeled empty bottles are often refilled with products for which they are in no degree responsible. Yet as this fraudulent buying up and refilling of labeled bottles is much more difficult and involves much more risk, it is less frequently done. Consequently there can be no doubt that if pharmacists and physicians would refuse to take, or would even cease to demand important medicines in paper parcels, they would be much less frequently deceived in the character of their supplies. and they would thus admit what they ought to know better than any manufacturer, that all medicines which are made with due care and accuracy are well worth the containing vessel necessary to keep them in their original condition as made.

It is a common fallacy that inexpensive articles should always be put in paper, and hence alum, muriate of ammonia, chlorate of potassa, sulphate of zinc, etc., are very commonly ordered in paper, whereas they are in reality of as much value as medicines as are the bismuth salts and other more costly articles; the circumstance that the bottle costs half as much as the contents being merely incidental.

The habit of ordering important medicines in paper is rapidly increasing, and as it increases with physicians as well as with pharmacists, it is fair to infer that the mistake is upon both, while the blame is greatest upon the physician who is most directly responsible in the application of medicines. And if the physician would but use his influence earnestly against it, the practice would soon cease altogether. If he will not do this there will then be need for some manufacturer who will lose the sale of his medicines rather than put them up in paper.

No reasonable amount of care and expense are misapplied to medicines, and it is very disheartening to a manufacturer to see all his care, pains and pride in his productions risked by putting them up in paper because pharmacists and physicians will not pay for proper containing vessels, but will send back articles and buy elsewhere if their orders for paper parcels be disregarded.

SOLUTION OF SUBSULPHATE OF IRON.

The officinal solution of subsulphate of iron, or Monsell's solution, often very erroneously miscalled "Solution of Persulphate of Iron," when accurately made by the present formula of the U. S. Pharmacopœia, is very liable to crystallize into a thick, whitish magma which cannot be poured from the bottles. This is commonly mistaken for a decomposition of the iron salt, or a gelatinzation which renders the preparation unfit for use. But if a little of the magma be examined with a glass of sufficient power, whitish interlaced crystals will be seen to constitute a large proportion of the mass. This is doubtless a definite iron salt and probably the one that is needed for the special uses to which this preparation is so well adapted, and, therefore, instead of being an evidence of spoiling or decomposition as is generally supposed, it is an evidence of the accuracy of the formula, and the skill with which it has been applied. Nevertheles it constitutes an objection to the formula as it stands, because by increasing the proportion of acid very slightly the preparation may not be materially injured, and the tendency to crystallize is almost or quite prevented. It is hoped that the Committee of Revision will have investigated this subject so that the forthcoming Pharmacopœia will have an improved process.

It is, however, very easy to restore the present preparation when it has thus accidentally crystallized. All that is necessary is to set the bottle in warm water or in a warm place until the crystals melt, and then the solution is exactly the same as it was before crystallizing, and then if the bottle be kept in a moderately warm place it may not again crystallize. As the magma in the bottle conducts heat very badly it takes more time to melt the crystals than can be well afforded when the solution is needed in haste, as it often is, to arrest bleeding, and, therefore, until the Pharmacopœia supplies a solution which will not crystallize, the dispenser should be careful to keep the present solution in a liquid state by melting it, and then keeping it in a moderately warm place. It is not probable that it will ever crystallize if kept above 20°C.=68°F., but when crystallized it does not melt easily or rapidly under 40°C.=104°F.

As the special value of the preparation depends upon its minus proportion of the sulphuric acid element, giving to it a maximum astringency with a minimum of causticity and irritant effect, it is very important in making it that the authorized formula should be closely adhered to, and therefore the surgeon who uses it should rather prefer than reject the specimen which will crystallize, because so far as it goes the crystallization seems to be an evidence that the caustic acid element which he wishes to avoid is not in excess. Therefore the question for the new Pharmacopœia to decide is—Can the crystallization be prevented by an increase of acid so slight as not to render the preparation practically more irritating, since its value depends upon its blandness as associated with its great efficiency as an hæmostatic. The writer has frequently seen the present preparation applied undiluted with great freedom to the peritonial surfaces during ovariotomy without causing inflammatory action; and the injection of hæmorrhoidal tumors and varicose veins with it, either diluted or undiluted, seems to be a comparatively safe procedure, when the solutions of the normal sulphate or of the chloride produce troublesome inflammation and ulceration.

CITRATE OF IRON AND QUINIA.

Complaint is very often made of the difficult solubility of the officinal citrate of iron and quinia of the U. S. Pharmacopœia, and it is very often erroneously said to be insoluble. Such complaints and statements are simply due to the faulty teachings in materia and pharmacy and faulty practice in therapeutics.

As long ago as the revision of the Pharmacopœia of 1860 it was recognized that the bitterness of quinia preparations, both to the palate and in the stomach, was in many cases destructive of appetite in sensitive patients, and therefore when given as a tonic this bitterness in a measure defeated the quinia. Hence a preparation of iron and quinia was adopted, containing a large and effective proportion of quinia, which when well dried, was so slowly soluble that it could be easily given, either in form of pill or powder, or suspended in syrup, to women and children, or in the most delicate conditions of palate or stomach, with but slight bitterness. Such a preparation passed over the palate easily, and when in the stomach dissolved and was assimilated slowly and easily with the least possible shock—for intense bitterness is as shocking and as disturbing to many stomachs as intense acidity or alkalinity is. This preparation, when taken between the teeth, feels almost like so much sand, and its solubility and bitterness are developed so slowly that although containing about eleven per cent. of quinia, it is often condemned as containing no quinia at all. And when stirred up with water it at once settles out, leaving the water colorless and tasteless, or nearly so, in proportion to the time allowed, and it is often at once discarded as useless, and letters written about it which have some of the bitterness in which it is supposed to be deficient, the fact being all the while that it is entirely soluble even in its own weight of water, but only very slowly soluble, as it should be and was intended to be. For a long time after its introduction to the Pharmacopœia it was used as was intended in powder, pill or syrup, and attained the high character which it has always so well deserved, but gradually through defective teaching or through want of thought, physicians began to make the mistake of prescibing it in solution. Then those physicians and pharmacists who had skill enough and patience enough to get it into solution by tying it up in a cloth and suspending it in the water and setting it in a warm place for some hours, found they had a dreadfully bitter solution, and one which in a short time became mouldy, as all salts with organic acids will. To avoid this slow and troublesome solubility and some of the intensity of bitterness, the manufacturers soon supplied a preparation by exactly the same name, wherein, by the addition of citrate of ammonia, a readily soluble salt of similar appearance with less bitterness was supplied at a lower price. Of course this contained a smaller proportion of both iron and quinia and a larger proportion of citric acid and water ; but this escaped attention so long as the preparation had the desired solubility, the diminished bitterness in solution, and was sold at a lower price. This new preparation, unofficinal, though called by the officinal name, was for a time designated as soluble citrate of iron and quinia—not so much for the purpose of indicating any difference of composition as for the purpose of distinguishing it in order so as to avoid the objectionable insoluble salt of the Pharmacopœia. But after awhile it almost entirely usurped the place as well as the name of the better preparation, and it holds these at this time so firmly that perhaps a hundred ounces of it are sold to one of the original officinal preparation, while the latter is really much more valuable, and as valuable, therapeutically, to-day as it was in 1860, when adopted by the Pharmacopœia ; and the reasons for its adoption are as good and as sound to-day as they were then, only the pecuniary profits upon it are less than on the more dilute and soluble preparation. So little is the better agent used now in proportion to the weaker one that in the present revision of the Pharmacopœia there was but a feeble opposition to the adoption of a formula for the weaker preparation, while some effort was needed to prevent the dismissal of the older and better salt.

The ground that the Pharmacopœia must follow the usage and requirements of physicians in general, even when the latter do fall into errors, may be the only safe general rule ; but unless there be a multitude of exceptions it is not a good rule for the highest and best interests of the art of medicine. It has always been the rule of the manufacturer and is well illustrated in the history of citrate of iron and quinia, but this history also illustrates that what is a good rule for the manufacturer may even satisfy a large majority of physicians, without being a good rule for their patients.

Beside all this, there is one point in the history of this preparation that is difficult to comprehend. The officinal salt is tasteless when given in a well-made uncoated pill, and is very nearly tasteless when in powder or suspended extemporaneously in any thick liquid as mucilage or syrup, and the constant demand of late has been for tasteless medicines, or at least those which are not nauseous. So prominent is this demand that physicians are often heard to complain that they lose their practice to homœopathy, etc., because their medicines are not made less disagreeable. Yet here in the case of this valuable agent, within twenty years a large majority of the whole profession has abandoned the tasteless form of it, and gone over to an inferior preparation, so as to give it in a solution which is very bitter, and which would be very justly objectionable to their patients if these knew they could take a better preparation in a nearly tasteless condition.

COPYRIGHT AND TRADE MARK ON MEDICINES.

In the discussion of this subject, which has been going on in the journals for some time past, the writer, E. R. Squibb, has occasionally seen it stated that he held copyrights or trade marks for medicinal preparations. It was supposed that this misstatement grew out of the fact that some five or six years ago the writer did patent certain apparatus for the manufacture of acetic acid for the arts, by the distillation of wood. It was not thought worth while to correct this misstatement or to expose its slight foundation. But the slander does not die out, and like others gains strength by repetition, for it now appears again in very definite form. In an advertising periodical of Messrs. Tilden & Co., called "The Journal of Materia Medica," edited by Drs. X. T. Bates and A. N. Allen, for July, 1882, page 215, this sentence occurs: "Thus Squibb copyrights his own name, and thereby guarantees the purity of any of his preparations." This statement is entirely untrue in every sense, for Squibb never did copyright, trade mark or patent any medicine or preparation of any kind, nor any bottle, label, wrapper or cover of any kind, nor any name or device of any kind. Neither did he ever claim any proprietorship in any process or medicine, nor had any secret or proprietary formula or process for anything. On the contrary, he has always been an uncompromising opponent of all proprietorship in medicinal articles, and never has, and probably never will cease from earnestly opposing all forms of copyright and trade mark and patent from the mildest form of the manufacturer of coated pills up to the aggravated abominations of the patent medicine market. Physicians may lend themselves to such things if they choose to do so, but as they do, and when they do they should cease to complain of their patients for doing so, and thus avoiding or ignoring the physician; and should cease to complain that they cannot command the respect and confidence of intelligent laymen.

ASSAYS OF CINCHONA.

Since the publication of the amended process for assaying Cinchona barks in the last EPHEMERIS, at page 105, the process has been critically applied to the following samples from the New York market with the results given:

	Total Alkaloids.	Ether Soluble Alkaloids.	Quinia.
Sample of Powdered Yellow Bark gave of....	2.66 p. c.	1.10 p. c.	0.94 p. c.
" " Red " "	4.00 "	2.20 "	2.02 "
" " " " "	6.75 "	3.89 "	3.61 "
" " Calisaya " "	2.68 "	2.3 "	2.3 "
" East India Succorubra "	5.8 "	2.81 "	1.99 "
" Ceylon officinalis " ...	6.4 "	3.78 "	3.24 "

The above assays show that very good Cinchona barks can be easily had in the New York market by those who choose to go to proper sources and pay adequate prices. The only poor sample met with was a low priced bark, the quality of which was in pretty accurate relation to the price.

Two or three more practical points have been observed in the farther application of the process, which are well worth stating.

The exhaustion of the bark by the management described is practically complete, as the residues from four different assays were farther exhausted with prolonged agitation and digestion, with the result of getting only about 3 milligrammes of alkaloids in each case, equal to 0.06 per cent.

In evaporating the amylic alcohol solution of the alkaloids on the water-bath if the capsule be filled above the edge of the ring in which it sits, the liquid will creep. But if the liquid be kept below the ring it will not creep.

Where water-wet and chloroform-wet filters are used to separate the solutions, the filter should not be filled too full, and should be closely watched to secure the proper time for the separation before the second liquid begins to pass through.

In evaporating the chloroform solution in the flask for obtaining the weight of the total alkaloids, both the water-bath and the drying stove should be kept below 85° C.=185° F., in order to avoid fusing any portion of the alkaloids; because when these fuse they adhere strongly to the flask, and are not easily disintegrated afterwards by the powdered glass, for the solvent action of the ether. As long as they remain attached to the flask the agitation may be continued until they are finally worn off by the attrition of the powdered glass, and thus their disintegration may be accomplished by prolonged and skillful agitation; but sometimes the lump will be detached from the flask in a mass, and then it escapes disintegration altogether, and the ether-soluble alkaloids contained in it are not washed out. But when no part of the alkaloids are allowed to fuse, all remaining on the sides and bottom of the flask in delicate crystals, radiating from numerous centres, the ether solution is easily completed with a moderate amount of vigorous agitation with the powdered glass.

When the 5 c.c. of ether is poured upon the total alkaloids in the flask and has been shaken around a few times, the flask should be grasped in one hand and the cork loosened carefully, so as to let the compressed vapor escape before the vigorous and prolonged agitation. If this be not done, the expansion of the mixture of air and ether vapor within the flask will be sufficient to burst perhaps one flask out of ten, by which the assay is of course lost.

The little experience with this process during the past few months is altogether favorable to it, and it now appears simple and easy and successful, not only in the writer's hands, but also in those of his assistants.

AN EPHEMERIS
OF
MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. NOVEMBER, 1882. No. 6.

IMPORTANT CHANGE IN THE STRENGTH OF OPIUM AND ITS PREPARATIONS.

The revision of the U. S. Pharmacopœia of 1880, now just issued, makes a great increase in the strength of the officinal opium ; and as it does not make a corresponding change in the proportions of the formulas for the preparations, these all become very much stronger, the principal liquid preparations being about one-half stronger.

In the instructions of the Convention to the Committee of Revision, see page xxii, the Convention directs that "in the liquid opium preparations, excepting paregoric, the strength of 10 per cent. shall be adopted, if found advisable." This has been found advisable and has been adopted, and had the strength of opium remained as before this change would have increased the strength of the preparations about 10 per cent., as stated in the "Table exhibiting differences of strength," found at page 454. But this statement, if regarded alone, is misleading, because this is not the entire difference in strength, nor the greatest difference. The real or entire difference is this one plus the difference in strength of the powdered opium used in the formulas ; while the difference in strength of powdered opium is very indefinite in both Pharmacopœias. It is only less indefinite in the new one because there it is possible to get an average strength, which average is about 40 per cent. above the minimum strength of the revision of 1870.

This change is a very much needed step in the right direction, and if it can be promptly made known and be generally recognized its advantages will soon be realized. There has always been much confusion and uncertainty in the strength of opium and its preparations, because the strength of the officinal opium was so indefinite, and for a time this confusion may be increased; but if the new Pharmacopœia be followed, the results must be important in the interest of more accurate medication by this very important drug.

The Pharmacopœia of 1870 says that its "opium when dried at 212° until it ceases to lose weight, should yield at least 10 per cent. of morphia by the officinal process." This "officinal process" is the Staples process, which, although by no means the best process of assay, does, under careful management, give account of nearly all the morphia. A powdered opium slightly above this 10 per cent. standard gives, by the 1870 formulas, to officinal Tincture, and Deodorized Tincture of Opium a strength of 4 grains of morphia, equivalent to 5.33 grains of crystallized sulphate of morphia in each fluidounce, and this has been considered to be the officinal strength of these preparations, and has been adopted in the practice of the writer for many years, the Compound Solution of Opium being made of this same strength.

The present Pharmacopœia of 1880, just issued, says its powdered opium "should contain not less than 12 nor more than 16 per cent. of morphine when assayed by the process given under opium."

This process of assay in the hands of this writer, and probably in the hands of most other pharmacists, does not give an account of all the morphia in opium by from 1 to 2 per cent. So that the true application of the Pharmacopœia definition in ordinary practice gives an opium which really contains 13 to 17 per cent. of morphia, the average being 15 per cent. But if its preparations be made by its new formulas, a 12 per cent. powder will give them 5.44 grains of morphia in each fluidounce, while, if a 16 per cent. powder be used, the preparations will contain 7.25 grains, a difference much too great for any accurate therapeutic application. Hence the adoption by the writer of a uniform and definite intermediate proportion of 6 grains in each fluidounce, equivalent to 7.5 grains of sulphate of morphia; and this is just one-half more than the old standard of 4 grains in each fluidounce. The new standard gives one grain of morphia in each 80 minims, or one grain of sulphate of morphia in each 64 minims, making 16 minims the equivalent of a quarter of a grain of the sulphate.

This uniform proportion will give very effective and accurate preparations well adapted to that precision of dosage that best guards against over-effects.

If heretofore the full anodyne dose of Tincture, Deodorized Tincture, or Compound Solution of Opium, has been 24 minims, or say 38 drops, representing a quarter of a grain of sulphate of morphia, the corresponding dose of the new preparations will be 16 minims, or say 25 drops.

This is a large and important change of dose, and, although not perhaps very dangerous under ordinary circumstances if unrecognized, yet it would add its hurtful effects to the common overdosing by opium and its preparations, and headaches, nausea, etc., would be more severe.

It is now, of course, more important than ever that the label of every package of opium and its preparations should give the morphia strength of its contents; and each pharmacist and physician should carefully examine the labels to know just which they are dispensing and prescribing, whether the 1870 or the 1880 preparations. In the use of powdered opium they have long been subjected to variations as great as these without knowing it, but the liquid preparations, which are far more largely used, were rarely over 4 grains to the fluidounce, and were generally below this. And it is possible, if not very probable, that in common practice they will continue to be of such strengths, despite the authority of the Pharmacopœia, and the labels will not have the strength stated on them.

There are, however, many pharmacists who, with the writer, will strive to uphold the present change of standard, and who, as their old stocks of the former strength give out, will replace them by the new with revised labels.

Of course, a pound bottle of the new preparations will be equal to a pound and a half of the old, and will cost as much, but there will be a saving in the cost of bottles, transportation and storage room, and the country practitioner will carry a better supply in his pocket case. But by far the greatest advantages will be the smaller dose and improved accuracy of the preparations, and therefore the improved medication under their use, whilst no serious accidents need occur if ordinary caution be taken.

In physicians' prescriptions where, for example, Deodorized Tincture of Opium is ordered, the figures "1870" or "1880" should be added, and he should give his dispensing pharmacist the liberty of using whichever preparation he might have in the proper proportion of $1\frac{1}{2}$ to 1 until the change becomes established. That is, if 24 minims of the 1870 should be ordered, the pharmacist should use instead 16 minims of the 1880 if he happens to have the new and not the old strength.

As the old preparations and the new are identical, excepting the morphia strength, it is only necessary to dilute two measures of the new preparations with one measure of menstruum to reduce them to the exact strength of the old preparations.

For diluting the Tincture of Opium, or the Deodorized Tincture of Opium, diluted alcohol should be used.

For diluting the Compound Solution of Opium alcohol should be used.

It will, of course, be some time before the new strengths get into anything like general use, but it is to be reasonably expected that the careful and thoughtful physicians and pharmacists will at once seek to avail themselves of them, and the sooner the better if with due care and knowledge.

This note is hastily written in order to publish it at the earliest opportunity, the whole object being to give prompt notice that all opium preparations made in strict accordance with the new Pharmacopœia of 1880, will be about one-half stronger than they were formerly, and that this writer will so make them.

Although by courtesy of the Committee of Revision, the proof sheets of the new revision passed through the writer's hands before the publication of the work, he failed to realize the extent of this change until he came to make the preparations in question by the new formulas which are now authoritative for strength.

It is, therefore, not improbable that others might overlook them, and hence the utility of a prominent and prompt notice, and it is hoped that the medical and pharmaceutical journals will at once give the subject a prominent place in their pages.

EPIDERMIC MEDICATION.

Epidermic medication as here considered is not medication of the skin for diseases of the skin, but medication by absorption through the healthy skin in contradistinction to medication by absorption through the mucous membranes of the primæ viæ, and in contradistinction to hypodermic medication. Epidermic medication is often alluded to or intended when the words "dermic medication" are used, but this is inaccurate, as the latter expression has been appropriated by the specialists in skin diseases. Such a distinction of terms leaves the word endermic to apply to medication after the cuticle has been removed. Mr. John Marshall, F. R. S., in the London *Lancet* for May 25, 1872, p. 709, seems to have been the first to show the facility with which an oleate of mercury passes through the sound skin, and the efficacy of the mercury when introduced in this way. He seems to have used the oleic acid simply as a convenient vehicle for the oxide of mercury, and morphia, without thinking, perhaps, that a very useful method of medication through the unbroken skin might and should grow out of his observations. Many persons took up the idea from Mr. Marshall's paper, and among them the present writer, but from that time to this nothing worthy of the name of accurate research or systematic observation has been undertaken. The field is an excellent one, and the object of this note is to try to stimulate some close and accurate observers to take up this subject of epidermic medication, with the hope that its advantages may be brought out and rendered generally available. For some uses, and these, perhaps, not very few, it has great advantages over hypodermic medication. The use of salves and ointments is as old as the earliest days of medicine, and the fats as salts of the fatty acids with glycerin have always been the common vehicles for this kind of medication. But with these merely as vehicles the absorption has been very slow and uncertain, and therefore the utility comparatively small. An oleate of glycerin, say common olive oil for example, when used as a solvent or vehicle for an active medicine, is absorbed or is passed through the skin very slowly and imperfectly ; but if the glycerin of the oleate be chemically replaced by a basic medicinal agent by the chemical reaction commonly spoken of as saponification, and if this soap be then dissolved in an excess of the fatty acid, the whole seems to pass more rapidly through the skin by an endosmosis, and the general as well as the local medicinal effect is correspondingly prompt and certain. There seems to be some relation of homology between these liquid fatty acids and the skin which causes the acids to pass in and be absorbed more rapidly and more easily than any other liquids, and to carry in with them anything with which they are chemically combined. Thus the original observations of Marshall showed that any degree of mercurial effect, either local or general, could be promptly and easily procured, with very accurate limitation, by the local application of very small quantities of oleate of mercury, and also that local pain could be controlled by oleate of morphia, and that the quantities of mercury and morphia required for a given effect were much smaller when locally applied than when given by the mouth. Since then the physiological effects of aconitia, atropia, quinia, strychnia and veratria have all been as easily and as promptly obtained, while the primæ viæ have been saved from disturbance fully as well as by hypodermic medication, if not better. It has simply been known more or less generally that the application of a little oleate of atropia, for example, without friction, under oiled silk, around an irritated and painful joint, would not only afford a prompt atropia relief, but the pupils would be as promptly dilated. Then, by direct and unavoidable inference, all similar tissue throughout the whole body everywhere would be similarly effected. But as to any careful or accurate investigation or observation into which quantity, time and quality of action have entered, there seems to have been none, either with this or any other of the oleates. Yet upon the loose and desultory experience handed along in a loose, disjointed way, oleate of mercury has gone into a very extensive use. Next, oleate of morphia has been pretty largely used, especially as an anodyne for infants and children, while comparatively few of the other oleates, although affording equally definite results, have been much used.

The need seems to be that those who meet with the indications for the use of the alkaloids and the metallic bases should apply them in this form with care, accuracy and close observation, and then publish their results. In this way, in a short time, a method of epidermic medication would either come into definite and established use or go out of use altogether. If any general method of epidermic medication could be established, its many very apparent advantages would soon render it of great general value. While, if there be practical objections to it, these would be brought out, and it would soon cease to complicate an already over-loaded materia medica.

The most that this writer can contribute upon oleic acid in its relation to epidermic medication is the curious circumstance that wood, porcelain or cloth greased with oils, glycerin or oleic acid seem to remain greasy alike for an indefinite length of time. But if the skin be similarly treated, the parts greased with oleic acid will be dry the soonest. All will disappear through the skin in time, but the oleic acid in the shortest time, and indeed in a remarkably short time. A few minims of the acid, or of any oleate, spread over any portion of the skin and simply covered with oiled silk or rubber tissue will entirely disappear in half an hour, and as it is irritant to the skin of few persons, this may be repeated as often as may be desired. It seems, from the circumstances, highly probable that mercury may be used in this way with the greatest possible accuracy and safety, for either its local or constitutional effects, or both together, since the quantity can be controlled with great accuracy by a minimum amount of care and skill, while it is least liable to accidental causes of undue activity.

This much then may be said of epidermic medication as it now stands: First, that it is entirely rational, and a legitimate result of inductive progress from the known to that which may become known; and second, that it is not a novelty nor a startling discovery, but has a record of experience which, though indefinite and loose, fully warrants the labor of the more extended and more accurate research that is so much needed by it.

THE MEDICINAL OLEATES.

Chevreul (Recherches Sur les Corps Gras) discovered oleic acid about 1811, and notices of medicinal oleates may be found in the chemistry and pharmacy of France about that time. The first paper met with in the English language, however, is by Professor Attfield. This is "On a Method of Dissolving Alkaloids in Oils," and is published in the British "Pharmaceutical Journal and Transactions" for 1862–3, Vol. IV., p. 388. This paper refers mainly, but not entirely, to the use of oleates for the purpose of rendering their bases soluble in oil, and both in the paper and in the discussion which followed the reading of it, this use of the oleates was discouraged as tending to useless polypharmacy. From this time nothing very definite has been met with until the publication of the paper of Mr. John Marshall in 1872. Since 1872 very general notice has been taken of the subject, in a casual, inexact way, by authors on therapeutics and materia medica, and several papers have appeared upon the chemistry and pharmacy of the oleates. Various methods of preparation have been advocated, but none so good as the direct union of the acid with the dry base without heating. The preparation should always be either a liquid or a semi-solid which is easily and completely liquified by the natural temperature of the surface to which it is to be applied, and hence normal oleates undiluted are not applicable to therapeutic uses, but only solutions of the oleates, and these solutions should always be in oleic acid as the solvent rather than in oils, because the acid is more readily absorbed than the oils. In the rare cases where the excess of acid as a solvent of the oleates proves irritant to the skin, dilution with a bland oil becomes admissible. A paper has appeared recently by Dr. John V. Shoemaker, see "The Medical Bulletin" for July, 1882, p. 153, in which it is stated that the oleates as commonly prepared and used are not chemically true oleates, but merely solutions of oxides in oleic acid, and as such will often give negative results. This is a mistake, and is as great an error as it would be to say that mercuric nitric, made by dissolving mercuric oxide in nitric acid, was not a chemical nitrate, but only a solution of the oxide in the acid. This author also states that the best method of making oleates for medicinal uses is by double decomposition; and this, as a general statement, is also a mistake, as very few oleates are well made in this way, and it is doubtful whether any are best made by double decomposition between solution of oleate of sodium and solution of salts of the bases. At least this is neither the simplest nor the easiest way of making the solutions of the oleates in oleic acid as required for the best and the easiest absorption through the sound or unbroken skin, and it is incorrect to write of preparations made by direct union of the acid and base as "supposed oleates," of "indefinite and unstable character."

The oleates which, up to this time, appear to have been most used, are oleates of aconitia, atropia, mercury, morphia, quinia, strychnia, veratria and zinc. These for general or epidermic use through the skin, while for special or dermic use in diseases of the skin, oleates of copper, lead and zinc are those most frequently heard of.

Oleates of the more active alkaloids, namely aconitia, atropia, strychnia and veratria are usually and properly made of the strength of two per cent. of the alkaloid. The oleate of morphia usually contains five per cent. of that alkaloid, while the oleate of quinia is made as strong as is practicable, and usually contains twenty per cent. of the alkaloid.

All of these are very simply and easily made by putting the weighed quantity of the alkaloid into a mortar, adding a small quantity of the oleic acid, little by little, and triturating until the alkaloid is completely dissolved. The strong solution thus made is then poured into a tared bottle, and the mortar and pestle rinsed twice into the bottle with small quantities of oleic acid. The proper weight is then made up by the addition of oleic acid. No heat is needed, nor should any be used in the preparation of many oleates, but in some of these the digestion is prolonged, and intervals of trituration are needed. All heating has a great tendency to change their molecular constitution. If well made oleate of morphia be shaken with dilute sulphuric acid, the morphia should be washed out as a sulphate, but it is a singular fact that it cannot all be so recovered as morphia; yet the morphia effect of the oleate is prompt and decided. This appears to show that some change is effected in the alkaloid even by combining it without heat, while if heated the changes are destructive.

The molecular or combining weight of oleic acid is high, namely, 282, but the weights of the alkaloids are still higher. That of aconitia is 645, atropia 239, morphia 285, quinia 324, strychnia 334, and veratria 592. Hence the molecule of the respective oleates would be very complex and very easily split up by any forces tending to decomposition, as heat, light, etc., or by oxidation from undue exposure to air. Hence it is that oleates may not keep well, but should be as freshly made as practicable, and should not be relied upon for their full effect when more than a year old, even if they have been carefully kept in a cool place.

The normal oleates—that is, when the oleic acid is fully saturated by the base—contain the following percentage of the respective bases:

Oleate of aconitia,	about	69.6	per cent.	of aconitia.
Oleate of atropia,	"	50.6	"	" atropia.
Oleate of morphia,	"	50.3	"	" morphia.
Oleate of quinia,	"	53.5	"	" quinia.
Oleate of strychnia,	"	54.2	"	" strychnia.
Oleate of veratria,	"	67.7	"	" veratria.
Oleate of bismuth,	"	22.2	"	" $Bi_2 O_3$.
Oleate of copper,	"	12.7	"	" Cu O.
Oleate of iron,	"	11.7	"	" Fe O.
Oleate of lead,	"	29.	"	" Pb O.
Oleate of mercury,	"	28.4	"	" Hg O.
Oleate of zinc,	"	12.9	"	" Zn O.

A brief notice of the therapeutic application of some of these oleates may not be without use. In epidermic medication it must be borne in mind that the skin, in common with the mucous membranes of the primæ viæ, does not absorb with equal facility or rapidity at all times. As was forcibly said by Prof. Chas. D.

Meigs in regard to the occasional inactivity of powdered ergot in parturient women: "There are conditions of stomach in which you might as well put your medicines in a bladder and hang it up on a nail." So there are conditions of skin wherein absorption is slow and difficult, and in all such, hypodermic medication has great advantages, and it is highly probable that the hypodermic use of these oleates would be effective in such cases.

In reviewing the principal oleates somewhat in detail, it may be useful to begin with oleic acid.

OLEIC ACID.

This is made from the so-called "red oil" of the makers of stearin candles. The other fatty acids are separated from the oleic by solidifying at higher temperatures, when they can be filtered out. But they are never completely separated, nor is it necessary they should be, since this oleic acid for medicinal uses does not aim at a high degree of chemical purity. The crude oleic acid is next washed with solution of sulphurous acid, and finally is repeatedly washed with water, and carefully filtered in the cold with the least practicable exposure to air.

It is then an oily liquid of the color of pale sherry wine, having a faint, peculiar, indescribable odor and taste, free from acridity. Its s.g. is .898 to .900, at 15.6° C.=60° F. It is thinner than the oils, and much more easily wiped off of surfaces without leaving them greasy. Applied to the skin, it wets it almost like water, and if very thinly applied it is so quickly absorbed that it seems as if it had evaporated like water; and it leaves the skin as clean and free from greasiness as though it had been wet with water. The peculiar odor of the acid is much stronger when it is spread upon the skin than when in the bottle. It should be kept from the light and air as much as practicable, although it does not appear to rancidify as easily as fats and oils do. As it has not yet been determined how the oleates keep, it is very good practice to keep the oleic acid on hand, and from it make the oleates as they are required for use—not necessarily each time they are prescribed, but every month or two.

OLEATE OF ACONITIA.

This is made by simply putting the dry alkaloid and the acid together, when the alkaloid, if pure, instantly dissolves and disappears. This is, however, only the case with the alkaloid precipitated from the "aconitine" of Duquesnel * (see page 167). With the other aconitias of the market the solution is not quite so prompt, and a little residue is often left undissolved, and has to be filtered out. The oleate should, however, always be made from the best aconitia, although it be thus rendered very expensive. The increased cost is, however, rather apparent than real, since half a drachm of such an oleate is more effective than an ounce made from ordinary aconitia.

There is no pharmacopœial authority for the strength of this oleate, but usage has started it at two per cent. That is, 2 grains of aconitia in 98 grains of oleic acid. Then, as the aconitia precipitated from "Duquesnel's aconitine" costs at least 40 cents a grain, the 100 grains of this oleate would cost say 82 cents. But the preparation is an exceedingly active and potent one, and is, therefore, required in very small quantity. Remembering that the dose of this aconitia for internal administration is from the one hundredth to the two hundredth of a grain, there will be at least three hundred doses in one hundred grains of the oleate. Hence it will be required, in any probable use of it, in very small quantity, and as it must be a very dangerous substance, it should never be put up or dispensed in larger quantity than about the sixteenth of a fluidounce, or two cubic centimetres, and this quantity would contain the eighth of a grain. Each minim weighs eight-tenths of a grain, and contains about one-sixtieth of a grain of aconitia. A drop from the thin lip of the vial in which it is dispensed is about half a minim.

This oleate should be applied by means of the end of the cork which stops the bottle containing it. If twice the quantity which the end of the cork will carry be spread over about half a square inch of the skin on the back of the hand, a glow of warmth in the part is almost instantly felt. This will continue for some minutes, then become intermittent, and in a half hour will have entirely disappeared. If twice this quantity be then applied to about a square inch of surface, including the first portion, the glow will be more pronounced, and there will be prompt tingling in the nerves which pass under the part down to the ends of the fingers. In a few minutes the glow will have increased to a sense of heat and pricking

* This "aconitine" is a nitrate of aconitia, and requires to be precipitated and dried. As sold under the name of "Duquesnel's aconitine" it is entirely insoluble in oleic acid.

in the part, and the tingling along the course of the nerves will have increased. In a quarter of an hour there will be slight numbness in the ends of the fingers to which these nerves are distributed. All these sensations will increase slightly and steadily for about half an hour, and will then subside, becoming intermittent with longer intervals, until they disappear at about the end of an hour, when the oleate will have nearly disappeared from the surface. If, however, at the end of half an hour the dose be repeated on the same surface, all the sensations are promptly increased and extended to the whole hand. In a quarter of an hour a slight glow of warmth is felt throughout the arm, with just perceptible intermittent tingling. This tingling was noticeable with widening intervals for at least ten hours, and on the following day there was itching of the surface.

This much may serve to show the potency of the preparation, and to indicate both the dose and the use. If in trigeminal neuralgia such an application of this oleate be made over the course of the branch involved, or over the point of emergence and distribution of the nerve, it will probably soon do all that aconite can do for the case in a better, safer and more manageable way than by internal administration. The active medication of the whole organism to get at a local nerve at a point of pain seems to be a roundabout way when access can be had directly to it by such means as this oleate, while at the end of a few hours of the above mentioned experiments it seemed quite plain that the aconite influence had extended to the entire organism, for the sensations were distinctly felt in the opposite hand, and although the temperature and pulse were not taken, they were evidently both reduced.

OLEATE OF ATROPIA.

This oleate is made in exactly the same way as the oleate of aconitia, and by general usage is of the same strength, namely, two per cent, Although an active and potent preparation, it is by no means so active or dangerous as the oleate of aconitia. It has been said that the application of five minims of this oleate to a knee-joint of an adult patient has produced dilatation of the pupils within a quarter of an hour just as a very good belladonna plaster should do, with prompt relief of pain, and if this be true it serves well to indicate the power and the dose of this oleate. There is, beside, considerable loose and scattered testimony to its steady though slow effect upon the pupil when applied in the neighborhood of the eye. It would seem that it ought to be very manageable and very useful in ophthalmology as a substitute or alternate for instillation of the watery solution, but up to this time it has not attracted much attention so far as any published statements go. Yet there is a good deal of it sold, and judging by the sales its use is increasing, probably mainly as an application to painful joints as a substitute for belladonna plasters.

Each minim contains about one-sixtieth of a grain of atropia, and a drop from a common one-ounce vial is about two-thirds of a minim, or from an homœopathic vial with thin lips about half a minim, or one one-hundred and twentieth grain.

OLEATE OF MORPHIA.

This is made precisely as the preceding oleates, except that as the morphia of the markets is in crystals, their solution in oleic acid is slow, unless the crystals be rubbed into powder before adding them to the acid in the bottle in which the solution is to be made. A little agitation is then all that is needed. This is the only one of the oleates of the alkaloids that within a short time changes much in keeping. When the elements of it are first put together the solution begins to grow darker, and this change progresses until within a year it becomes very dark indeed. This change in keeping does not destroy its efficacy, but whether it diminishes it or not has not been shown. This oleate was introduced by Mr. John Marshall, who made it of the strength of five per cent. or 5 grains of morphia to 95 grains of oleic acid, and this strength has now been generally adopted. This oleate is quite largely used, and yet very little accurate information or observation in regard to it has been published in the ten years that have passed since its introduction. Several good observers within the writer's personal knowledge have occasionally used it for some years past in special cases, and with alleged success, especially as an anodyne and sedative in infants and children. Five to ten minims applied to the abdomen under oiled silk seems to be about the usual dose for children of one to four years.

As a simple sedative hypnotic it is often applied to the inside of the thighs and arms of infants, one or two drops spread over a large area in each locality so as to get not more than four or five drops in all for infants of six months. It should be dropped onto the surface with care, and be spread by the ball of one finger, and as sometimes the absorption is slow the dose should not be repeated within an hour if the first one be insufficient. It is said to have less tendency to constipate than any other opiate. Each ordinary drop contains nearly one-twentieth of a grain of morphia. It is probable that this oleate should be double in strength.

OLEATE OF QUINIA.

This, although it has not attracted general attention, is probably one of the most important of the oleates. From the larger quantity of the quinia needed in medicine this oleate is made as strong as possible. While a normal oleate of this alkaloid would by calculation contain about 53 per cent. of the alkaloid, it has been found impracticable to dissolve that quantity in the acid. In a series of experiments made some years ago when this oleate was introduced, it was concluded that 25 per cent. was the best proportion. But as the quinia of the market holds some hygrometric moisture, it is better to take 26 grains of the alkaloid and 74 grains of oleic acid as the formula. The alkaloid is simply rubbed to powder, and added to the acid in a bottle. Like the other alkaloids this dissolves so readily that being in much larger proportion, it is liable to clog together and be slow in dissolving. But this clogging together is easily broken up by means of a glass rod. Or the solution may be effected in a capsule and the clogging be prevented by a pestle. In this way it is easily made in a very few minutes. A fluidounce of this oleate weighs about 410 grains, and, therefore, contains about 102 grains of quinia, which is equivalent to about 140 grains of the ordinary sulphate of quinia. Therefore, a fluidrachm contains the equivalent of about 17 grains of the sulphate, and a minim is equivalent to a little more than a quarter of a grain. An hypodermic injection of a fluidrachm will, therefore, carry the equivalent of 17 to 18 grains of sulphate of quinia.

It happens, perhaps oftener with the administration of quinia than most other medicines, that the physician wants to save the stomach. And many conditions need quinia when the stomach will not accept it, or will not utilize it if given by the mouth. These circumstances have long indicated the hypodermic use of quinia, but up to this time no solution has been proposed that is well adapted to hypodermic use, first, because of the large dose required, and again, because of sparing solubility of available quinia salts. Hence this oleate has been sometimes used hypodermically, but with what success is unknown to the writer. The epidermic use, however, is of late not uncommon, and since it was first proposed occasional trustworthy testimony from private sources has led the writer to consider it an important adjunct to the more common methods of using quinia. The quantity of oleate needed here is considerable, often amounting to one or two fluidrachms. Hence it should always be applied under oiled silk or gutta percha tissue. When put directly on the skin a minim will require about four square inches of surface or it will run, and a fluidrachm would require about two square feet of surface. an area hardly accessible under ordinary circumstances. But two pieces of very thin fine old muslin or linen, six by nine inches, will easily hold half a fluidrachm each, and may be applied to the insides of the thighs, covered by oiled silk. This leaves the abdomen available for another similar application if desirable, and the oleate can be renewed on these places as rapidly as it is absorbed. Another good way of applying it, especially in walking cases, to get a moderate continuous effect, is to anoint the spinal tract for an inch or more on each side of the spinous processes morning and evening with a half fluidrachm, and cover it with a strip of oiled silk under the clothing. The writer has heard of several instances in which ringing in the ears was speedily produced by such applications of the oleate.

OLEATE OF STRYCHNIA.

This is made exactly in the same way as the oleate of quinia, the crystals of the alkaloid being simply rubbed to powder and added to the acid in the bottle, the solution being promptly and easily effected.

In strength this oleate has been generally made two per cent., that is, 2 grains of strychina to 98 grains of oleic acid ; but of course it may be as easily made of any desired strength, short of the saturation of the acid.

When of two per cent., each minim will represent about one-sixtieth of a grain of strychnia, and a drop wlil represent from one–half to two-thirds of this quantity, according to the thickness of the vial lip from which the drop falls.

This should be a very effective way of using strychnia, but it has not yet come into use to any extent. For application to the temples in the treatment of some eye disease, it would seem to be better adapted than the present mode by hypodermic injections, because the effect would be more prolonged and more permanent. That is, the strychnia would remain in the neighborhood of the nerves to be affected by it for a longer time, and the application could be more easily made.

The general effects of strychnia would doubtless be as easily obtained by this oleate as in the instances of the other alkaloids.

OLEATE OF VERATRIA.

Made in exactly the same way as oleate of strychnia and of the same strength, namely : two per cent., the minim representing the one-sixtieth of a grain.

This oleate has been more used than many of the others, and generally as a local application in the various forms of neuralgia. It is much weaker than aconitia, and as it is applied to similar uses much more of it is required. It should, therefore, be made much stronger or as strong as the skin would bear it. Probably ten per cent. would be much better than two, and would make the preparation more serviceable, as then a sufficient dose could be applied without involving too great a surface. If of the strength of ten per cent. the effective dose would be much more manageable, and more nearly parallel with the oleates of aconitia and atropia ; and it would then have more chance of sustaining its reputation for controlling some cases of neuralgia which resist the action of aconitia.

These oleates of the alkaloids are all fluids and should be, as their application demands an accuracy of dose easily attained by minims or drops, but not so easily attained if they were semi-solids; but the oleates with metallic bases do not need such accuracy of dose, and are best dispensed and applied as soft ointments.

OLEATE OF COPPER.

This should be made to contain at least five per cent. of oxide of copper, but it may be made of normal strength, that is, containing 12.7 per cent. of oxide. The five per cent. oleate is liquid when first made, but soon acquires a kind of semi-gelatinous consistence. It is very easily made by simply adding the oxide and acid together in a bottle. In the cold the solution of the oxide is slow, requiring two or three weeks and frequent agitation. When warmed, however, a few hours only is necessary. The resulting oleate is of a beautiful dark-green color, and appears to keep well.

It has been used solely in dermic medication, that is, in treating skin diseases, so far as is known to the writer, and its value is not known.

OLEATE OF LEAD.

This oleate, in order to be of a proper consistence, should contain twenty per cent. of oxide of lead. The oxide dissolves slowly in the cold, but more easily and rapidly when warmed to about 66°C. = 150°F.

It forms a yellowish unguent, and is used only in skin diseases so far as is known to the writer, and very little testimony in regard to its uses or value has been met with.

OLEATE OF MERCURY.

This is the oldest and, perhaps, the most important of the oleates, perhaps because it has been most used, and therefore its effects and uses are best known. As introduced by Mr. Marshall it contained six per cent. of oxide of mercury, and this strength is still the one most frequently used, but a strength of ten per cent. has also been largely used, and more recently one of twenty per cent., which latter should and probably will soon supersede the others. Either strength is easily made by simply putting together the yellow oxide of mercury and the acid in the cold, and waiting until the solution takes place, stirring occasionally. All heating should be avoided in making this oleate, even the heat of the combining elements being probably hurtful. Time and patience easily effects the combination, but even with the greatest care the weaker or more liquid preparations do not keep well. In a few weeks a film of metallic mercury shows itself at the bottom of each vial, and in a few months this film will represent about one per cent. of the mercury used. From this circumstance it has been the practice of the writer to always put up both the six per cent. and the ten per cent., with one per cent. excess of the oxide to compensate for this decomposition, so that the practitioner will really get the strength called for by the label if the preparation be not very old, and be well protected against heat and light. These strengths can, however, never be very accurate, because the decomposition though slow begins early, and probably continues indefinitely or until all the mercury is reduced. When made of the strength of twenty per cent., however, this decomposition does not occur, or at least does not occur to any practically hurtful extent. Of a sample that had been made three years nineteen per cent. was soluble in ether, thus showing that it keeps well, while the others do not. It is a very soft solid, like very soft butter, but yet solid enough to prevent all circulation among its particles, and it is probably to this condition that its superior keeping properties are due. Because it keeps so well and the other strengths do not, it is the only oleate of mercury that should be used. Its greater strength is no valid objection to its application, as it is only necessary to apply so much less of it. Or if not easily enough controlled in that way, it can be diluted at the time of using to any definite strength with olive oil, or preferably with oleic acid.

No reduced mercury has ever been noticed in any well-made oleate of this strength.

The uses and applications of oleate of mercury are now too well and too generally known to need repetition here. Suffice it to say that by its epidermic use the most prompt, the best, and the most easily controlled mercurial impression can be obtained, whereby a remedy often dangerous has been rendered, under proper skill and care, comparatively harmless or altogether beneficent in a very large number of cases which cannot be very successfully treated without mercurials.

OLEATE OF MERCURY AND MORPHIA.

This double oleate was also introduced by Mr. Marshall, and, therefore, is among those which are oldest and best known. The formula generally adopted and most used has been ten per cent. of the oxide and two per cent. of morphia. The morphia was at first used to correct or control the irritation of the skin from the application, but it was found to give a decided anodyne effect in painful joints, etc., while the tendency to irritate has been largely corrected by the use of a better oleic acid. The preparation, however, does not keep well. A specimen made in 1878 is now almost black in color, with a very considerable film of reduced mercury on the bottom of the vial. It is highly probable, however, that a twenty per cent. oleate of mercury would dissolve five per cent. of morphia and make a better preparation which would keep much better. Small quantities of such a preparation could be much better applied than the larger quantities of the weaker one.

OLEATE OF ZINC.

A twenty per cent. oleate of zinc is not unfrequently spoken of and asked for of late, and a preparation is sold as such. But as a normal oleate of zinc only contains the equivalent of about thirteen per cent. of the oxide, such a preparation can only be a mixture of oleate and oxide. It is generally in the condition of a dry, soapy, granular powder, and not susceptible of easy application for absorption even in skin diseases, but only applicable as a surface powder. For appropriate therapeutic use as a zinc preparation it should not be stronger than five per cent. When of this strength it is a soft solid of proper consistence for easy application in diseases of the skin. Of this strength it is well adapted to become a very useful preparation, but as yet its uses have not been very definitely stated.

Several other oleates have been mentioned as available for medicinal uses, and possibly some of them may be found useful, but as yet there is no accumulation of testimony in regard to them. Those occasionally heard of are oleates of aluminium, arsenic, bismuth, iron, nickel and silver, but the latter is an impracticable, if not an impossible, oleate.

DUQUESNEL'S "ACONITINE."

In a note on the "Preparations of Aconite" in the last EPHEMERIS it was shown that, although the four aconitias in use in this market were all very much weaker than they should be when compared with the strength of good aconite root, yet the "Aconitine Cristallisée" of H. Duquesnel, of Paris, was much the strongest of the four, and was, in all probability, the true aconitia from the aconitum napellus.

Since that note was written an attempt was made to combine this aconitine of Duquesnel with oleic acid, but it was found to be entirely insoluble in the acid. This led at once to the suspicion that it was not crystallized aconitia, as the label indicated, but was a salt of aconitia, and if a salt its solubility in water, as previously observed, would be explained. Duquesnel, as quoted in the Year-Book of Pharmacy for 1872, p. 238, describes crystalline aconitine and several of its salts, and the crystals of the alkaloid and of its nitrate are described as being similar in form. The crystallized alkaloid is said to be almost insoluble in water, while the salts are soluble. The crystallized alkaloid and the salts are described as though they were anhydrous, although this is not quite clear in regard to the salts. The precipitated alkaloid is described as being amorphous, and containing water of hydration, which it loses at 100° C. without change in appearance. Groves' Year-Book of Pharmacy for 1873, p. 507, states that the nitrate is anhydrous.

These crystals sold by Duquesnel as crystallized aconitine were then more carefully examined. They were found to be soluble to the extent of about 7 parts in 100 parts of distilled water at ordinary temperatures, giving a neutral solution.

Twelve bottles of "25 centigrammes" each were opened and yielded 3.165 grammes of crystals, or more than 5 per cent. over weight. The crystals were dissolved in about 60 c.c. of water, and the solution was precipitated with a slight excess of normal solution of sodium, and the precipitate was carefully washed and dried at about 44° C.=111° F. It then weighed 2.554 grammes. Portions of the mother-liquor were examined by the physiological test, and were found to give no aconite impression. The mother-liquor was then examined for the acid present, and it was found to be nitric acid. The normal solution of sodium used indicated 8.25 per cent. of nitric acid, but as it was used in slight excess the percentage was probably not above 8 per cent. Calculated upon the generally accepted composition of aconitia, the percentage should be 8.9.

Thus there was obtained from these crystals 80.7 per cent. of hydrated alkaloid, and about 8 per cent. of nitric acid, making a total of about 88.7 per cent. The remaining 11.3 per cent. was not accounted for, nor the water of hydration remaining in the alkaloid dried at so low a temperature. Duquesnel's "aconitine crystallisée" is, therefore, not what it purports to be, but is a nitrate of aconitia containing not more than 80.7 per cent. of the hydrated alkaloid.

BISMUTH BREATH.

(CORRECTION.)

In the last number of the EPHEMERIS, near the bottom of page 138, occurs the statement that "there is no known record of tellurium when given yielding this (garlicky) odor of breath." This should have been "no record known to the writer." Thanks to Professor J. W. Mallet, of the University of Virginia, the writer is now enabled to correct this statement, and to give, from Liebig's Annalen, Vol. LXXXVI., page 208 (1853), notice of a very full and interesting record of such garlicky odor from tellurium. From a translation made by Miss M. O. Glover, one of the writer's assistants, it appears that Hansen made experiments upon dogs, and upon himself and friend, Röder, with a tellurite of potassium. This salt in doses of 3 to 8 centigrammes an hour before each meal gave the garlicky breath within a few minutes after the first dose, and this odor soon became so strong that he had to seclude himself from society. He continued the doses during seven days; Röder continued the doses for two days with similar effect, and noticed the odor in his breath for eight days after. It is also stated that Prof. Wöhler, when investigating the volatile telluride of ethyl, noticed this same odor in his breath, and one night, when perspiring freely, the odor of the perspiration was almost unbearable. In the experiments on dogs the garlicky breath was perceptible after one minute. Hansen quotes Gmelin as having in 1824 given tellurous acid to a dog and a rabbit. The rabbit only was killed, and on dissection gave off a garlicky smell. Hansen attributes the odor to the formation of a volatile organic compound of tellurium like the telluride of ethyl, which is given off by the lungs and skin.

A. Wynter Blyth, in his "Manual of Chemistry," London, 1879, page 428, says: "Sir J. Simpson records a case in which a divinity student inadvertently swallowed a dose of tellurium, which was followed by the evolution of such persistent odor that for the remainder of the session the patient had to sit apart from his fellow students."

Thus it is shown very definitely that tellurium salts do give this garlicky breath, and so far as these experiments go they invariably produce it, and produce it quickly and to a very marked degree. But tellurium was sought for in vain in bismuth salts, which gave the garlicky breath in some cases, but did not give it in others, and hence these experiments of Hansen do not help much in finding the cause of the bismuth breath, unless tellurium was present in the bismuth but escaped detection, and unless when in such small quantity as to escape detection it does not invariably give the odor as in the larger quantities of Hansen's experiments. Possibly the question of tellurium in bismuth salts needs a more accurate and careful re-examination.

THE REMOVAL OF FIXED GLASS STOPPERS.

When the glass stopper of a bottle is ground fine enough to prevent leakage and is well put into its seat, it is generally somewhat difficult to get out. Often it is impossible to remove it by the ordinary means of tapping it and unscrewing with the fingers, and then most persons sacrifice the bottle by breaking off the neck. A glass-stoppered bottle that is so well ground as not to require the slovenly use of grease, or other aids to bad work, involves a good deal of skilled labor, and it is a real waste to destroy it, even if this can be done without any loss of the contents in breaking it. It is a fact not generally known that the very finest and most skillful stoppering that is practicable on a large scale and at moderate cost is not entirely effective against loss of many volatile liquids. A tray of fifty one-pound bottles of ether, kept in a cool cellar and carefully weighed from time to time, lost at the rate of more than an ounce a month throughout the whole experiment, although stoppered as well as practicable and never agitated. When agitated, as by transportation, and especially when transported in warm weather, the loss must be many times greater, and accidental imperfection in stoppering, or in the exposure of a box of bottles to a summer sun in long transportations, will occasionally cause the loss of a considerable part, or even the entire contents of some bottles, so that they reach their destination partly or entirely empty, but with little or no sign of leakage perceptible, so that the bottles look as though they had been put up partly full or empty. And leaks so small as not to be discoverable when put up are quite sufficient to empty a bottle during transportation. These difficulties are greatest with such liquids as chloroform, ether and nitrite of amyl, and the latter is the most difficult of all. All these stoppers require to be put in as tightly as it is possible to put them in, and all stoppers are screwed in with what is called a stopper wrench, and such a wrench is needed to take them out. This is a piece of hard wood about 3½ inches long by about an inch or an inch and a quarter in breadth and depth. In the middle of one side a mortise is cut nearly through just long enough and wide enough to admit the flat part of the largest size stopper. This applied to the stopper gives a very considerable leverage, and with it stoppers are screwed in by turning them in the direction of the movement of the hands of a watch, as all right-hand screws are put in. To take the stopper out it must, of course, be unscrewed or turned in the opposite direction. In this way almost all stoppers may be taken out safely if the neck of the stopper be strong enough to bear the strain, especially if the stopper be smartly tapped, first on one side and then on the other, by the wooden wrench before it is applied to unscrew it. But some liquids have a tendency to cement the stoppers into their seats either by drying in the joint or by a slight action upon the glass surfaces. Such liquids as solutions of soda and potassa, and especially the disinfectant solution of chlorinated soda, almost always render the stoppers immovable by any ordinary means, and even the stopper wrench will often fail to start them. It is highly probable that half the bottles used with such liquids are sacrificed before the contents can be got at, and in breaking off the necks the break often extends so that a part of the contents is liable to be lost.

When a stopper resists all management—by warming the neck with a cloth wet with hot water, by tapping, and by the wrench, or by all these in combination—there is another means which will almost always succeed. Let the bottle be inverted so as to stand on the stopper in a vessel of water, so filled that the water reaches up to the shoulder of the bottle, but not up to the label. The vessel should be so large that the bottle stands in an inclined position, or otherwise a portion of air may be trapped in the gutter between the mouth of the bottle and stopper, and thus prevent the access of the water to the joint which is to be soaked out. The bottle should stand in this position over night, and if still refractory, for another day and night, and if still tight, three or more days, and in such cases the water should be warm at first and again quite hot for the last five minutes before the wrench is applied. There are many bottles which are very valuable, and the better the stoppering the more valuable they are. Almost all such may be saved by the means indicated, if the necessary time and patience be given.

Many bottles which are hardest to unstopper by reason of the action of the liquids on the glass are unfit for any after use, and might about as well be sacrificed as not, were it not for the liability of losing the contents in breaking them.

TREATMENT FOR TAPEWORM.

The writer has for many years past received occasional letters of inquiry as to what is the best drug for the expulsion of tapeworm, and the inquiry is generally accompanied by the statement that a case is under treatment which had resisted all the ordinary parasiticides, such as a pumpkin seed, male fern, kooso, bark of pomegranate root, turpentine, etc. As any one of these drugs is sufficient, under any ordinary good management, to expel the parasite, and as the inquirers had generally succeeded in most of their cases with some one or other of these medicines, it has generally been concluded that it was not a question of the choice of a drug in the obstinate cases, but rather one of the location of the attachment of the head of the worm in the intestinal canal.

When the writer served as demonstrator of anatomy many years ago, he observed that there was great variation in the location of the head. Sometimes it would be found attached up near the duodenum, and at other times down near the ilio-cæcal valve, and that the attachment was not unfrequently in a little pouch, or under a fold of mucous membrane ; and that the head was always imbedded in a nidus of firm jelly-like substance, like inspissated mucus. This led to the conclusion that such cases would be very differently affected by treatment, and that a method quite efficient for some cases would be likely to fail in others from the difference of location, and further, that the obstinate cases were those where the attachment was so low down in the canal and so protected that it was difficult to get the parasiticide in contact with the head so as to poison it, and cause it to let go its hold. A few years later when in the eastern part of the Mediterranean, where uncooked sausages are largely eaten, the writer and others became affected with tapeworm, and he had good opportunities for observation, and was confirmed in the belief that the location of the head had much to do with the resistance of all obstinate cases, and that when the treatment was carefully directed by this consideration it was almost always successful, and that one parasiticide was about as good as another when well managed. Further experience at that time seemed to show that pumpkin seed and oleoresin of male fern were the best agents to use, and that there was but little choice between them. A plan of treatment was adopted which has been since given to so many physicians and patients with such general success that it may be worth while to publish it.

After a light dinner, near the middle of the day, the patient should take no food, but may drink freely of water. At bed-time a saline aperient should be taken in effective dose, and there is nothing better than one or two Seidlitz powders. This aperient should be a saline, because these cause a copious effusion of serous liquid from the whole mucous membrane of the canal, and this effusion taking place from the surface where the head of the worm lies protected by the dense mucus, detaches the mucus and washes it away, leaving the head bare for contact with the parasiticide, when otherwise it would pass over it without direct contact, and, therefore, without effect.

Whether this aperient at bed-time operates or not, it should be repeated on the following morning, the patient still abstaining from food. After the second saline has operated freely, or say at about ten o'clock, the medicine should be given.

Four ounces of pumpkin seeds are well beaten in a mortar, half an ounce at a time, a few drops of water being added from time to time until they are made into a paste. The shells need not be rejected, as they are rather useful than hurtful. Water is then gradually added to the paste with trituration, until a tolerably uniform emulsion is made measuring about a pint. This may be flavored if desired and iced, and is to be given in three doses at intervals of about two hours, beginning at about ten o'clock. During this time the patient should lie quietly in bed and avoid all causes of nausea or vomiting, and should correct these if they occur by a little ice taken into the mouth and stomach. The stomach in need of food will often digest the first dose, but a tendency to nausea will prevent the digestion of the others, and the third is often difficult to take without vomiting. By careful management and quiet the inverted peristaltic action may be generally avoided. But when it occurs early and is persistent the treatment is likely to fail, because the inverted action of the bowel prevents the emulsion from getting far enough down to come in contact with the head of the worm. Commonly, however, the peristaltic action will not be reversed, and about the time of the third dose or a little later there will be an alvine evacuation. But if not within an hour after the last dose, a half fluidounce of castor oil should be given in a little ale or porter. The evacuations should be received in a vessel partly filled with water so that the worm can be easily examined from end to end of each portion without breaking, and when the part is reached where the links grow smaller great care should be taken to find the head, for unless this be found the success of the treatment is by no means assured. And if the head be not found, detached links may be expected in the stools within three or four months, and the treatment will need to be repeated with larger preliminary fasting and greater care.

In a second trial, or when persistent vomiting has interfered with the first to invalidate it, the oleoresin of male fern may be substituted for the pumpkin seed. This is more easily taken than the large doses of emulsion, and is not so easily digested by the stomach, nor so liable to produce nausea, and from being an oleoresin, and therefore less soluble in the liquids it meets with, it is more likely to reach the head of the worm in a condition sufficiently concentrated to be a poison to the head, but it is probably a less active poison to the head than the pumpkin seed, and therefore less sure.

The oleoresin may be given in emulsion made with sugar and gum arabic, or with glycogen, but is perhaps better given in capsules, containing about ten grains each. Two of these should be taken every quarter of an hour until twelve capsules have been taken, unless nausea occurs of sufficient severity to endanger their rejection. Under such circumstances eight or ten capsules may be used as being all that can be safely given.

The oleoresin has often, especially in cold weather and when of good quality, a thick granular sediment. This should be carefully stirred in before weighing, as it is a very important part of the drug.

Of course the same careful preparation of the patient is needed with this as with the pumpkin seed, and neither of them should be expected to succeed in obstinate cases without the careful preliminary treatment.

ASSAYS OF CINCHONA.

Since the last EPHEMERIS the following cinchonas have been assayed by the process published at page 105, with the following results:

	Total alkaloids.	Ether soluble alkaloids.	Quinia.
Sample of lot of 4 cases E. I. succirubra	3.74 p. c.	2.12 p. c.	1.52 p. c.
" 15 " " "	4.62 "	3.04 "	2 40 "
" 1 bale " officinalis......	7.44 "	4.02 "	3.02 "
" 5 cases " "calisaya"...	7.04 "	3.52 "	2.74 "
" 1 ceroon Peruvian calisaya	5.42 "	4.22 "	4.22 "
" 6 cases E. I. succirubra....	8.16 "	3.95 "	2.94 "

The first two lots were invoiced simply as East India barks, but they are called succirubra because of the color and the results of the assay.

The third lot, a single bale of about 200 pounds, was also invoiced in the same way. But from the color of the powder and the assay it is evidently from the cinchona officinalis, or from a hybrid.

The fifth lot of one ceroon of Peruvian calisaya looked much like an East Indian, or at least like a cultivated bark, and not at all like the old-fashioned calisaya of western South America. The bark was thin and quilled, and would be readily mistaken for a handsome valuable Java or Darjeeling bark. The assay, however, shows that, like the calisaya, it contains a large proportion of quinia, and but little else.

ASSAYS OF OPIUM.

Two cases of Salonica opium have been recently assayed by the process given at page 14. Both were unusually large cases, and the opium very soft and uniform in appearance.

One case sampled in the moist condition, and the sample assayed, gave 14.08 per cent. of morphia. A part of the sample on being dried lost 23.28 per cent. of water.

The case was then dried and powdered, and the powder gave 18.03 per cent of morphia. This powder dried at 100° C. until it reached a constant weight, lost 4.55 per cent of moisture. But this moisture would be soon recovered by ordinary exposure to air.

The assay in the moist condition agrees very well with that of the powder, as will be seen by the formula: 100—23.28 moisture=76.72 when dry; as 76.72 : 14.08 : : 100 : 18.35, a difference of only 32 per cent., which is far within the limit of error in the assay process.

The second case was made into a depurated solution, and this, upon assay, gave 13.74 per cent. for the opium in its moist condition, or 17.92 per cent. if it had been dried or powdered as the other was.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. JANUARY, 1883. No. 7.

THE CODES OF MEDICAL ETHICS.

The time has now arrived when the medical profession of the State of New York has, in its central organization, to decide an important question of general medical ethics. The first issue to be brought is between the codes of ethics of the State Medical Society and the American Medical Association as they have stood for many years, on the one hand, and a revised code adopted by the State Society a year ago, without having been first submitted to the general consideration of the medical public for whom it legislates,—on the other. Now, however, this revised code has been before the medical public for a year, and has been so freely discussed and considered that a more mature and wise decision may be expected. But the public discussion of the subject seems to indicate that the real issue now is to be,—not between the old codes and the new,—but upon the abrogation of all codes and the releasing of all subjects treated of by the codes, to individual action. That is, the profession hitherto has been under a system of general laws, and rules for their application, these being among the objects and the results of their organization in societies for the general professional good; but now these laws and regulations are to be abolished, and each individual is to be a law unto himself, and to be free from either legal or moral responsibility to the organizations of which he forms a part He is to expect any benefits which may accrue from organizations, but is to be freed from all restraints. In striving for individual freedom of action he tacitly claims individual perfection, or exemption from error, and, therefore, not needing the restraints which the organizations of society are formed to impose.

He retrogrades from law,—that is, from the rules of civil conduct imposed by the many for the general or aggregate good of all, as the result of civilization,—to the lawlessness of individuality.

As each member of the profession of this State approaches this question with his vote and influence he should carefully read the two older codes of ethics, and read them from the point of view of finding the objections to them. They are long and verbose, but these qualities have served to render their meaning clear, and to display the broad moral principles upon which every point is made. The laws embodied in them are the simple application of common honesty, and high moral principles to professional conduct, and so rationally and so logically are these applied that few can rise from the reading of them without benefit to his moral nature. There is not one sentiment in them, from beginning to end, that is not as broad, as wise and as good as the golden rule upon which every sentiment is based. How, then, can they be hurtful, and why abrogate them? If, embodying the highest moral principles of human nature, they be a dead letter, because they are disregarded, this surely is no valid argument against them, nor in favor of their abrogation, but is only so much the worse for those to whom they are a dead letter.

If they do embody the highest moral principles of human nature, then the profession cannot have reached a plane so far above them as to render them either oppressive or discreditable; and if neither oppressive nor discreditable, what harm can they do? No harm can ever come from the expression of sentiments in rules of conduct, which in themselves are honest, true and wise, and therefore why abrogate them; and especially why in any just view of a higher morality or a greater individual liberty?

If abrogated in the interests of individual liberty, it is certainly pertinent to ask, "Liberty for what?" The highest moral rectitude of conduct is in the codes, and that alone is prescribed by them. Individual liberty outside of or independent of that moral rectitude of conduct is just what the codes are formed to restrain and discourage in the profession. Publicly abrogate the codes and the world is by that act at once informed that the medical profession, in its organized capacity to take general action for itself, is no longer bound, as before, by any general moral laws or obligations, but that each individual composing the profession is now a law unto himself, and he is at full liberty to govern his conduct by his own convictions and the common laws of trade.

Hence the logical conclusion from the abrogation of these codes will be that the medical profession now, by its own deliberate act, lowers itself from the rank of a profession to that of a trade, freed from any higher moral restraints than those of individual conviction, struggle and competition.

To have had a moral standard for professional conduct and to repeal it, is far worse than never to have had one, since it directly implies that the ground taken has been abandoned for the anarchy of individual action, or for a professional communism.

Throughout this whole dicussion not one word has been spoken or written against the high degree of professional honesty and moral principle upon which the old codes are formed, simply because there is not an objectionable sentiment to be found in them, and the humanity and justice which pervade them have been invoked to support the one single revolutionary change which constitutes the new code. The worst that has been said of the old codes is that they are effete and unnecessary, and that they are illiberal on the single point of heterogeneous consultations.

That detailed standards for professional conduct based upon a high degree of moral honesty and humanity can never be effete or unnecessary, or be behind the progress of this or any other age, seems impossible, and hence the enthusiasm and earnest warmth of the very able advocates of abrogation of the codes is most difficult to understand. This difficulty is probably the basis of the unjust charges which have been made against their motives for their movement against the codes.

During the past six months a few communications have appeared which, in view of the approaching meeting of the State Society, it may be useful to notice somewhat in detail.

In *The Medical Record* for August 5, 1882, page 166, a correspondent asks: "If a county medical society repudiates the action of the State Society in the matter of the new code, in what way will such action affect the relations of the County Society to the State Society."

In the editorial reply to this inquiry the following sentence occurs: "They must, however, formally adopt the new code as one of their by-laws if they desire to retain their legal status and corporate rights as a County Society, and their right to be represented in the State Society."

This sentence is so liable to be erroneously construed that it may be said to be in error. The natural construction is that the State

Society could refuse to receive delegates from all county societies which had not formally adopted the new code, just as The American Medical Association refused to receive the delegates from the State Society because the latter had substituted its new code for that of the American Medical Association. Such a construction will be seen to be entirely erroneous by a reference to the laws of the State as found in the By-Laws of the State Society, at page 16, under the heading "V. Relating to County Medical Societies."

Section 2 is as follows:

"If any county medical society shall neglect to perform all such acts as may be required to be done by it by the law incorporating medical societies, or any other law of the State relative to the science of medicine, or shall do acts which may be considered derogatory to the honor of the medical profession, or shall oppose or neglect to comply with the by-laws of this Society, it shall be admonished touching any such proceedings; and it is deemed necessary for the public good, that from the improper conduct of any such county medical society their corporate rights should for a time be suspended, then and in that case, it shall be lawful and just for this Society to make application to the honorable the Legislature for such purpose."

This matter of the standing of delegates to the next annual meeting and their rights of representation is extremely important, because of about 35 counties out of the 60 which have taken action upon this matter 32, or a little more than one-half of the total number, have pronounced against the new by-law which constitutes the new code. If the delegates from these bodies were refused, of course the advocates of the new code, although only about one-tenth of the number of those that have been heard from, would carry their movement through by excluding opposition.

There is much more in this editorial reply to which just exception should be taken, but the point just made involves the whole reply.

In a letter of Dr. Jacobi, published in *The Medical Record* of New York for October 7, 1882, and in an editor's note to this letter there appear some very remarkable statements and teachings, the more remarkable as coming from such high authority. Dr. Jacobi says:

"First.—The abrogation of the Code of Ethics was a surprise to nobody." Dr. Jacobi cannot be well informed on this point, for it was a very great surprise to many, as it could not fail to be from the following history. The President of the Society recommended that "the present code be materially revised" (not abrogated), "possibly a new one made" (see Transactions for 1881, page 10). The committee on the President's recommendation reported as follows: "The committee present that this suggestion of the President opens up an immense range of inquiry, and do not feel that it would be competent or prudent to make at this time any radical propositions, but the committee offer the following resolution for the consideration of the Society:

"*Resolved*, That a special committee of five be appointed by the President, to be designated a 'Committee on the Code of Ethics,' whose duty it shall be to consider the whole question of desirable changes in the code, and who shall present to the Society at the session of 1882 such suggestions on this subject as their observations and investigations may direct."

It will thus be seen that the object in view was a revision of the code—not its abrogation—and that the committee was directed "to present such suggestions on this subject as their observations and investigations may direct." Instead of doing what they were directed to do, and what might be reasonably expected they would do, they make a report which, as is generally admitted, practically abrogates the code. How can it be then that this "abrogation of the Code of Ethics was a surprise to nobody?"

It seems to have surprised the entire profession not only of the State, but of the whole country, for on no general issue ever presented to the profession within the writer's memory has there ever been so prompt or so general an expression of surprise, of regret and of adverse judgment. The committee did deliberate on the subject "through the course of a year," but the result of their deliberations was not known until the report was presented. The definite statement that it was a surprise to nobody can only be justified by the inference that the revolutionary designs of the individual members of the committee were known before they were appointed. But such an explanation is neither true of nor fair to all the members of the committee. Three or four days before the session of 1882 the writer received from a member of the committee a copy of their printed report, with an injunction to keep it strictly private, as it had been shown to only two or three persons outside of the committee. This proves that, although under deliberation for a year, the true character of the report was only known to those to whom the committee chose to send it before it was presented. It was, therefore, a surprise to this member of the Society at least, and the action of the Society upon it was a still greater surprise, because there was no reason to expect from this committee, when acting under such a resolution as that above quoted, anything so revolutionary as the practical abrogation of the code when "suggestions on this subject" were alone asked for. And the adoption of the revolutionary report by a decisive vote led directly to the inference that it was not desired to take the report as being suggestions only for the more mature deliberation of the entire profession of the State. Had the report been discussed and postponed for a year there would have been no difficulty in the way of a fair settlement of the question on an equitable basis, and then if the code was abrogated it could have been said that it surprised nobody. But the motion to postpone an action so revolutionary for a year's deliberation upon it was promptly voted down.

Next, in the same letter, it is stated: "Fifth.—It is a grave mistake on the part of some county societies to tie the hands of their delegates, and to force them to vote one way or the other. This is what they have done when they instructed their delegates for 1883 to vote for reversing the action of the meeting of 1882, no matter what they might hear and learn in the discussions proposed for the next meeting."

Here there is one distinct point at issue, and that is the propriety and right of instructing delegates to representative bodies. It is certainly the profession of the State which is to govern itself by its majority vote and influence. This it does through its primary local organizations. In these—the county societies—all general issues, which are or should be forecast, are decided, and when they instruct a delegate to a representative central organization to vote Yes or No upon a general issue that has been decided upon, they simply carry out the principle of republican self-government.

When a primary organization decides a general issue for itself, no matter upon what grounds the decision be made, it must instruct its delegates to the central or representative organization to present this decision, or otherwise it runs the risk of losing the weight of its decision. Nothing could be more unsafe nor more at variance with the principles of self-government than for a county organization to decide a general issue for itself, and then trust its delegates to the central representative organization to vote as they pleased upon this issue when it came up for general legislation. All questions of such a general application as this and so revolutionary in character should, in entire fairness, be decided by a vote of counties in the State Society, or failing this, only by instructed delegations from all counties where definite action has been taken ; for it must certainly be conceded that county societies have, and must maintain at all hazards, the liberty of deciding such issues for themselves without waiting to hear them discussed in the State Society, and they must send their decisions to the State Society, without risk of their being reversed by the changing opinions of individual delegates. A delegate has the right to resign rather than be the bearer of a decision by the majority of his own organization, which is opposed to his own convictions ; or when a member of the central organization he has a right to argue against the expressed will of his majority, but he has no right to betray the trust of the majority which sends him as its representative when his vote is to be given. He is not, and never should be, free to vote upon his own convictions when these convictions carry his society against its convictions as expressed by its majority vote. If a society refuses or fails in any way to take action upon a general issue, then it simply places itself in the hands of its representative delegates, and their action may fairly govern it.

An instructed delegate who carries out the instructions with which he is intrusted does not sacrifice his own independence nor his freedom of speech, and is not unworthy of his profession because he is the bearer of the will of a majority of his peers. But if he prove entirely worthy of the great trust imposed upon him by his equals he is all the more worthy of trust, confidence and respect if the duty or trust should be in opposition to his own convictions on the subject.

That free discussion which prepares for the deciding of general issues in a State should occur in the primary organizations, namely, the county societies, where the whole profession is directly reached, and there alone should any revolutionary proceeding be decided upon,—for or against,—and the decision should be transmitted by representatives to the representative body, namely, the State Society. This question of radical change in the Code of Ethics is to the profession exactly what an amendment to the Constitution of the State is to the people of the State, and should be decided in the same way—by the votes of the profession at the polls in their primary local organizations. Amendments to the Constitution originate in the central representative body, and after being there discussed are submitted to the people and by them adopted or rejected. The election judge who is instructed by the majority vote to transmit its decision to the representative body loses nothing in independence of character, nor any of his liberties by transmitting a decision which he may have voted against because he believed it was wrong.

The submitting to the dictation of county societies, then, by their delegates, which has been so severely denounced, is not an indignity at all, but a manly duty in support of self-government by majority rule. The writer knows of a county society in which this question has been fully and freely discussed with the greatest freedom of speech, but not with "unbiassed discussion," since one side or the other must have been biased. But after the discussion a vote was taken, and a large majority was in favor of the old code and opposed to the new one. The one delegate from this Society to the State Society, elected by the Society two years ago for the term of four years, is in the minority on this question, and he goes to the next meeting of the State Society as the representative of his Society, uninstructed. Now, if he, being uninstructed, is free to vote upon his individual convictions, then he misrepresents the County Society whose representative he is, and so far betrays his trust. If this supports his independence and his dignity it does so at the cost of the County Society which sends him there to represent its interests, because he deliberately misrepresents the majority and substitutes minority rule. If such a delegate needs no code of ethics for his guidance it will not make the slightest difference to him whether he is instructed or not, for he will either resign his delegateship in time to allow the majority to appoint one from their number, or he will be faithful to his trust and fairly represent his county by his vote. His county does not send him to hear what is said at the State Society, for that he heard last year when the movement was carried through, or has heard and read all that has been said during the year, as his county society has. The place for the discussion being in the county societies, and full and free discussion having been had there, the time for discussion is past, and the time for voting has come—not for individual voting upon individual bias, but for voting by representatives of county action upon the question, or voting by counties. And yet a prominent writer on this point (see *N. Y. Medical Record* of October 7, 1882, p. 418), says: That unless each delegate maintains a personal right to free voting, after having heard what is to be said at the meeting in February next, an impartial and just decision can never be reached. That is, it is the discussion that is to take place in the State Society that is to decide the question, and not that which has already been had in the county societies. This is home rule with an emphasis, when a central organization says to its local constituents, "Gentlemen, your majorities are of no avail to you. You don't know your own minds until you have heard us, for no decision can be just or can suit you that is not of our making."

The latest contribution to this subject of instructed delegates will be found in an editorial article of *The Medical Record* for December 9, 1882, at page 659. The occasion for this article seems to have been the instruction of its delegates by the Kings County Medical Society after it and other county societies had been previously cautioned by the *Record* not to instruct.

Almost all that is argumentative in this article has been covered in the foregoing pages on the subject, but one or two points need attention.

The editor states that the resolutions embodying the instructions to delegates "were only passed by a small majority in a total number of about ninety-one votes," when he knew at that time that the total number of members present and voting was larger than the meeting of the State Society when the change was made, and that the numerical majority was exactly the same as that which pushed the new code through at Albany last year. That is, if the eighteen members who last year voted against the new code had been reinforced from the other side by the Kings County majority of 11, the new code could not have been adopted. The editor also knew that in Kings county the question at issue, and the time at which the vote would be taken were known months beforehand, while neither the one nor the other was known before the Albany meeting, and yet he talks about "machine" methods, "fixing" and wire-pulling of primary political meetings.

The editor says that instructed delegates are converted into "puppets ready to dance when the wires are pulled by the showman," but he says nothing about selected delegates, although he writes very soon after the New York County Society had elected twenty-four delegates whose sentiments were ascertained to be fixed on the subject of their votes, and who were all likely to go to the meeting in February next to vote in one direction; and he knew, too, that beside this, an active canvass was being carried on by enthusiastic members of his County Society for permanent members, who would go and would vote in the same direction. Yet he does not say what the moral difference is between instructed delegates and selected delegates. Nor how to select delegates in county societies, whose delegations do not happen to be susceptible of being "fixed" just at this time.

The editor says that instructions to delegates are of doubtful validity, and that "it would not be surprising if they were declared illegal." He seems to be in a condition to be surprised at nothing, but certainly most people would be surprised if the State Society should undertake to defeat the instructions of its constituent county societies to their own delegates; and the word "illegal" is without the least real value since there is not only no law on this subject, but no basis for any such law.

This gives occasion for the remark that as *The Record* enjoys the distinguished position of being the only journal in the whole nation which has actively espoused the new code, or the no code side of this very important issue, its enthusiasm has to be very great and very strong; and being perhaps nearly as liable to error as those whom its imputations covertly attack and try to injure, its utterances should be carefully scrutinized.

In the *New York Medical Journal and Obstetrical Review* for October, 1882, Dr. C. R. Agnew has a paper entitled "Limits of Medical Ethics," and the very attractive text for his discourse is quoted from Addison: "Where liberty is gone, life grows insipid and has lost its relish." It is to be feared that those who know him best will find a splendid refutation of his entire article in the fact that with liberty gone his life has not grown insipid, nor had it lost any of its relish until he began to reach out in advocacy of liberty for others. If twenty-five years of slavery to "mere sumptuary, proscriptive and trades-union laws and regulations" produces a life of this kind, "emancipation" from it is not so desirable after all. Having found out just where the Doctor got his slavery from, President Lincoln would have "a barrel of it sent to each of the other Generals."*

The sum and substance of this whole matter is the utility of ethical codes, and the question is now: "Shall there be a Code of Ethics or shall it be abrogated?" In order to test any principle of action, it is often useful to extend or project it into such a degree of absurdity that even its friends may be able to see where it leads to. There is one Code of Ethics which has stood its ground for many centuries, and it is both the model and basis of all codes, and if it

* The story as commonly known is, that during the war complaint was made to Mr. Lincoln that one of the most successful Generals was too fond of too much whiskey. The reply was, "Find out just where he gets this whiskey, and send a barrel of it to each of the other Generals."

descended to the detail of special application as mankind progressed, there would be no need for supplementary laws or codes of any kind. How would Dr. Agnew like the idea of joining the party who have so long striven to abolish the Bible in favor of a larger individual liberty of conscience? Nothing could be more repugnant to him than the idea of abolishing this Code of Ethics in the interest of lawlessness under the name of liberty. Then, how can he consistently plead for the abrogation of a code, which is but the special application of the principles of The Code to a special avocation or profession? The moral relation here is precisely that of special statutes to the common law. That is, the principles of the common law are simply extended and developed to special needs by complementary and supplementary statutes or codes. Therefore, there are no "limits of medical ethics" inside of moral law in general, and the reasons why the common moral law in general is not sufficient for medical needs are of precisely the same nature and force as those which have made the common law insufficient except to supply the principles of action upon which to base codes of civil laws, criminal laws, etc. Borrowing an illustration from physiology which can be easily strained away from the point, as Dr. Agnew has strained other illustrations used by this writer, the Code of Medical Ethics is a special sense developed from and upon the general sense of right and wrong. Would Dr. Agnew abrogate the sense of sight, and fall back upon the general sense from which it has been developed for the general good of the economy? He has never been such a leveler, and although he writes on the limits of medical ethics, his own medical ethics are unlimited.

Dr. Agnew writes of "the abrogated code" as if he had now gone over to the more consistent party, which from the first strove for abrogation. Indeed, the present code is doubtless intended to be an abrogation of all codes, and its inconsistencies are fatal to any proper idea of a code. In the discussion in February last, when so much was said about the restrictions of codes and the advantages of the broadest freedom and liberality in consultations, and the individual conscience being the only guide needed in a liberal profession, the writer pointed out that in all consistency this same liberty should be extended to the making and using of secret nostrums,—the holding of patents for medicines, instruments, etc.,—to public and private advertising,—to the giving of certificates of all kinds,—to publishing operations and cures in newspapers, and to quackery in general. In such restrictions as these, which still exist in the new code, is not liberty equally invaded, and is not the individual conscience equally to be trusted without law? Are such restrictions not as much a disgrace to a liberal profession as restrictions upon consultations? Is it not irrational to abrogate, in the name of liberty for individual action, all laws for consultations, and leave the laws for other restrictions which are at least equally oppressive, undisturbed? Such inconsistency, when supported upon the ground of humanity, broad liberality and charity seems very absurd, and hence it is not to be wondered at that Dr. Agnew writes of abrogation and uses arguments which favor abrogation, and are, therefore, against the new code as it stands, so far as it fails to abrogate the old code.

Thus the entire argument of Dr. Agnew and of others, and their appeals for entire individual liberty of conscience, and for individual conscience as the only law,—for that "sturdy individualism,"—does not sustain the new Code of Ethics, but only sustains that part of it which applies to consultations, and condemns all the rest of the code, or those parts which are the same in the new as in the old code, and which, equally with consultations, clash with liberty of individual conscience. Not a single argument is used to sustain liberty in consultation that does not apply with equal force to other liberties which are invaded by the new code in common with the old. Why should individual liberty of conscience be secured for heterogeneous consultations, and be restricted to that, while it is emphatically withheld from self-advertising, from the holding of patents for medicines, etc., from the use of secret or patented nostrums, and from giving certificates to patented articles, wines, health resorts, etc.? All other professions and occupations can advertise as much as they please, can hold as many patents and take as many nostrums as they please, and give as many certificates as they please. It is as much an individual liberty of conscience to do all these things as to hold free consultations, and it is as much of an invasion of this liberty to forbid the one as to forbid the other. Why should there be "Rules Governing Consultations," when consultations themselves are entirely free from any rule, and while one of the parties to all heterogeneous consultations cannot possibly be reached by any such rules? Why have all the rules on "The Relations of Physicians to each other?" Are not the liberties of individual conscience, and the influences by which all other business, social and professional avocations are controlled, sufficient to control these also? Hence, as all the arguments against the old code are equally against all the old parts of the new code, it becomes at once apparent that this party is not in favor of the new code at all, but is in favor of no code; and when these writers talk of the abrogation of the old code ; and their arguments for it are examined, they really mean what they say, and what all their arguments tend directly to, namely, the abrogation of the old code, including, of course, all that is retained of it in the new. Then, as the only new part of the new code is that which abrogates and repeals that section of the old which relates to consultations, it follows rationally that the movement now has clearly resolved itself into an advocacy of no code at all ; and this brings the former advocates of the new code into perfect harmony with the advocates for the substitute for the new code which did away with all codes, and which was rejected at the time the new code was adopted. Therefore, what is now popularly demanded by that side of the question on behalf of full individual liberty of conscience is no code at all, of any kind, and this now is really the issue which has to be met.

To reduce medicine from a profession, dealing with health and life and all the issues involved in these, moral as well as physical, to a free-trade, to be carried on in the same business-like way as all other avocations, with full and free individual liberty up to the limit of statutory criminal law, is the legitimate result of what is now proposed in this revolutionary measure; and before taking the step it will be well to see just what that means by looking at the physician as an ordinary business man or tradesman, emancipated from all restrictions upon his individual liberty of conscience which are not placed by the common statutory law upon other professions and business men in general. The physician now is a business man, say like a lawyer, a broker or a merchant, with just this radical difference, that the physician's dealings are with the occult issues of life and death, and the abstruse and complicated laws of health and disease, while the others deal in lifeless property and its measures of value by the laws of trade. But the physician, like the others, has something to sell, namely, his knowledge and skill, and he has a market in which he meets with all the competition and all the overtrading that the others do, and he has all the liberty of conscience and "sturdy individuality" which they have, to meet these difficulties. Well, then, he must resort to their business practices. Like the lawyer, if he has a bad case and knows it, he must still make a very good case out of it by whatever line of practice his professional conscience may not forbid, because otherwise he will lose his case, and in a business sense this is all there is of it. But is there no difference between the loss of a lawyer's case and a physician's case? The one loses his client's suit, the other loses his patient's life. The engineer may make a bad engine, or repair one badly; the merchant may sell poor goods at good prices, and all may mismanage their business, either with or without conscientious rectitude, but with full individual liberty to do as they please, and the results, affecting as they do mere property, are trivial in comparison with similar results in the business of a physician. That all physicians realize this, and that none ever stoop to the trade practices of other avocations is the assumption of the advocates of no codes of ethics, and that it is for this reason mainly that they, no more than the other avocations, need such restrictions and laws as other bodies of men closely associated in a single interest have always found it useful to impose upon themselves. Codes of ethics in the medical profession are as strictly self-made laws for self-government in matters outside and beyond the common law of the land as is the common law of the most democratic form of government known, and the self-abrogation of such codes or laws is a step in the direction of lawlessness and communism. The question at issue is one between self-government by association of individuals for the greatest good of the whole community in interest, and that of liberty of self-government for the individual, independent of the community, and responsible only to conscience, or, in other words, between law and lawlessness;—to have a simple declaratory and mandatory code of law in professional matters which lie outside and beyond the common law of the land, or to abrogate this code and have none, leaving every individual to pursue his interests in his own way,—this is the simple question, when stripped of all sentimentality and sophistry, and in any community like this, where self-government means government by majorities, it should be decided by the majorities in interest. The ultimate decision will not be reached until a majority of the profession of the civilized world can be heard from. But a majority of the profession of this country can be more easily obtained, and the starting point for this must be a majority of the profession of this State, where the movement originated last year in a sudden and unexpected way and as a surprise to a large part of the profession. The vote to determine this majority is to be had at the approaching meeting of the State Society. At that meeting it is hardly probable that the so-called new code can be sustained; first, because of its absurd inconsistencies, and secondly, because its advocates have gone over to the advocates of no code at all, or the "abrogation of the Code of Ethics," as they all express it. The first question, therefore, to be now decided by the votes of the profession of this State is: Will the profession have a Code of Ethics or not? Next, and conditional upon a decision that the profession will have a code: Shall it be the old code or some consistent and homogeneous modification of it? The profession must make their decisions in the County Societies, where alone the profession lives, works and votes, and must send up their decisions to the representative body,—the State Society,—by their representatives in that body; and they must see to it that their representatives vote in accordance wtth the form of self-government by majority rule and not by self-government by the individual rule, for the representatives sent to the State Society may individually belong to the minority.

Up to this time the following number of counties have taken definite action upon this single subject after discussion, and have voted upon it, with the results stated. At least thirty-five counties have taken more or less decisive action on this special subject, and thirty-two of these have refused to adopt the new code. Of the other three, one asks for the abolition of all codes; one other, namely, Clinton, is represented to have had a meeting of only five members, or least to have recorded only five votes, three of which were for the new code. The greatest unanimity appears to have been in New York county where twenty-four delegates were elected who, it is said, will all go to the meeting and all support the new code or the abrogation of all codes.

In October last the Secretary of the State Society sent out a card, of which the following is a literal copy:

THE MEDICAL SOCIETY OF THE STATE OF NEW YORK,
SECRETARY'S OFFICE, 7 MYERS BLOCK, SYRACUSE, N. Y.
October 14th, 1882.

The *Transactions* for 1882 (a volume of 500 pages), may now be obtained of the Secretary, or of the Treasurer, Dr. C. H. Porter, 55 Eagle street, Albany, for $1 a copy; by mail, for $1.15.

County Medical Societies should not fail to comply with the requirements of the State Society, as to taking their quotas of the *Transactions*. See By-Laws, p. 18, Sec. 11 (Appendix to Trans. of 1880).

Permanent members who have paid their dues for 1882, will please notify the Secretary, if they have not received the copy of the *Transactions* to which they are entitled.

Remittances should be by postal money orders, or bank drafts on New York, payable in all cases to Dr. C. H. Porter, of Albany, whether sent directly to him or to the Secretary.

WM. MANLIUS SMITH, *Secretary.*

P. S.—Every person receiving this circular, is requested to send by postal card to the Secretary a brief message, over his signature, stating whether he does or does not *personally* approve of the plan of leaving to the judgment of the individual physician, whether he shall or not meet, in consultation, legally qualified practitioners, not of his own school in medicine. A general compliance with this request will show what is the prevailing sentiment of the medical profession of the State, on the consultation question. All communications will be treated confidentially, if so desired. W. M. S.

The postscript of this card is, to say the least of it, a very remarkable "circular." Although found upon an official card of the Society, it does not claim to be authorized by the Society, nor to speak for the Society, yet it gets the weight of the Society's most important officer. But setting aside the question of the propriety or impropriety of this use of an official position, the object of the circular and the language by which this object is sought to be attained are so very easily misunderstood that it is comparatively difficult to understand them aright. The true object of the Secretary must be inferred to be the canvassing in a semi-official way of the votes of the individual members of the County Medical Societies of the State on the subject of heterogeneous consultations. But this he expresses as ascertaining "what is the prevailing sentiment of the medical profession of the State," and his call for votes is upon "every person receiving this circular" for a personal vote. Now "the medical profession of the State," in a legal sense, consists not of the membership of the County Societies which make up the State Society, but of the total registry under the late law of all who can show diplomas or their legal equivalents, of whatever kind or so-called school; while, in a general sense, the phrase used embraces all who claim to treat disease. The reader of the card must simply decide for himself whether he belongs to the medical profession, and whether he is a person "receiving this circular," and the result of this decision is the only qualification required to vote on the question, and his vote is to be treated confidentially if this be desired. That is, the vote is to counted, but the name may be withheld. Now it is submitted that any election on such a scheme as this must be most unfair to the true issue involved, and cannot be otherwise than unfair, for the following reasons: First, this card must reach the entire profession of the State, and the entire profession must vote upon it, one way or the other, or else it will fail to "show the prevailing sentiment." Both these conditions are impracticable, if not impossible. But, if possible, such a vote is inadmissible, and does not reach the issue involved, for that issue is not addressed to the medical profession of the State, but only to the constituency of the State Society, and no vote can be fairly counted which is outside of this constituency.

If this card be sent to the six or seven thousand persons who constitute the legally qualified medical profession of the State, and if any large proportion of these reply to it, who is to canvass the votes or to decide which shall be counted and which shall not, and thus decide what is the prevailing sentiment? But suppose the cards should be carefully limited to members of the County Societies, and all replies should be checked off upon the lists of members published in the transactions,—no vote being counted on either side of the question when the name of the voter cannot be found on the membership lists,—still the count being entirely fair, the result, as deciding what the prevailing sentiment is, would be unfair unless a majority of the 3,953 members should be found on one side or the other of the question. That is, there would have to be at least 1,977 votes on one side to ensure the prevailing sentiment. If 1,000 replies were received, and 600 of these on one side, this would not fairly decide the prevailing sentiment, nor would it be as fair as a decision by the County Societies through their organizations, even if no more than 1,000 votes were represented in the decision had at their meetings when the question at issue was under consideration and was submitted to vote.

The true animus of this scheme of the Secretary to canvass the State may be fairly inferred from the fact that he is pretty well known to be earnestly on one side of the question, and knew at the time his card was issued that some twenty-eight or more counties of the State had discussed and voted upon it with only about three or four decisions at most upon his side. This was unsatisfactory, of course, and the possibility that individual votes, confidentially given, and coming from counties which had taken no action on the issue, and would take none, might be obtained in sufficient number to weaken the force of the great preponderance of sentiment as shown through the organized bodies who had taken it up. His plan was not intentionally unfair nor inequitable, yet in application it was both unauthorized and unfair to the issue involved; and why he used language of so very general application, and of a scope so much broader than the question admits, is unexplained. Suppose a constitutional amendment was submitted to the people of the State by the Secretary of State in this kind of a way, how would the plan be characterized and what the value of the result?

The latest prominent action taken upon this subject was at the fifteenth annual meeting of the Central New York Medical Association, on November 21, 1882. This Association embraces some seventeen counties of the State, and meets semi-annually. At the previous meeting the following resolution had been offered, discussed and laid on the table until this meeting:

Resolved, That, in the opinion of the members of this Association, the adoption of specific rules by the State Medical Society for the guidance of physicians in their professional conduct is not deemed advisable, and we would urge the entire abolition of the Code of Ethics now in force, or the substitution therefor of Dr. Roosa's simple declaration which was presented by him at the last meeting of the State Society.

This resolution was originally offered and advocated by Dr. W. S. Ely, of Rochester, who was a member of the committee of the State Society on the Code of Ethics, and therefore one of the authors of the new code adopted last year. In calling up this resolution Dr. Ely made an address, some points of which, as published in the Rochester *Democrat and Chronicle* for November 22, deserve careful attention.

Dr. Ely says: "We all anticipated the treatment the New York State Medical Society received at the meeting of the American Medical Association in June last, for we have learned that wherever there has been a restrictive creed or code, whether in Church or State, there could be no progress in the direction of greater liberty of thought and action which did not meet with much opposition."

This remarkable statement is as radical as it well can be. It strikes directly at all creeds and codes—that is, all formulated beliefs and all compilations of laws by authority—whether of Church or State. When it is remembered that all laws are made by the many for the government of all, and for the control and restriction of the few, and that at the time this address was made not only a majority of the profession of this State, but also a majority of the profession of the whole nation, had spoken as definitely as they could speak through their organized bodies, separately as State Societies, as well as collectively through the American Medical Association, against this abolition of creeds and codes, the whole matter must appear in its true character as an arbitrary movement of the few against the many. Restrictive creeds and codes, whether in

Church or State, do not obstruct progress, but are the bonds which hold society together. They are the objects and the results of organized civilization, and are the principal defences of society against anarchy and communism; and that they are not to be easily overthrown by every movement or attack of a small portion of society against them is of the utmost importance, because under their guidance only can any true, wise or permanent progress be made in the direction of greater liberty of thought and action. It is not the sudden revolutionary action of the few that constitutes progress anywhere or in anything, but the cooler deliberate aggregate or average judgment of the many acting together under their creeds and codes. Enthusiasm and even fanaticism have their beneficent uses in making up this aggregate judgment of the many, but only as secondary elements in any rate of progress, and as such elements they quite as often retard as increase the rate.

Dr. Ely then goes on to say:

"The Committee of the State Medical Society" (of which he was a member and for which he therefore speaks) "merely took account of the widely prevalent dissatisfaction with the old code, and recommended changes which they thought were in consonance with views held by many prominent members of the profession."

In view of the almost unanimous expression of satisfaction with the old codes, not only in this State but over the whole nation, how did this committee ascertain the "widely prevalent dissatisfaction with the old code?" And why, after so general an expression from all over the country has been made, does Dr. Ely repeat the mistaken assertion of the committee and then go on to say for the committee—

"Until the meeting of the Society, in February, 1882, they did not know that so large a number were prepared for the more advanced views embodied in Dr. Roosa's simple declaration. It is to be regretted that the latter was not adopted, for there is as much disappointment felt with the code now in force as with the antiquated one which it replaced, and at the coming meeting of the State Society, to be held in February, 1883, an effort will be made to re-adopt the old code or to still further modify the recent substitute for it."

No one who knows Dr. Ely will for a moment suppose that he meant to misrepresent the state of feeling which has been expressed in the medical profession during the past year. But, misled by his own earnestness for what he considers to be a needed professional reformation, and believing in unwritten rather than in written law, he must suppose that all that part of the profession which has not spoken on this subject is upon his side of the issue. His confusion in the matter is, however, alluded to only for one single purpose, and that is to show how far the enthusiasm of those engaged in this professional revolution to abolish codes of ethics will carry men whose characters, abilities and motives are beyond all question high and good; and to point out that the energies of such men in carrying their points are vigilant and untiring. When so earnestly bent upon such an object as they now have in hand they are almost invincible; so that, if the profession of this State really believes that they are gravely in error in pushing this matter through, and then fails to go to the annual meeting in February to defeat them, the profession will defeat itself in their success, and will well deserve the reproach and isolation it will get from the general profession of the whole nation.

It sometimes happens that members of deliberative bodies become confused by motions and counter-motions and other parliamentary tactics used in the heat of discussion, so as to vote in opposition to their judgment or desire; and perhaps the most of such mistakes occur in voting upon amendments, by the voters forgetting that an amendment to a resolution or motion often annuls or reverses the object of the motion. In a subject of so much importance as this, great care should be taken by every member to see that his vote is given on the side of his deliberate judgment.

The following preamble and resolutions, which were printed and distributed to all the officers of the County Medical Societies nearly a year ago, so that they might be maturely considered, will be offered under the call for "Resolutions" in the regular order of business at the first session of the Annual Meeting of the State Society in February, 1883.

All delegates and permanent members should see that their opinions on this important subject are well considered, and that their votes are recorded for or against these resolutions. Those who desire to repeal the *new* code of ethics will vote for these resolutions, but those who desire to confirm and establish the new code will vote against these resolutions.

WHEREAS, The Special Committee on the Code of Ethics, in its report at the last annual meeting, recommended a change in one part of the code which was more in the nature of a revolution than of a revision, and, therefore may be more radical than was expected or desired by the constituency of this Society; and

WHEREAS, That report was adopted at a session wherein only fifty-two members voted in the affirmative, and thus legislated for the entire profession of the State on a subject of vital importance in a direction which may not have been anticipated or desired by the profession at large;—therefore,

Be it Resolved, That all the action taken at the annual meeting of 1881, in regard to changing the Code of Ethics, be repealed, leaving the code to stand as it was before such action was taken.

Resolved, That a new Special Committee of five be nominated by the Nominating Committee of the society, and be appointed by the society to review the Code of Ethics, and to report at the annual meeting of 1884 any changes in the code that may be deemed advisable.

Resolved, That the report of this Committee be discussed at the meeting of 1884, and be then laid over for final action at the meeting of 1885.

Should this preamble and resolutions be defeated as a whole when put to vote, then the action of this year will stand confirmed by the whole profession of the State, and it will then be definitely settled that the old Code of Ethics needed but little change, excepting that consultation with legally registered quacks of all kinds, which were before prohibited, should now be permitted.

If the preamble and resolutions should be admitted, the preamble would be adopted as a mere recital of the facts, and the test vote would be upon the first resolution. If that was defeated it would necessarily defeat all the others, and would be equivalent to rejecting the preamble and resolutions as a whole. But, should the first resolution be carried, it would leave the whole matter exactly where it was before the appointment of the special committee and then the question would be upon the second resolution. If this should be defeated, the defeat would carry with it the third and dependent resolution, and the effect of this defeat would show that the society was satisfied with the old Code of Ethics as it has stood for so many years; or at least would show that as yet it was not sufficiently dissatisfied with it to run the risk of making changes at present which might prove hurtful rather than beneficial.

If, however, the second resolution should be adopted it would raise a new committee having the same precept or duty as the previous special committee. But this new committee would be appointed in a very different way, and in a way very much more in harmony with so important a matter. The Nominating Committee of the Society being made up anew every year by the delegates and permanent members of each of the eight old senatorial districts of the State, meeting and selecting one of their number for this important committee, is necessarily a very fair and impartial committee and comes afresh very directly from the constituency of the State

Society. If this Nominating Committee of nine men fresh from all parts of the State should nominate this special committee just as they nominate the officers of the Society, and then if the Society should confirm or modify the special committee so nominated, then the committee would be a far better representative of the will and the wishes of the profession at large than if appointed, as the last one was, by the President of the Society.

Should the first and second resolutions be carried and the third one be defeated, then in 1884 the Society would proceed at once to a final action on the report of the committee, and should there happen to be only a few members present the important result would be reached through the bias of a two-thirds vote of the few, and the matter would have to be undone, if afterward it did not meet the approval of the many.

But, if the third resolution should be carried, the subject could be discussed as freely as might be desired, and would then go over for a year until 1885, thus giving plenty of time for any amount of deliberation and writing, and would come up for final action before a new audience fresh from the total constituency of the Society. By this course a much larger proportion of the profession could think and act upon it with the chances for a much wiser decision. An effort was made at the last meeting to have the report of that special committee discussed and laid over for a year so as to come up for final action at the next annual meeting, but the motion was summarily defeated, and a final action was taken which careful deliberation does not sustain, and which probably could not have been taken in February next. This precipitate forcing through of an unexpected revolutionary measure by the mere power of six votes in a meeting of seventy votes, representing a constituency of over 3,800, is a kind of legislation always to be deplored, and which by its very precipitancy and urgency is far more likely to be wrong than right. The whole object of these resolutions is to ascertain whether in this particular instance of this kind, the action taken was wrong or right as judged by the profession to which it is thus arbitrarily applied.

The resolutions will be offered at the first session of the meeting of February, 1883, and the Society will be asked to appoint a special session for their consideration, so that all may be present who desire to be. The evening session of Tuesday was specially appointed for the subject at the last meeting.

Just as these pages go to the printer two more counties are heard from, namely, Warren and Greene, both voting against the new code, so that now the vote by counties stands, after a year's discussion and deliberation, about 34 or 35 against the new code, to 3 or 4 in favor of it, or of no code at all.

PREPARATIONS OF ACONITE.

Through the kindness of Dr. Fred. Hoffmann, of New York, the following information is offered in support of the position taken at page 135 of this volume in regard to the dangerous variability of the aconitia which is used in medicine. Dr. Hoffmann sends the *Pharmaceutishe Zeitung* of Bunzlau and Berlin for February 8th, and 11th, 1882, from which the writer's assistant, Miss M. O. Glover, translates the following abstract of a paper by Prof. Th. Husemann, of Göttingen.

In April, 1880, Dr. Meyer, of Winschotten, died from a dose of about 3 or 4 milligrammes of aconitin nitrate, the preparation of Petit of Paris having been substituted for that of Friedlander, which was intended to be used.

The aconitin nitrate of Petit was in white hard crystals soluble with difficulty in cold water. That of Friedlander was a hard gum-like mass, grayish-white in color and easily soluble in cold water.

The chemists, Huizinga and Plugge, who examined the body of Dr. Meyer were unable to prove the presence of aconitin conclusively, either by chemical reagents or by the physiological test on pigeons.

The aconitins of different makers all differ in strength, and it is even unsafe to assume,—as has been done,—that the "Aconitinum Germanicum" is always the same.

The author of the paper thought at first that the poisoning occurred from the aconitin nitrate of Duquesnel, but found his mistake, and judges from the experiments of Anrep and of Plugge that the preparation of Petit is weaker than that of Duquesnel, though that of Petit was at least 8 times stronger than that of Merck, while that of Merck was 20 to 30 times stronger than that of Friedlander.

It is also stated by the author of the paper, on the authority of Dragendorff, that the same method of preparation being used, a more or less active preparation will be obtained from the longer or shorter exposure to the action of the base used in the precipitation.

Gubler, in 1872, in his therapeutical commentary on the "Codex Medicamentarius," says that pharmaceutical preparations properly made from the aconitum napellus are much more uniform in strength than aconitin or its salts, and that as the former are used in larger quantities there is a greater difference between the medicinal and the fatal dose.

TREATMENT OF TAPE-WORM.

(SUPPLEMENTARY NOTE.)

The writer has had many suggestions and inquiries in regard to the note on this subject published at page 172 of the last number of this journal, showing that many readers had mistaken the scope of the note. It was by no means intended to be an exhaustive treatise on the subject, nor to lead to the inference that the writer was capable of treating the subject fully, but it aimed solely at making one or two points in the treatment of obstinate cases only, and of tænia sodium only. The writer was well aware that a considerable proportion of these are easily dislodged; and that the unarmed variety is commonly as easily dislodged as lumbricoides are, often needing only an active purgative of any kind, but he also knew that the armed variety of tænia was occasionally very difficult to dislodge, and that this difficulty was at least sometimes due rather to the location of the attachment of the head than to the choice of some new fashioned parasiticide. The object was simply to say that many cures of obstinate cases had been effected in the way pointed out.

THE PHARMACOPŒIA OF 1880.

The Revision of 1880 issued in November last is of such primary importance to the objects and interests of these pages that in future they will be mainly occupied in trying to give a practical review and commentary upon it. However imperfect this may be, and whether ever completed or not, it may still prove useful in embodying the experience and information of the writer upon the subjects discussed so far as it may go.

Each person who may wish to avail himself properly of what may be here offered, should of course have a copy of the book and refer to it as each subject or each point comes under discussion, for the text will be quoted only so far as it is used.

As a whole, it must first be said—and can hardly be said with too much emphasis—that it seems to be by far the best Pharmacopœia of the time, and this because it is the result of more labor and research than any other; and this by hands as skillful as those of any other. In its general complexion and tone it is pharmaceutical rather than therapeutical. That is, while its general tendency and tone is to both polypharmacy and polytherapy, its greatest redundancy is in its pharmacy; and this is not at all to be wondered at from the constitution of the Committee of Revision, and from the fact that the pharmacists did almost all the work. While the committee was divided as equally as a committee of twenty-five could be, being composed of thirteen pharmacists and twelve physicians, yet of the physicians in it who were actively engaged in the practice of medicine, or ever had been prominent as therapeutics, the number was small. On the other hand, most of the pharmacists were not only active and able, but were prominent leaders in their branch of the art of medicine. But the prevailing drift of the time seems to be for the medical profession to turn over its most valuable and most important practical interest to pharmacy, and that pharmacy as a trade takes no more advantage of this unsafe and unwise drift, is highly creditable to the leaders of that branch of medicine. That twenty-five men could be found of such ability, who could and would devote so much individual time and labor and skill to such a work; and that one of the twenty-five could be selected as chairman who would harmonize so much individuality with such tact and skill, and at the expense of so much clerical labor, is, to say the least, very fortunate for all the interests involved and very remarkable. While the whole nation is indebted to this committee for this successful work, the committee owes a very large proportion of the success to its chairman.

The "Abstract of the Proceedings" of the Convention from page xv. to page xxv. must be carefully read in order to understand some binding instructions to the committee, which have been faithfully carried out. In carrying out some points of these instructions the committee has already been adversely criticised when the criticism should have been directed to the Convention in the adoption of the plan upon which the revision was to be based.

For example, the method of expressing the quantities by their relations to each other, instead of by a confused arbitrary mixture of weights and measures, has already been pretty severely criticised and charged to the Committee of Revision, when it was directed by the National Convention. At the time of the Convention of 1870, this substitution of parts by weight for arbitrary weights and measures had been discussed for about ten years, and had been adopted by one or more pharmacopœias, and that Convention then directed its Committee of Revision to adopt the method. The committee, however, did not adopt it, and thus the advantages of it were lost for ten years. The Convention of 1880 again ordered its committee to make this change, and this committee, for its greater fidelity to the instructions of the superior body, is now being blamed for perhaps the most laborious and most difficult part of its duty. And this, too, when by common accord the change is one of the greatest of the many improvements of the revision of 1880. Had it been made twenty years ago, as it should have been,—or even ten years ago, as directed by the Convention of 1870,—the whole community in interest would have by this time become sufficiently accustomed to it to realize its advantages.

Next follows the preface, in which the committee explains in general terms how it carried out the instructions of the convention, in the changes of contents and arrangement of the work. Here will be found the rules adopted for the use of synonyms, cross-references, nomenclature, etc. One change noted here on page xxx, and not noticed elsewhere, is the general change in the strength of the Fluid Extracts. These, from having previously represented the drugs from which they were made in the proportion of minim for grain, are now about five per cent. weaker, the minim representing about ninety-five hundredths of a grain. This is so slight a change that, when once fully known and recognized, it is not very important, since fluid extracts made of this strength from drugs fully up to the officinal standard will be quite as strong as those made from the average drugs of the common market by the old standard. This change could not be very well avoided and have the formulas as uniform and symmetrical as they are. The change in strength depends upon the difference between the gramme and the cubic centimeter in the adoption of the metric system, to replace the 480 grain troy ounce, and the 480 minim fluidounce. Yet the older and better standard could have been more nearly approximated and the metric system be still used if 100 grammes of drug had been made to yield 95 cubic centimeters of fluid extract.

The Revision of 1870 contained 970 titles. The present revision, 997, or only 27 more than the old. The titles dismissed from the old, number 229, and those added, 256; difference, 27. The pharmaceutical preparations dismissed are 106, and those added are 150; difference, 44, this difference being made up mainly of 33 fluid extracts more than before, and the new class of abstracts 11 in number; 11 new syrups and 16 more tinctures.

A few of the tables directed by the Convention could not be prepared in time, and the committee expect to give them in a supplement, thus indicating that a supplement is in contemplation.

Next follow the "Preliminary Notices." Here the old and convenient definitions for fineness of powders are usefully elaborated so that the numbers can be used instead of the previous less definite expressions. The only indefinite expression here is found in the last sentence, which is as follows:

When a substance is directed to be in powder of a limited degree of fineness, as specified, by the number of meshes to the linear inch in the sieve, not more than a small proportion of the powder should be able to pass through a sieve having ten meshes more to the linear inch.—*U. S. P.*, 1880, page xxxv.

The "not more than a small proportion" is generally about one-fourth part.

The Notice on Percolation is a definite and clear description of the process as generally applicable to pharmacopœial uses, and a figure of the apparatus and more detailed description of the process will be found in a paper published by the writer, in the Proceedings of the Amer. Pharm. Asso. for 1878, at page 708—the figure at page 739. The text of the Notice does not agree with the process as given in the body of the work exactly, for, under fluid extracts the old and inferior plan of stopping the outlet of the percolator with a cork is directed. Since without the rubber tube as described in the Notice, the rate of percolation cannot be properly controlled, it is a mistake to omit it from the text of the Pharmacopœia, because the process given there is objectionable, and pharmacists may not always refer to the Preliminary Notices for the better one. At the end of this notice the following sentence occurs:

Modification of the above Process.

Authority is given to employ, in the case of fluid extracts, where it may be applicable, the process of repercolation, without change of the initial menstruum.

The process of repercolation to which allusion is here made, is described in detail in the Proceedings of The Amer. Pharm. Asso. for 1878, at pages 708 *et seq.*, and with due deference to the judgment and the high authority of the committee, it is the process which should have been adopted for the Pharmacopœia, simply because it yields better results than that adopted, and is in general successful use. By adopting an inferior process because it is easier and more convenient, the Pharmacopœia assumes the position that pharmaceutical convenience is of more importance than therapeutic value and uniformity. The chief reasons why repercolation is the best process, in view of therapeutic use, is that it avoids all heating, which is in general so destructive to the active principles of vegetable substances, and yields more uniform preparations which keep better, and that its disadvantages and inconveniences are not great enough to overcome these advantages, nor even to overcome the first one of them when seen from the side of the physician. This being true, and the common practice of the time being repercolation, the Pharmacopœia puts itself behind the age by reversing the proper order of this notice and its practice. It should have adopted the best process, namely, repercolation, and have given the older heating process as a permissible alternative.

SPECIFIC GRAVITY.

The specific gravity of liquids should be ascertained, if accuracy is required, by means of a specific gravity bottle of suitable capacity, at a definite temperature. The specific gravity of alcohol or of any mixture of alcohol and water may, however, also be ascertained by means of an accurate hydrometer, preferably that prescribed by the United States Government for the use of internal revenue and custom-house officers.

Whenever specific gravity is mentioned in the Pharmacopœia, without reference to temperature, it is to be understood to refer to a temperature of 15° C. (59° F.)—*U. S. P.*, 1880.

A specific gravity bottle for pharmaceutical uses need only be accurate in proportion to the fineness of the scale and weights with which it is to be used, and a high degree of accuracy is but a waste of time and appliances in a very large proportion of pharmaceutical work. There is no better specific gravity bottle than one which any pharmacist can make for himself from a common vial or small flask, and for ordinary use it need not be smaller than 100 grammes, the error of weighing being smaller the larger the bottle. A common vial of 3 or 4 fluidounces capacity, with a small tube thermometer are all that are needed. Put the thermometer in the bottle and tare them together. Then nearly fill the bottle with distilled water and bring it to the required temperature, and with the thermometer resting in the bottle, complete the filling to the narrow commencement of the neck, where the line can be easily seen; mark this point with a file, and weigh the whole to the nearest grain or decigramme. Then subtract the tare to obtain the weight of the water in whatever system of weights is to be used. This weight of water is the divisor to be applied to any other liquid weighed in the same way. Suppose the water weighs 91.2 grammes or 1407 grains, and the same volume of alcohol, at the same temperature, weighs 79.6 grammes or 1228 grains. Then 79.6 divided by 91.2 gives the specific gravity at the temperature assumed, namely, ·8728, or practically ·873. Or, 1228 divided by 1407 gives the same figures, nearly.

Hydrometers are frequently used because they are supposed to be easier of application, but as a rule they are quite inaccurate, while their inaccuracy is difficult to detect, and they cannot be applied to small quantities of liquid.

The change of the standard temperature for specific gravities from 15.6° C.=60° F. to 15° C.=59° F. by the present revision, disturbs all the old specific gravities in a way that is confusing. This is referred to in the next notice.

TEMPERATURE.

When there is occasion to indicate the degree of heat or of cold, the scale of the centigrade thermometer, or, in its absence, that of Fahrenheit's thermometer, is to be employed. (See the tables on pages 402–406.)

By the term *gentle* heat is meant any temperature between about 32° and 38° C. (about 90° and 100° F.)

15° C. (59° F.) has been adopted, in accordance with the prevailing usage in modern chemical literature, as the standard temperature for the solubility of substances in liquids and for taking specific gravity. In the case of alcohol and wine, however, the temperature of 60° F. (15.6° C.) has been, for the present, retained, since all the laws and regulations of the United States referring to alcohol and alcoholic liquids in general are still based on this degree of temperature. The Table of Percentage and Specific Gravity of Ammonia (page 425) is based upon the temperature of 14° C. (57.2° F.)

When a liquid is directed to be freed from alcohol or other volatile menstrua, at a limited temperature (as, for instance, in the preparation of extracts), the evaporation may be conducted with greater economy and less risk of injuring the product, by using a vacuum-apparatus of suitable construction.—*U. S. P.*, 1880.

The change in the standard temperature here alluded to is of doubtful utility. The modern chemical literature, where the usage prevails, is as yet by no means common or universal even in continental Europe, and it has not reached medicine or pharmacy yet by any demand or need for it, and it here comes into it as a confusing and disturbing element at this time. The change is, fortunately, not a great one, and must now be accepted, but so far as it is a change it is a step in the wrong direction. The standard temperature was already so low as to be a very considerable stumbling-block in the uses of specific gravity as a test of quality in pharmaceutical liquids, and the need has been so great for a standard nearer to that of modern living and work rooms that for some years past the temperature of 25° C.=77° F. has been coming into use by the mere weight of its advantages, and tables of equivalency were only needed to bring it still more rapidly forward. It is very easy and takes much less time to bring a liquid to this temperature in any climate or season, while the lower temperature requires an artificial cooling more troublesome at all times, and in some seasons not attainable without the use of ice. Then, again, specific gravities are the more accurate as well as the more easily taken the nearer the temperature is to that of the room in which they are taken. Had the Pharmacopœia changed its standard to 25° C.=77° F., or had it always given this temperature as an alternative, as it does sometimes, its specific gravities would have been more frequently used, and it would not have been long before the value of specific gravity indications would have been more fully recognized and realized. Now there are two standard temperatures, the new one for general use and to be understood without being given, and the old one for alcohol and wine, which is given whenever used. The reverse of this would have been a more natural order, namely, to give the new temperature whenever it was used, leaving the old to be understood. The confusion made by the new temperature is illustrated in the case of ether. In the revision of 1870, stronger ether was defined as having a specific gravity not to exceed ·728 at 15.6° C.=60° F. In this revision of 1880 it is to be not higher than ·725 at 15° C. (59° F.), or ·716 at 25° C. (77° F). Now the strength of the ether is really not materially changed, yet the figures are so much changed as to represent a considerable difference to the ordinary reader. At least, he would not be likely to conclude that there was no practical change in strength, but only a change in the temperature at which the s. g. was taken. Nor could he verify one conclusion or the other short of a troublesome calculation.

Under the notice on Weights and Measures there is a very clear, succinct and useful account of the different systems used and their comparative values. In prescription writing the abbreviation for "grain" is to be written with a small initial letter as "gr.", while that for gramme and cubic centimetre are written with a capital initial as "Gm, C. c." This is a nice distinction, and perhaps a good one, but one or the other way is incorrect, and the use of capitals is not common, while the abbreviation to "gram." and "c. c." are common. The spelling of the words "Liter" and "Meter" and the derivative centimeter is not common, and will be generally thought to be incorrect, but the writer is not capable of noticing it on any better grounds than common usage,—the original French source from which the words came, and some bad analogies. But there are such analogies as "thermometer," "barometer," etc., whose similar spelling every one admits to be the only good usage.

The text of the Pharamacopœia proper then begins with

ABSINTHIUM.

ABSINTHIUM.

[WORMWOOD.] —*U.S.P.*, 1880.

This article the writer knows nothing of in medicine, having never seen it, nor heard of its being prescribed in an experience of forty years, although it has been in the Pharmacopœia since 1840. Its officinal standing was very weak at one or two revisions, but is now strengthened by the introduction of a new preparation, into which it enters.

ABSTRACTS.

This is an entirely new class of preparations, and under a new name not before known in medicine. The class is introduced by the committee at page xxxi. of the Preface by the following paragraph:

To supply a demand, which has arisen for dry, powdered extracts, a new class of preparations has been introduced under the title of "Abstracta." As will be seen on examination, these are just twice the strength of the crude drug, or about twice the strength of the corresponding fluid extracts.

The demand for a class of dry powdered extracts has, in the writer's experience, not been great, and what demand there was came from pharamacists rather than from physicans. Several powdered extracts have been long in common use, and a few others have been more recently advertised into use, the supply being used to create a demand. There is, however, an undoubted advantage and convenience, or perhaps a necessity for having a few powdered extracts, and for having these to bear an accurate, known relation to the drug, and for having officinal formulas for such, but whether these Abstracts fulfill the conditions in the best way may be doubted.

The chief objection to them is that they require a troublesome, expensive and hurtful process to effect so little in the way of concentration, condensation and convenience. For instance, a pound of the powdered drug costing not above forty cents per pound in any case excepting one, is represented by half a pound of abstract costing at least four or five times as much with a concentration of but one-half in strength and, therefore, in the size of the dose. The physician who desires to give sixteen grains of powdered conium seed at a dose, would have to give eight or ten grains of the Abstract in order to represent it, while of the present officinal extract he would only need about three grains. Therefore, the extract would be far the better preparation, and it could be made in the condition of a powder that would be much stronger than the Abstract by the use of less diluent. With the exceptions of Belladonna and Senega, all the abstracts could have been made much stronger. Almost all of them could have been made to represent the drug in the proportion of one grain to four, and seven out of the eleven could have been made of the strength of one to five as easily as they are now made one to two, and the main question as to their utility will be, whether, therapeutically, it be worth while to go through such processes to gain so little. The probable reason why many of them were not made of greater strength is that a few—or two of them could not be made so, and it was considered best to sacrifice the nine to the two in order to have them bear a uniform proportion to the drug. This may be good pharmacy, but it is bad therapy or therapeutics, because the doses and uses are not materially improved by this uniformity, nor benefited in any other way. Nor will this class as so constructed supply the demand for powdered extracts if these should be made of greater strength, and each bearing an accurate and definite relation to the average quality of the drug from which it is made, without straining for uniformity between ununiform drugs in their relation to each other. These circumstances seem to call for the remark that the new class of preparations here originated will be likely to prove more profitable to the manufacturing pharmacist than to the therapeutist. But for such a conclusion to be trustworthy the verdict of time and experience must be waited for. The authority of the National Pharmacopœia, aided by the advertising of manufacturers, will be sure to bring these novelties into professional notice and use, and secure for them an extended trial. Besides this, either by the officinal process or by more simple processes to be given under each Abstract, every pharmacist or physician can and should make these preparations for himself, and thus supply his own demand for them. Hence there is no danger that they will not be fairly and fully tried, as they ought to be in deference to high authority in an age of process.

Had these preparations been called powdered extracts, and had their processes been made supplementary to those for the officinal extracts of which they form a part, and to which they naturally belong, and had each been made as strong as was practicable without injury, their chances of officinal permanency would have been much improved.

ABSTRACTUM ACONITI.

ABSTRACT OF ACONITE.

Aconite, in No. 60 powder. *two hundred parts*	200
Tartaric Acid, *two parts*	2
Sugar of Milk, recently dried and in fine powder,	
Alcohol, each, *a sufficient quantity*,	
To make *one hundred parts*	100

Moisten the Aconite with *eighty* (80) *parts* of Alcohol, in which the Tartaric Acid has previously been dissolved, and pack firmly in a cylindrical glass percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Aconite is exhausted. Reserve the first *one hundred and seventy* (170) *parts* of the percolate, evaporate the remainder to *thirty* (30) *parts*, at a temperature not exceeding 50° C. (122° F.) and mix with the reserved portion. Place the mixture in an evaporating dish, and, having added *fifty* (50) *parts* of Sugar of Milk, cover it with a piece of thin muslin gauze, and set aside in a warm place, where the temperature will not rise above 50° C. (122° F.) until the mixture is dry. Lastly, having added enough Sugar of Milk to make the mixture weigh *one hundred* (100) *parts*, reduce it to a fine, uniform powder.

Preserve the powder in a well-stopped bottle.—*U. S. P.*, 1880.

It should be carefully noticed and remembered that all preparations of Aconite are now made from the root, while the names are those hitherto applied only to the feebler preparations of the herb. For example, the Extractum Aconite of the Pharmacopœia of 1870 was made from the dried leaf, while the Extractum Aconite of the present revision of 1880 is made from the powdered root, and is therefore about nine times stronger than the preparation of the same name in the revision of 1870, and there is nothing to indicate this difference in the new formula of 1880. This is in conformity to a rule adopted by the committee (see Preface, page xxviii., rule 2, on Nomenclature). It would, however, have been better and safer to have used "Aconite Root" as a synonym under each preparation, rather than to trust entirely to the definition at page 24, and to the table of changes of name at page 447. In the table of changes of strength, at page 454, there are merely the words "leaves" and "root."

In the process for this preparation, the first step is to make a fluid extract; and this fluid extract is practically identical with the Fluid Extract of Aconite at page 100. It is therefore to be understood that an equivalent proportion of the officinal fluid extract may be taken, and thus the first step of this process may be avoided. Why the Fluid Extract is not directed in the formula is not understood.

The use of Tartaric Acid in this preparation and in the Extract, Fluid Extract and Tincture, seems objectionable. It originated with Duquesnel in his modification of the process for aconitia, and the practice has been followed by Wright and others with great advantage to the process for extracting the alkaloid, as it is less hurtful in the process than the stronger acids previously used in extracting the alkaloid. But it has never been shown that the tartrate is either better or more stable in the preparations than the natural aconitate of the root, and the probabilities are that it is not. Then, as it is an important object in these preparations to preserve the active principle as nearly in its natural condition as possible, unless this condition be unstable, and as preparations of aconite root made without acid are not unstable, it is probably unwise, and certainly unnecessary, to break up the natural salts by chemistry, especially as in this case it has been proved by long experience that the natural aconitate is permanent, while this permanency has yet to be proved in regard to the artificial tartrate. Alcohol alone is an excellent and sufficient menstruum for aconite root, and a more dilute alcohol than that officinally used would probably be better. It is understood that the reason for using Tartaric Acid are mainly, first, that with it the exhaustion is more rapid and easy; and second, that it better protects the alkaloid through the heating process. A critical trial made by the writer proved that the exhaustion is neither more rapid nor easier with the acid; and as no heat need be used, the second reason is invalid. Under these circumstances this writer will continue to use alcohol alone in his practice with these preparations until it be shown that the addition of Tartaric Acid is needed, or that it improves a preparation already found by long experience to be an excellent one.

When the powdered Sugar of Milk is added to the Fluid Extract, and the mixture is set aside to evaporate, as directed, a very long time is required for this step. In a portion representing 10 troy ounces of the powdered root, five days' time was needed to effect the evaporation, although the mixture was frequently stirred, and it is doubtful whether this long exposure, even at the low temperature directed, be not hurtful, or even more hurtful than a shorter exposure to a somewhat higher temperature. If the dish be shallow, the evaporation goes on rapidly enough until the mixture becomes a tough tenacious mass of a pilular consistence, but after this it dries very slowly indeed. It is far better practice to evaporate the Fluid Extract without the Sugar of Milk and incorporate this at the end, for in this way a portion of similar size can be made in 24 hours. But these Abstracts generally are not well made on a large scale, and are appropriate only to the dispensing pharmacist, at least until they prove to have therapeutic advantages to justify a general usage. Each dispensing pharmacist can easily make them for himself on the scale of his own demand by the following process:

Take of Fluid Extract of Aconite Root 30 cubic centimeters=480 grains of the root. Powdered sugar of milk a sufficient quantity.

Put the Fluid Extract upon a flat-bottomed dinner plate and allow it to evaporate spontaneously, without heating, for 24 or 36 hours. At the end of that time there will remain on the plate a thin layer of solid extract weighing about 4.85 grammes=74.85 grains, or 15.6 per cent. of the powdered root represented. Add to this 10.7 grammes=165 grains of powdered sugar of milk, warm the plate and contents until it can be just comfortably held in the hand, and incorporate the melted extract and powder by means of a stiff spatula. When thoroughly incorporated and cold, remove the mixture from the plate, weigh it, and add enough powdered sugar of milk to make the whole weigh 15.55 grammes=240 grains. Finally rub it to a fine uniform powder, sifting it through a No. 60 sieve. After the evaporation the time required is about half an hour.

This makes a light brown powder, each grain representing two minims of the Fluid Extract, or two grains of powdered aconite root.

This powder is much too strong to be placed upon the tongue of a patient. The dose being about half a grain it must be diluted or shielded in some way for administration. If made into a pill, or put into a capsule, it possesses no advantages over the Fluid Extract. Indeed, a capsule half filled with powdered sugar of milk, with a minim of Fluid Extract dropped upon it would be a better dose.

It is difficult to recognize the therapeutic uses or convenience of this preparation, and if it has no special value it is objectionable as complicating the pharmacy of a dangerous but very important drug.

Aconite is almost entirely used as a cardiac and arterial sedative, and its primary effect is to reduce pulse rate and temperature. Hence its utility in ephemeral fevers, and indeed in febrile action generally. It is almost always given uncombined, and is best used in moderate or small doses frequently repeated, and this preparation has no special adaptation to these uses.

ABSTRACTUM BELLADONNÆ.

ABSTRACT OF BELLADONNA.

Belladonna Root, in No. 60 powder, *two hundred parts*	200
Sugar of milk, recently dried and in fine powder.	
Alcohol, each, a *sufficient quantity.*	
To make *one hundred parts*	100

Moisten the Belladonna root with *eighty* (80) *parts* of alcohol and pack firmly in a cylindrical percolator; then add enough alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding alcohol, until the Belladonna root is exhausted. Reserve the first *one hundred and seventy* (170) *parts* of the percolate, evaporate the remainder to *thirty* (30) *parts*, at a temperature not exceeding 50° C. (122° F.) and mix with the reserved portion. Place the mixture in an evaporating dish, and, having added *fifty* (50) *parts* of Sugar of Milk, cover it with a piece of thin muslin gauze and set aside in a warm place, where the temperature will not rise above 50° C. (122° F.) until the mixture is dry. Lastly, having added enough Sugar of Milk to make the mixture weigh *one hundred* (100) *parts*, reduce it to a fine, uniform powder.

Preserve the powder in a well-stopped bottle.—*U. S. P.*, 1880.

The title of this preparation is in apparent though not in real conflict with rule 2 on Nomenclature at page xxviii. of the preface. "But if more than one part" (of a plant) "is in use, the part is to be specially mentioned in the title.

These rules apply only to the title of the drug as found in one place, and not to the titles of the preparations of the drug or plant At page 53 the rule is carried out and "Belladonna Leaves" and "Belladonna Root" are separately titled and described, and the preparations into which each title enters are given. But in the titles of the preparations the part in use is not given, although it is designated in the formula for the preparation which comes just below the title. When this is once fairly understood, perhaps there is no danger of confusion. But the Pharmacopœia is now strictly alphabetical, and is referred to as a dictionary is, and a person who refers to the preparations of Belladonna without going farther than the titles is not cautioned or reminded that there are two parts of the plant in use, the one much stronger than the other. In the case of Belladonna, the root is about one-third stronger than the leaves, and any accurate medication by it requires that this should be recognized. The committee simply judge that it need not be recognized in the titles of the preparations if recognized in the titles of the drug and in the formulas of the preparations. These remarks apply to all cases where more than one part of a plant is officinal, and where the parts differ in strength as widely as they do in Belladonna.

The first part of the above process is practically identical with the process for the Fluid Extract, and, therefore, the process is shortened and simplified by taking an equivalent proportion of the Fluid Extract of Belladonna (root).

Then, as 200 parts of Powdered Belladonna Root are equivalent to 201 parts of the new officinal Fluid Extract, or to 191 parts of a well-made Fluid Extract by repercolation and more accurately representing minim for grain, it is practically only necessary to substitute Fluid Extract of Belladonna Root for the powdered root, and place this in an evaporating dish, etc., as directed. If the Abstract be made on a scale of 200 grammes of the powdered root, then 210 c. c. of the Fluid Extract being the equivalent of this, will be the quantity to be taken. These formulas and processes for Abstracts are all alike in manipulation, and it was shown in the case of the Abstract of Aconite that it was very objectionable to add the sugar of milk before the evaporation, for reasons there given, and, therefore, that the evaporation should first be completed or be nearly completed. By far the best way, however, is to make the Abstract in small quantities, and avoid heat altogether, as follows: Take of Fluid Extract of Belladonna Root 31.5 c. c., if of the new officinal Fluid Extract or 30 c. c. if of the older minim for grain strength,—either of these will represent 480 grains of the powdered root,—and of powdered sugar of milk a sufficient quantity.

Put the Fluid Extract upon a flat-bottomed dinner-plate, and allow it to evaporate spontaneously at the ordinary temperature for 36 hours. At the end of that time there will remain a thin layer of solid extract weighing about 9.35 grammes, or 144.29 grains=about 30 p. c. of the powdered root represented. Add to this extract 6.2 grammes=95.7 grains of powdered sugar of milk, warm the plate and contents until it can hardly be held in the hand, and incorporate the softened extract and powder by means of a stiff spatula. When thoroughly mixed and cold remove it from the plate, weigh it and add powdered sugar of milk to make the whole weigh 15.55 grammes=240 grains. Finally, rub it to a uniform powder, sifting it through a No. 60 sieve. Standing in a bottle for a few days these powders cohere slightly, but they do not run together, and are easily broken up. After the evaporation the time required to make the Abstract in this way is not more than half an hour.

The powder is of a light brown color, and represents the powdered root from which it is made in the porportion of one part to two, or half a grain to the grain.

The ordinary dose of Belladonna Root is about 2 grains, or the equivalent quantity of 2 minims of the Fluid Extract, and this dose is repeated, according to circumstances, every 2, 3 or 4 hours, until the pupils dilate and the mouth and fauces become dry. The equivalent dose of this Abstrct would be one grain, and it would generally be given in a capsule or a soft pill. Indeed, there is hardly any other way in which it could be given, and if so, the same capsule half-filled with powdered sugar of milk, or any other absorbent powder, would receive and secure the equivalent 2 minims of Fluid Extract, and be given with equal facility and convenience, so that there really seems to be no necessity for this preparation when the Extract, Fluid Extract and Tincture are supplied and already well known.

ABSTRACTUM CONII.

ABSTRACT OF CONIUM.

Conium, in No. 40 powder, *two hundred parts*	200
Diluted Hydrochloric Acid, *six parts*	6
Sugar of Milk, recently dried and in fine powder,	
Alcohol, each, a *sufficient quantity*,	
To make *one hundred parts*	100

Mix the Hydrochloric Acid with *eighty* (80) *parts* of Alcohol, and, having moistened the Conium with the mixture, pack firmly in a cylindrical glass percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol until the Conium is exhausted. Reserve the first *one hundred and seventy* (170) *parts* of the percolate, evaporate the remainder to *thirty* (30) *parts*, at a temperature not exceeding 50° C. (122° F.), and mix with the reserved portion. Place the mixture in an evaporating dish, and having added *fifty* (50) *parts* of Sugar of Milk, cover it with a piece of thin muslin gauze, and set aside in a warm place, where the temperature will not rise above 50° C. (122° F.), until the mixture is dry. Lastly, having added enough Sugar of Milk to make the mixture weigh *one hundred* (100) *parts*, reduce it to a fine, uniform powder.

Preserve the powder in a well-stopped bottle.—*U. S. P.*, 1880.

The use of Hydrochloric Acid in this formula, and that for the Fluid Extract to replace the Acetic Acid as originally proposed by Proctor and adopted in the Revision of 1860, but changed to Hydrochloric in 1870, is a change of doubtful advisability, and this point will be discussed under the Fluid Extract.

In the Revision of 1870 two forms of Conium were officinal, the leaves and the fruit or seed, and the Extract, Alcoholic Extract and Tincture were all made from the leaves, and were called simply Extract of Conium, etc. The Fluid Extract alone was made from the seed, and the title was Fluid Extract of Conium Seed.

In the Revision of 1880 the leaves are very properly dropped as feeble at best, and very uncertain and perishable. Then by the rule of the Preface at page xxviii, the seed being the only part retained takes the title of Conium simply, and from the seed all the preparations are now made. Hence it happens that all the preparations whose titles where heretofore Extract of Conium, Tincture of Conium, etc., and which were made from the feeble leaves, are now without any change of title made from the stronger seed, so that without change of name they are now more than five times stronger than before.

The process for this Abstract is exactly like that for the foregoing Abstracts, and all that was said there applies with equal force here, and the same simplified formula and process are applicable here only with still greater advantage over the officinal process in the avoidance of all heating. Of all drugs Conium is perhaps most injured by heat, and it is, therefore, almost certain that this preparation made by the officinal process, which requires heating to about 50° C.=122° F. for four or five days, would be inert. Made in small quantity by the process given under Abstract of Belladonna, it doubtless loses somewhat, but far less than when heated. The fluid extract yields by spontaneous evaporation about 15.82 p. c. of extract, and, therefore, a much stronger Abstract than two to one could be made from it if desired, and as the dose is much larger than in some of the others, a greater concentration would have made this a more useful preparation. The Abstract consists of seventy-six parts of extract and one hundred aud sixty-four parts of Sugar of Milk, when it would be as easily made with forty-four grains of Sugar of Milk, and would then be double the present strength and would represent the powdered seed in the proportion of one to four.

The officinal Abstract is a whitish powder of the strength of one to two of the powdered Conium seed.

The dose of Conium being large and the Fluid Extract being a rather nauseous preparation, there seems to be reason for some such preparation as this Abstract, but these reasons would require the preparation to be as strong as practicable. The doses of Conium and its preparations are generally very much understated, and where such small quantities are given the medicine is useless. Twelve to sixteen minims of a well-mede Fluid Extract of the unripe fruit (called seed) is required to produce a moderate effect, and such a quantity is about a medium dose. Six to eight grains of this abstract, if made without heat, would somewhere nearly represent such a dose. Either of these quantities could be put into two capsules, and the dose would be thus much more easily taken than the equivalent dose of Fluid Extract. But it would be still more easily taken if of double the strength, as it should be. The extract, if made without heat, and given in pill, would, however, be still better, as a dose of 2½ grains would represent 16 minims of Fluid Extract.

ABSTRACTUM DIGITALIS.

ABSTRACT OF DIGITALIS.

—*U. S. P.*, 1880.

The formula and process for this Abstract being exactly like that for the Abstract of Belladonna, with only the name of the drug changed, it is unnecessary to repeat it here.

The same objections occur in the practical application of this process as were noted under Abstract of Belladonna, and the same substitute process is equally applicable, so that it is only necessary to refer to them.

Well-made Fluid Extract of Digitalis, from good leaves of the second year, yield by the spontaneous evaporation directed, about 24 p. c. of extract, so that this Abstract might have been made to represent the drug in the proportion of one to three, had the committee so desired, but as the dose of digitalis is small, this is of the less importance. This same circumstance, as in the cases of Aconite and Belladonna, render the Abstract itself of but little importance.

When made without heat by the substitute process, the Abstract is of a good green color, and has a strong digitalis odor. Within a few hours or days after being put into a bottle the powder contracts very much and adheres in a pretty solid mass. This is, however, pretty easily broken up in the bottle by means of a stiff spatula, and is then easily rubbed into powder again.

The dose of Digitalis is not over one or two grains, or one or two minims of the Fluid Extract, and such a quantity of the latter, which is by far the best preparation of this drug, is so very easily taken, either in water or dropped upon powdered sugar of milk in capsules, that the most fastidious persons would be satisfied with one or the other. The reduction of such a dose to one-half the quantity does not seem to justify this addition to the preparations of digitalis.

ABSTRACTUM HYOSCYAMI.

ABSTRACT OF HYOSCYAMUS.

—*U. S. P.*, 1880.

This formula and process are the same as that for Belladonna, with only the change in the name of the drug and the additional direction that the Hyoscyamus be recently dried.

The objections to the manipulation, and the substitute process are both equally applicable here, and therefore need not be repeated.

If for the 200 parts of powdered Hyoscyamus 200 grammes be taken, then the equivalent of the new officinal Fluid Extract is about 199 grammes, or 210 c.c.

If a well-made Fluid Extract by repercolation, representing the drug in the proportion of minim for grain, be taken, then the 200 grammes of powder will be represented by about 189 grammes, or 194 c.c. of the Fluid Extract.

Good biennial Hyoscyamus yields a Fluid Extract by repercolation, which when of the former value of minim for grain, gives by spontaneous evaporation as directed, about 18.5 per cent. of solid extract. That is, 30 c.c. of the Fluid Extract, representing 480 grains of the drug gives 5.76 grammes=88.89 grains of extract, which has to be made up to 15.55 grammes=240 grains of Abstract with the powdered Sugar of Milk. This proportion of Sugar of Milk being very much larger than is necessary to convert the extract into powder, the Abstract might easily be increased in strength, certainly to the proportion of one to three, and probably to one to four instead of one to two, of the drug, and this to great advantage, as the dose of Hyoscyamus is large.

This Abstract, as made of the officinal strength by the substitute process, is of a greenish-gray color, and has the Hyoscyamus odor well marked. The powder shrinks and coheres a little on standing, but less than some of the other Abstracts.

The dose of Hyoscyamus is universally very much understated, and its medicinal uses and effects are as commonly lost through this mistake of the authorities. Long ago Dr. John Harley showed (see Old Vegetable Neurotics, p. 330) that one fluidounce of the British Pharmacopœia Tincture is required to procure sleep. This is equal to about 56 grains of the powdered drug, or nearly a fluidrachm of the Fluid Extract, or say 28 grains of this Abstract when of the strength of one to two, and such a dose of a powder would be more difficult to administer than a fluidrachm of the Fluid Extract.

Neither would the Abstract offer any special advantage in combining hyoscyamus with conium or with opium, since its great bulk or volume would still be very much in the way.

ABSTRACTUM IGNATIÆ.

ABSTRACT OF IGNATIA.

—*U. S. P.*, 1880.

The writer has no experience whatever with this drug, nor with any preparation made from it. According to the best authorities it is a mere duplicate of nux vomica, containing the same active principles but in a more variable proportion. This disadvantage does not seem to be counterbalanced by any known advantage over nux vomica, and if not, then Ignatia is a useless complication of the already overloaded materia medica.

ABSTRACTUM JALAPÆ.

ABSTRACT OF JALAP.

—*U. S. P.*, 1880.

The formula and process for this Abstract are exactly the same as for the Abstract of Belladonna, with only a change in the name of the drug. But there is no reason why they should be the same, as the conditions and results are so very different that the same process is not equally applicable. In Belladonna, as in all the foregoing abstracts, the active principles are delicate alkaloids very liable to injury by heat, while in Jalap the active principles are two resins, not very easily injured by heat. Therefore, there is no necessity for wasting the alcohol in this preparation, nor of separating the percolate into two parts, nor of limiting the temperature of the evaporation. The substitute offered here is as follows:

Take of Jalap in No. 60 powder.. 200 parts.
Sugar of Milk in fine powder,
Alcohol, each a sufficient quantity.

Moisten the Jalap with 100 parts of alcohol and allow it to stand closely covered for 24 hours. Then pack it firmly in a cylindrical percolator, and having saturated it with alcohol, allow it to stand 48 hours. Then percolate to exhaustion. Distill off the alcohol from the percolate, and evaporate the residue in a tared capsule on a water bath with continued stirring until a thread of the extract drawn out by the stirrer is brittle on cooling. Then weigh the extract, and for each 36 parts add to it 64 parts of Sugar of Milk. Warm them on a water bath, and having stirred them until thoroughly mixed, cool the mixture, weigh it, add Sugar of Milk sufficient to make the whole weigh 100 parts, rub it to powder, sifting through a No. 60 sieve.

Preserve the powder in a well-stopped bottle.

This is by far the most important of all the Abstracts, because with the exception of the Resin it is the only officinal preparation of Jalap (the compound powder of Jalap being a mixture from the powdered root). The old officinal extract has at last been most wisely dropped by this committee, because, consisting as it did when well made from good jalap, of about 1 part of alcoholic extract to 2 parts of watery extract, and the watery extract having long been shown to be entirely inert, it was but a feeble representative of jalap at best, while it was far from being uniform, and was very difficult to keep in powder in warm weather or in a warm room.

The old formula and process has stood its ground against much opposition since the revision of 1850. About that time, in order to make it practically uniform, the writer made a model trial by the officinal process and found that Jalap of good officinal quality yielded to the officinal alcohol of s. g. ·835, about 20 p. c. of its weight of alcoholic extract, and about 40 p. c. of watery extract. These, when mixed, dried and powdered, gave a powder weighing 57 to 60 p. c. of the jalap. Ever after this, and now for more than twenty-five years the writer has made the alcoholic and watery extracts separately, and mixed them in the proportion of one to two, this being the only way to obtain a uniform preparation independent of the quality of the jalap. This drug, even when selected with the greatest care from a market always well supplied, is very variable in the amount of active principle or resin which it contains,—far too variable for any accurate medication by it. But as the variation is very closely indicated by the amount of alcoholic extract yielded, the extract and resin become very important preparations, and the only important ones, and are all that are needed in medicine.

In a table kept with some care since 1865 the writer has a record of the exhaustion of 7,973 lbs. of powdered jalap. The processes varied in the amount exhausted at one time from about 100 to 1,000 lbs., but were generally from 200 to 250 lbs. The percentage of alcoholic extract obtained varied from 10.7 p. c. to 26 p. c., and the total average from the thirty-four operations in seventeen years is just about 18 p. c.

There were eleven processes which yielded less than 15 p. c., and eleven which yielded 20 p. c. or over, while eight processes yielded respectively about 22, 22.1, 22.3, 22.9, 24.9, 25.2, 25.5 and 26 p. c. The yield falls into time groups, which represent the conditions of the market, since the best that was accessible was always selected. From 1865 to 1871 nine operations in the six years gave 14.4 to 26 p. c. as the extremes, or an average of 19 p. c. From 1872 to 1877 sixteen operations in the five years gave 10.7 and 19 p. c. as the extremes, or an average of 13.7 p. c. From 1877 to 1882 inclusive nine operations representing 4,078 lbs., or more than one-half of the total powder of the table, in six years, gave 18.1 and 25.5 p. c. as the extremes, or an average of 22 p. c. The first eleven years together gave from nearly 3,900 lbs. of powder an average of 15.6 p. c. The last six years from 4,078 lbs., 22 p. c. During the middle period of this time there were one or more patent medicines made in this country, the bases of which were understood to be the alcoholic extract of jalap; and many lots of jalap were met with in the market, which had been extracted before importation to a greater or less degree, so that for a time it was difficult or perhaps even impossible to get jalap that had not been washed with alcohol and the resinous part abstracted to some extent. The evidences of such washing will be noticed under the title, Jalap. The nostrums had their day and died out, and for this or some other reason better jalap has since been accessible in the market. This condition of the drug shows conclusively two important facts: first, that the strength of good jalap is very variable; and second, that the yield of alcoholic extract is a good practical indication of its variability and its value. Of course the proportion of resin, as adopted by the present committee, is a much better indication of the quality of the drug, but the resin bears a moderately close relation to the alcoholic extract of about 12 to 20, and in this revision of 1880, for the first time, the quality of the drug is practically controlled by a competent test.

It has now been shown that the old officinal Extract of Jalap of 1870, when made uniform by a model process, represented good jalap in the proportion of 60 p. c., or 6 parts to 10 of jalap, or 6 grains of powdered extract representing 10 grains of jalap; and that 40 p. c., or 4 parts or 4 grains of this was not only inert, but was very objectionable, because it rendered the preparation very liable to run together or to clog by a very moderate degree of warmth. This has been very wisely dropped, and has been substituted by the present officinal Abstract, which represents good jalap in the proportion of 50 p. c., or 5 parts to 10 of jalap, or 5 grains to 10, and 2½ grains of the 5 are Sugar of Milk. This Abstract is, therefore, 10 p. c. stronger than the old Extract, which it replaces, and so far is a step in the right direction. It is really a similar though better preparation, but under a new name, and increased in strength by 10 p. c.

The old preparation was, however, much too feeble, and in this respect the new is but little better, and why the alcoholic extract was not introduced instead of this Abstract is not known. For some years past it has been well known and has been gradually finding its way into use, so that of late there is a considerable demand for it. It is very uniform in medicinal strength, and uniformly represents a good quality of the drug in the proportion of 1 to 5, or 1 grain of alcoholic extract to 5 of powdered jalap. It is easily rubbed into powder as wanted, though unmixed with other powders it in summer time will not long remain in powder. What proportion sugar of milk would be sufficient to keep it in the condition of a permanent powder is not now known, but doubtless a very much smaller proportion than that present in the Abstract would effect this purpose.

This alcoholic extract is made as the first step of the process given above as a useful substitute for the first step of the process for the officinal Abstract, and if the extract be kept in this condition of a solid, friable, resinous substance, ready for any use, the Abstract or any other dilution may be made from it at any time. To make the new officinal Abstract from this extract, it is only necessary to rub up,—or to melt together and rub up,—10 parts of the extract with 15 parts of powdered sugar of milk.

This extract, to which the writer will adhere in his practice, will be very much improved by the use of the new officinal alcohol (s. g. ·820), since with this it will contain less gummy matter, and, therefore, will make a better powder, while it will be at least 2 p. c. stronger, representing the jalap in the proportion of 1 to 5.5, or perhaps even 1 to 6.

The old Extracts of Jalap,—with the single exception of the Alcoholic Extract of Nux Vomica,—were far more frequently as well as more largely used than any other extracts with which the writer has any knowledge or experience. Indeed, with the above mentioned exception, they were perhaps more largely used than all other extracts together, for there are few substances in the materia medica which have stood their ground better or with less advertising than jalap, for the reason that there are few of such general utility with smaller liability to abuse. It is a hydragogue cathartic, and although in such general and large use, it is rarely given alone. Hence this Abstract or the alcoholic extract present a very useful form in which it may be combined in administration. The dose of officinal Jalap, alone, to give a full hydragogue effect, would be about 15 to 18 grains, but uncombined and in such quantity it would prove irritating. The equivalent full dose of this Abstract would be 7 to 9 grains, or of the alcoholic extract, 2.5 to 3.5 grains. But in the combination into which it enters with most advantage, the Compound Cathartic Pill, for example, it enters in the proportion of 1 grain of the Abstract, or say one-third of a grain of the alcoholic extract in each pill.

It is highly probable that the older extracts enter into most of the effective purgative nostrums of the day, and into a great many of the house formulas of hospitals and dispensaries, and it seems rather unfortunate that in consulting the index of the Pharmacopœia now no extract of jalap will be found in the long list of Extracts where it has been so long, nor any intimation anywhere in the book, that a better preparation, which is nearly equivalent to the old officinal extract, is substituted under this new name of Abstract.

On page 444 it is found that Extract of Jalap is dismissed, when in reality and in effect the process is improved under a new name. Then, in looking at the " List of Changes of Officinal Latin Titles," at page 447, no notice is found, although in effect it is really and substantially a change from Extractum Jalapæ of the Pharmacopœia of 1870, to Abstractum Jalapæ of the Pharmacopœia of 1880. All these points being known and recognized, little inconvenience can arise, but it is feared that they are not generally known.

ABSTRACTUM NUCIS VOMICÆ.

ABSTRACT OF NUX VOMICA

Nux Vomica, in No. 60 powder, *two hundred parts*..................	200
Sugar of Milk, recently dried and in fine powder,	
Alcohol,	
Water, each, *a sufficient quantity.*	
To make *one hundred parts*..................	100

Mix Alcohol and Water in the proportion of *eight* (8) *parts* of Alcohol to *one part* of Water, and, having moistened the Nux Vomica with *one hundred* (100) *parts* of the menstruum, pack firmly in a cylindrical percolator; then add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, until the Nux Vomica is exhausted. Reserve the first *one hundred and seventy* (170) *parts* of the percolate, distill off the Alcohol from the remainder, and mix the residue with the reserved portion. Place the mixture in an evaporating dish, and, having added *fifty* (50) *parts* of Sugar of Milk, cover it with a piece of thin muslin gauze, and set aside in a warm place, where the temperature will not rise above 50° C. (122° F.), until the mixture is dry. Lastly, having added enough Sugar of Milk to make the mixture weigh *one hundred* (100) *parts*, reduce it to a fine uniform powder.

Preserve the powder in a well-stopped bottle.—*U. S. P.*, 1880.

There is no way known to the writer short of steaming and pulping and drying nux vomica whereby it can be got into a powder that will pass through a No. 60 sieve, and it has always been so uncertain whether the pulping and subsequent drying on steam plates did or did not hurt the drug, that the writer never adopted this method of getting it into powder, but was always best satisfied to crush it and grind it without heat, although this makes a coarse, unsightly, fuzzy powder, which will not at all pass through a No. 40 sieve. But such a powder is fine enough for successful percolation and exhaustion, and is therefore all that is necessary.

In this preparation, in the Extract, Fluid Extract and Tincture exactly the same menstruum and the same process of exhaustion are given, and all use a menstruum of 8 parts alcohol to 1 part water. This menstruum has a strength of about 80 p. c., and is about 5 p. c. weaker than that used in the Revision of 1870.

This 85 p. c. Alcohol of 1870 was thought by the writer and others to be too weak for making the Extract, but perhaps stronger than necessary for the liquid preparations, and therefore a 91 p. c. menstruum, or the present officinal Alcohol was adopted and has long been successfully used for both Extract and Fluid Extract. The writer believes, however, that a discrimination should be made, and that the officinal 91 p. c. Alcohol should be used for this Abstract, and for the Extract, and the weaker menstruum, or perhaps a weaker one still, should be used for the Fluid Extract and Tincture.

With the exception of the name of the drug and the strength of the menstruum, and that a part of the Alcohol is recovered by distillation, this formula and process are exactly the same as for Abstract of Belladonna, and the substitute process there recommended is equally applicable here for the same reasons, except that this drug is much less liable to injury by heating. A well-made Fluid Extract by repercolation with 91 p. c. Alcohol representing the drug in the old proportion of minim for grain, when evaporated spontaneously on a dinner plate as directed, yields about 5.4 per cent. of extract, 30 c.c.=1 fluidounce, giving about 26.2 grains of very light colored extract. This requires about 213.8 grains ot Sugar of Milk to make the officinal proportion of 15.55 grammes=240 grains of Abstract. This proportion is so very large that the resulting Abstract is a dingy or yellowish-white powder, and does not clog at all. But it only represents the nux vomica in the proportion of 1 to 2, where it might have been easily made to represent it in the proportion of 1 to 8. But of what use this Abstract is to be in the presence of the officinal Extract, which, if properly made, fully represents the drug in the proportion of about 1 to 12, the writer cannot see, especially as the better Extract can be easily and safely made so as to rub into a powder. The demand for an extract of nux vomica ot pilular consistence has very nearly ceased in the experience of this writer, and the demand for a powdered extract will not be likely to be satisfied by this Abstract of a strength of 1 to 2, when a powdered extract of the strength of 1 to 12 has long been supplied at a very much smaller proportionate cost, and very much greater practical convenience.

The dose of good Nux Vomica is from 2 to 3 grains, and therefore the dose of this Abstract would be half that amount for the same uses, while the equivalent dose of the powdered extract would be about one-sixth that of the Abstract. The Abstract is too bitter to be well administered in any other way than in a capsule or in a pill; and if so given, it has no advantage over the powdered extract, nor indeed over the Fluid Extract, except that this latter preparation partakes more largely of the inequalities in strength of the different lots of the drug from which it is made. The Fluid Extract rubbed up with powdered sugar of milk in the proportion of 2 to 3 minims to 5 grains of the powder, can be about as easily filled into capsules as the Abstract can, and will be as easily administered. Or, capsules half filled with powdered sugar of milk will receive 2 to 3 minims each of Fluid Extract from a minim pipette about as conveniently as they could be filled with equivalent weighed doses of the Abstract. Hence, an Abstract of Nux Vomica appears to have been really least needed of any yet considered.

ABSTRACTUM PODOPHYLLI.

ABSTRACT OF PODOPHYLLUM.

—*U. S. P.*, 1880.

This preparation can certainly be of no practical utility or importance in the presence of an Extract, a Fluid Extract and a Resin, especially when the resin is known to be a perfect representative of the drug, while all other preparations vary with the very variable quality of the root, no test having been adopted for the quality of the root.

It is well known now that the poorer the root the less resin it yields, and that the resin, like that of jalap, is practically the same, whether from rich or poor root, and hence there seems to be no real need or use for any other preparation than the officinal Resin. Then if there be no use for them they are not simply surplussage, but are objectionable from their greater liability to vary in strength with the quality of the drug from which they are made. Indeed, judging from the root as met with in the market, they can be rarely twice alike, and still more rarely of good standard quality.

ABSTRACTUM SENEGÆ.

ABSTRACT OF SENEGA.

—*U. S. P.*, 1880.

This formula and process are, with the exception of the name of the drug, exactly the same as those for Abstract of Belladonna, and the same objections and the same substitute process are equally applicable here. But Senega is not well exhausted with alcohol. Indeed, Proctor states (see Amer. Jour. of Pharmacy for 1860, p. 150) that polygalic acid is the chief active principle of Senega, and that this dissolves in boiling alcohol, but the larger part separates out on cooling. These statements have never been controverted, and the writer believes that no better menstruum has ever been proposed for exhausting Senega than that proposed by Prof. Proctor at the time when he so thoroughly investigated the subject. This consisted of 2 parts alcohol and 1 part water. Such a menstruum has been used for more than twenty years in the writer's practice with good results, and it has now been adopted in this revision of 1880 for the Fluid Extract, and why a different and probably very inferior and more costly menstruum has been ordered here is not comprehended. No good reason can be suggested except that the alcohol rejects the pectin and other gummy matters to a greater degree than the more dilute menstruum, and therefore yields a smaller amount of extract, yet such a reason would have little weight in the committee against the fact that the strong Alcohol is not a good solvent for the active principle.

When the better menstruum of the Fluid Extract is used for the Senega and a good Fluid Extract is made by repercolation in the old proportion of minim for grain, 30 c. c.=1 fluidounce of this, spontaneously evaporated as directed, gave 12.6 grammes=194.6 grains of soft extract, equal to 40.5 p. c. of the root represented. This admitted only 45.4 grains of Sugar of Milk to make the Abstract, and that was insufficient. It was, therefore, necessary to warm this extract with constant stirring until it was reduced as much as possible, and then it admitted enough Sugar of Milk to be pulverizable when cold. It then yielded a light yellowish powder which caked very little on standing, and had the odor and taste of the Senega to a very marked degree.

The Extract of Senega of the revision of 1870 is dismissed. It was a very imperfect preparation, though quite susceptible of improvement, and might easily have been so improved as to dispense with this Abstract. Indeed, the Abstract when well made is only the Extract of 1870 improved, and this is another instance of a title being dismissed or dropped when the improved preparation is present under a new name without any intimation in the Lists of the real character of the change.

Now, however, this Abstract of Senega is one of the most important of the Abstracts, and may prove very useful in the absence of a better extract. The dose of senega to be effective is quite large, and it is quite acrid, producing a lasting disagreeable effect upon the mouth and throat. These have stood very much in the way of its useful application, while its importance as a remedy is very generally acknowledged. Some 12 to 15 grains of the powdered root repeated three or four times a day is about the effective adult dose. The equivalent dose of the Abstract would be of course half that, say six or seven grains, and this quantity can easily be put into one or two capsules, and be thus got into the stomach without the disagreeable acridity of the Fluid Extract or the Syrup.

ABSTRACTUM VALERIANÆ.

ABSTRACT OF VALERIAN.

—*U. S. P.*, 1880.

With only a change of title this is exactly the formula and process of the Abstract of Belladonna, and the same remarks and substitute process are equally applicable here. But the preparation when finished has lost so much of the sensible properties of the valerian with which the process is commenced, that it must be nearly inert and almost useless for the purposes to which valerian is applied. The writer made the preparation with great care, and with all the skill of which he was capable, and yet the resulting preparation was unsatisfactory when compared with the Fluid Extract from which it was made. The 30 c.c.=1 fluidounce of the Fluid Extract on spontaneous evaporation as directed gave 2.88 grammes=44.14 grains of solid extract equal to 9.2 p. c. of the valerian root represented. This required about 196 grains of sugar of milk to make up the 15.55 grammes=240 grains of Abstract, and the result was a very handsome looking powder, but very defective in odor and taste when compared with the Fluid Extract—so much so that it can hardly be doubted that powdered valerian root would, weight for weight, be stronger in medicinal value. It seems, therefore, to be the least successful of all the Abstracts.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. MARCH, 1883. No. 8.

THE NEW YORK STATE MEDICAL SOCIETY AND THE CODE OF ETHICS.

The readers of these pages will need no apology for presenting a more full account of the proceedings in regard to this subject at the late meeting than is found in the published reports.

At the first session of the annual meeting, on Tuesday morning, under the call for resolutions, the following preamble and resolutions were offered with a motion that they be made the special order of business for a special session to be held on that evening at 7:30.

A good supply of these resolutions, with an explanation of the object and effect of defeating them or adopting them one after another, had been printed, and these were placed upon the Secretary's desk for distribution so that each member might understand what the effect of his vote would be on each resolution when presented seriatim for his decision.

These resolutions and this explanation were as follows:

WHEREAS, The Special Committee on the Code of Ethics, in its report at the last annual meeting, recommended a change in one part of the Code which was more in the nature of a revolution than of a revision, and therefore may be more radical than was expected or desired by the constituency of this Society; and

WHEREAS, That report was adopted at a session wherein only fifty-two members voted in the affirmative, and thus legislated for the entire profession of the State on a subject of vital importance in a direction which may not have been anticipated or desired by the profession at large;—therefore,

Be it Resolved, That all the action taken at the annual meeting of 1882, in regard to changing the Code of Ethics, be repealed, leaving the Code to stand as it was before such action was taken.

Resolved, That a new Special Committee of five be nominated by the Nominating Committee of the Society, and be appointed by the Society to review the Code of Ethics, and to report at the annual meeting of 1884 any changes in the Code that may be deemed advisable.

Resolved, That the report of this Committee be discussed at the meeting of 1884, and be then laid over for final action at the meeting of 1885.

Should this preamble and resolutions be defeated as a whole when put to vote, then the action of this year will stand confirmed by the whole profession of the State, and it will be then definitely settled that the old Code of Ethics needed but little change, excepting that consultation with legally registered quacks of all kinds, which were before prohibited, should now be permitted.

If the preamble and resolutions should be admitted, the preamble would be adopted as a mere recital of the facts, and the test vote would be upon the first resolution. If that was defeated it would necessarily defeat all the others, and would be equivalent to rejecting the preamble and resolutions as a whole. But, should the first resolution be carried, it would leave the whole matter exactly where it was before the appointment of the special committee, and then the question would be upon the second resolution. If this should be defeated, the defeat would carry with it the third and dependent resolution, and the effect of this defeat would show that the Society was satisfied with the old Code of Ethics as it has stood for so many years; or at least would show that as yet it was not sufficiently dissatisfied with it to run the risk of making changes at present which might prove hurtful rather than beneficial.

If, however, the second resolution should be adopted it would raise a new committee having the same precept or duty as the previous special committee. But this new committee would be appointed in a very different way, and in a way very much more in harmony with so important a matter. The Nominating Committee of the Society being made up anew every year by the delegates and permanent members of each of the eight old senatorial districts of the State meeting and selecting one of their number for this important committee, is necessarily a very fair and impartial committee and comes afresh very directly from the constituency of the State Society. If this nominating committee of nine men fresh from all parts of the State should nominate this special committee just as they nominate the officers of the Society, and then if the Society should confirm or modify the special committee so nominated, then the committee would be a far better representative of the will and the wishes of the profession at large than if appointed, as the last one was, by the President of the Society.

Should the first and second resolutions be carried and the third one be defeated, then the Society would proceed at once to a final action on the report of the committee, and should there happen to be only a few members present the important result would be reached through the bias of a two-thirds vote of the few, and the matter would have to be undone, if afterward it did not meet the approval of the many.

But, if the third resolution should be carried, the subject could be discussed as freely as might be desired, and would then go over for a year, thus giving plenty of time for any amount of deliberation and writing, and would come up for final action before a new audience fresh from the total constituency of the

Society. By this course a much larger proportion of the profession could think and act upon it with the chances for a much wiser decision. An effort was made at the last meeting to have the report of that special committee discussed and laid over for a year so as to come up for final action at the next annual meeting, but the motion was summarily defeated, and a final action was taken which careful deliberation does not sustain, and which probably could not have been taken in February next. This precipitate forcing through of an unexpected revolutionary measure by the mere power of six votes in a meeting of seventy votes, representing a constituency of over 3,800, is a kind of legislation always to be deplored, and which by its very precipitancy and urgency is far more likely to be wrong than right. The whole object of these resolutions is to ascertain whether in this particular instance of this kind, the action taken was wrong or right as judged by the profession to which it is thus arbitrarily applied.

The motion was carried and a special session was appointed accordingly for the discussion of the subject.

In receiving communications from county medical societies, four more or less vigorous protests against the action of 1882 were presented from Broome, Monroe, Oswego and Westchester counties, and were referred to the special session for consideration, but neither of these communications received any further attention from the Society either at the special session or at any other time.

A communication from Kings County Medical Society was directed to be presented to the Society by the delegates, but as it was not heard of during the meeting, it may be as well to give a brief history of it in this connection in order to show the small courtesy and consideration the county medical societies received at the hands of the State Society.

A copy of the preamble and resolutions of the Kings County Society were forwarded by the Secretary to the Secretary of the State Society but never reached the body either through the Secretary or through the delegates.

At a regular stated meeting of the Medical Society of the County of Kings, held on Tuesday evening, June 20, 1882 (see "Proceedings" of the Society for July, page 100), the President suggested that some action should be taken in regard to the action of the State Medical Society in the matter of the Code of Ethics, and thereupon the following resolution was adopted:

"*Resolved*, That the question of rejection or adoption of the Code of Ethics by the State Medical Society at its last meeting be considered by this Society at its October meeting."

At the regular stated meeting held October 17, 1882 (see "Proceedings" for November, page 174), the President called for the discussion of the action of the State Society on the Code of Ethics, which had been made a special order of business for this meeting. But a repetition of the notice for this special subject having been accidentally omitted from the notices for this meeting, the discussion was, on motion, postponed until the November meeting. This writer then offered the following preamble and resolutions as a basis for discussion and action at the November meeting, and moved that they be received and published in the "Proceedings," so that every member of the Society might consider them well beforehand so as to be able to discuss them and vote upon them after mature deliberation:

Whereas, It is known through the delegates of this, The Medical Society of the County of Kings, to the Medical Society of the State of New York, that the latter body did, at the annual meeting in February last, first discuss the abrogation of the entire Code of Ethics, and, that proposition having failed, did adopt the report of its Committee on the Code of Ethics, whereby that part of the Code which relates to consultations was not only practically abrogated, but a clause was substituted declaring that "members of The Medical Society of the State of New York, and of the medical societies in affiliation therewith, may meet in consultation legally qualified practitioners of medicine," which is in direct opposition to the former Code and to the Code of the American Medical Association; and

Whereas, This Medical Society of the County of Kings is in affiliation with, and is represented in both the Medical Society of the State of New York and the American Medical Association, it now finds itself with two Codes of Ethics which are in direct opposition upon the important subject of consultations, and with a by-law enforcing the Codes of both these bodies. If this County Society obeys the legislation of the State Society it must give up its affiliation with the National Association; while if it holds to the Code of the National Association, it is subject to be admonished by the State Society for this rejection of its by-law,—therefore, be it

Resolved, That this Society earnestly desires to retain its relations with both the State Society and the National Association, and, if possible, will do nothing to sacrifice its right to representation in either body.

Resolved, That this Society deprecates the principle of the State Society taking revolutionary action upon matters of general and important professional interest without consulting the wishes of its constituent county medical societies directly upon the points to be legislated upon.

Resolved, That this Society regrets the action of the State Society in regard to this clause in the Code of Ethics, and respectfully asks that the action may be reconsidered and reversed at the next annual meeting.

Resolved, That this Society is in favor of having a Code of Ethics, and of having one that may be in substantial accord with the principles of the old code of the State Society and the present code of the American Medical Association.

Resolved, That a copy of this preamble and resolutions be forwarded by the delegations of this Society both to the State Medical Society and the American Medical Association, and that the said delegates be instructed to vote on this subject in the interest of these resolutions, upon whatever issue may arise concerning Codes of Ethics or their abrogation, because these resolutions express the will of a majority in the Society to be represented by said delegates.

These resolutions were accepted, recorded and published fully and freely, so that when they came up for action in November every member of the Society had had five months' notice of the intended action on the subject, and had had the resolutions before him for one month before being called upon to discuss and vote.

At the regular stated meeting, held November 21, 1882, see "Proceedings" for December, page 204, after another repetition of the notice on the card sent to every member of the Society, the resolutions were taken up and discussed separately, and after several amendments and substitutes were offered and lost, and after vigorous discussion at a large meeting, the preamble and resolutions were carried on secret ballot by a vote of 51 yeas to 40 nays.

Two of the substitutes offered and rejected by decided majorities were substantially for having no Code of Ethics at all.

As ample notice had been carefully secured to each member, and free and full discussion had, the inference was a fair one that this had settled the question for this Society.

But at the January meeting, with a much smaller number present (75 against 91), and without any previous notice given, a motion to reconsider the latter part of the last one of the resolutions instructing the delegates, was made, and after an animated discussion was carried, and that part of the resolution commencing with "and that the said delegates be instructed to vote," etc., was rescinded by a vote of 49 to 26.

When the final vote was taken, as also one to lay on the table, the yeas and nays were called for and were recorded, although strongly opposed by a member in the majority, on the ground that it was "cracking the whip" over the heads of members to influence their votes. Thus the original preamble and resolutions remained to be the will of the Society, except that the instructions to delegates were rescinded.

As this movement had come upon many members of the November majority as a surprise, a call for a special meeting for February 1st was issued, with three days' notice, in order to determine, if possible, whether the decision of the November meeting, after ample notice, with 91 members present and voting, or that of the January meeting with 75 members present and voting, was the real mind of the Society. The special meeting was held with 100 members present and voting, and after a free discussion of the subject of sending instructed delegates to the State Society, the decision of the January meeting against instructions to delegates was sustained by a secret ballot of 59 to 41. Early in the discussion, while the principal motion was pending, a motion was made that when the vote was taken it should be by secret ballot, and the mover characterized a vote by yeas and nays as a "gag law" which had been put upon his majority side at the last meeting, and stated that his side of the question had lost the vote of an able and honorable member by the call for recording the yeas and nays, because said member would have voted for the reconsideration by secret ballot, whereas when he found his name and vote were to be recorded he felt obliged to vote against it.

At the January meeting two vacancies in the delegation to the State Society were to be filled for the unexpired term of the delegation, and the election resulted in the choice of one member who had from the first declared himself to be an opponent of all codes of ethics; and this election was claimed as showing that the Society had, with emphasis, changed its mind in regard to instructing delegates, and was now prepared to send a delegate who would certainly, as its delegate, vote in opposition to any code, or at least was free to vote as he pleased. But it was overlooked that the other delegate, elected at the same time, had freely expressed himself and voted against the New Code movement.

On Tuesday evening, when the State Society met in special session, a prearranged motion was made and carried that the Society go into Committee of the Whole House for the discussion of the subject, and the President called Dr. Alexander Hutchins, of Brooklyn, to the chair. The preamble and resolutions were then read from the Secretary's desk, and a motion was made and seconded that when the committee rise it shall report adversely to the passage of the resolutions.

In presenting the subject to the Committee of the Whole this writer then opened the discussion as follows:

"In assuming the grave responsibility of an attempt, by these resolutions, to reverse the action of this Society some explanation is demanded.

It is claimed that the action of the last annual meeting upon the subject of the Code of Ethics is contrary to the plan of organization of the Society, and to the letter and the spirit of self-government by majority rule, and therefore ought to be reversed.

The medical profession of this State is associated and organized under a law of the State, the title of which is, "An Act to Incorporate Medical Societies for the purpose of regulating the practice of Physic and Surgery in this State."

The first section of this law legislates county medical societies into existence and prescribes the mode of their organization, making these the primary bodies for accomplishing the purpose of the law in "regulating the practice of Physic and Surgery in this State," and the source of all power and authority to regulate.

The second section of the law then creates a representative body from these county societies to be called "The Medical Society of the State of New York," for the purpose of associating these county societies together, and establishing a system of majority rule for the self-government of the medical profession.

By authority of this law both the primary and secondary bodies make for themselves subordinate laws or by-laws, and declare that these shall be harmonious.

Then for a basis for such harmonious action throughout the profession of the State a constitution is framed and adopted under the title of "A System of Medical Ethics," and all by-laws are required to conform to this constitution.

Then this constitution, as the result of the law, and the basis of all the by-laws of both the primary and secondary organizations, becomes the ultimate object and agency of the law to effect its "purpose of regulating the practice of Physic and Surgery in this State." In other words, it becomes the supreme law and authority of this State for regulating the profession, and as such it becomes the complete analogue of the State Constitution, which is the basis of all civil law, for the regulation of the practice of county and State government.

Then, whenever such constitution or its analogue needs to be changed or amended, there is one—and only one—way in which such action can be lawfully, justly or equitably taken where the principles of self-government by majority rule are recognized and accepted. The change must originate, as a proposition only, in the secondary or representative body, and when there discussed and formulated it must be submitted to the primary organizations as a proposed amendment to be accepted or rejected by a majority vote at the primary, or ultimate source of all legislative authority and power.

If a Legislature were to amend a State Constitution without first submitting the amendment to the people through their primary local organizations, representative though this Legislature may be, and fresh from this very same people, it would be an unwarrantable usurpation of power and a violation of the fundamental principles of self-government.

Now, what was the action taken at the last annual meeting of this professional legislature which is sought to be reversed by these resolutions?

A committee on the Constitution or Code of Ethics was appointed by the President in 1881 "to consider the whole question of desirable changes in the Code," and to "present to the Society at the session of 1882 such suggestions on this subject as their observations and investigations may direct" (see Transactions for 1881, page 25). That is, the committee was directed to suggest amendments to the Constitution, in conformity to an expressed desire for amendment.

This committee reported, at the annual meeting of 1882 (see Transactions for 1882, page 74), not suggestions, but a substitute for the entire constitution or system of ethics of the profession, and in this substitute a fundamental principle of the original constitution or system which had been ratified by the profession in the primary organizations, and had been in force for more than half a century, was reversed.

Up to this point, although the committee had exceeded its instructions in bringing in a revolutionary substitute instead of "suggestions," the action may be accepted as being legitimate and in lawful order, for the substitute might be accepted as the method by which the committee chose to present suggestions in a form suitable for presentation to the constituency of the State Society,—namely, to the County Societies. But just here the irregular and unlawful action began. The committee pressed the substitute for immediate adoption, and it was adopted, thus revolutionizing the principle on which the practice of the profession of the State had been regulated for more than half a century, without notice to, or consent of the primary constituent organizations of the profession in the County Societies.

If it be said in rebuttal that this action was concluded and could only be effected by the very delegates of these County Societies, and that, therefore, it was a representative action, and if done by their agents then done by themselves, the answer is, that while such representative action is entirely proper, equitable and lawful under all the ordinary circumstances of delegated authority in representative bodies, it becomes revolutionary and hurtful under the extraordinary circumstances of the abrogation or reversal of long established fundamental principles of action, brought up in a sudden and unexpected manner, so that the delegates could not possibly know the minds of their principals upon the issue brought, and, therefore, could not vote on an authority which had never been delegated to them. That is, delegates with full powers upon the general subjects of representative bodies are without any just power to act for their principals on special subjects of a revolutionary character, the issues of which have never come to the knowledge of their principals ; or, in other words, they have no power to make constitutional amendments. And if they do the acts for which they have no power, those acts are unjustifiable and ought to be reversed.

If the above line of argument and explanation be not not sufficient to justify the presentation of these resolutions, then an appeal may be made to the fact that nearly if not quite 40 of the 60 counties of the State have now, during the past year, discussed, voted upon and condemned this action of last year in their corporate and lawful capacities, while a majority of the remaining counties have either taken no action on the subject, or have not published their action.

In offering these three resolutions, which should be separately discussed and acted upon, the mover of them is in favor only of the first one, which simply repeals the action of last year and leaves the old code as it was, because the controversy caused by the action taken is too warm for any probability of mature and deliberate action at present, and because the subject is too important to admit of any mistakes through overheated, hasty, and, therefore, perverted judgment. In a year or two hence, perhaps, action may be again wisely commenced with a view to pruning and simplifying the constitution of the profession, and then the needed reform should embrace the entire profession of the nation by being first submitted to The American Medical Association, because no State should secede from the professional union, nor can do so with success to its moral standing."

At the outset of the discussion the position here taken was simply and broadly denied, and an opposite position was taken that this central organization was the superior body, the County Societies being subordinate to and subject to this body ; that this was no longer a body of delegates, but of permanent members who represented the aggregate profession of the State, and that, as antedating The American Medical Association, it was superior to that body, or at any rate, did not intend to be held back by it from any projected reform to which the National Association did not see fit to agree.

From this point the discussion became general and as free as possible, and was limited exclusively to the main issue in the first resolution. Not one word was said from first to last upon either the second or third resolutions. During the discussion a substitute was offered, simply repealing the new Code, but this was ruled against by the Chair as being a simple restatement of the first resolution in other words. But in reality this was a substitute not simply for the first, but for all the resolutions, and as such ought to have been entertained by the Chair or by the appeal from the decision of the Chair. And probably the reason why it was not entertained on appeal was that it was understood that no vote should be taken in Committee of the Whole where yeas and nays could not be had. In the course of the discussion a paper was presented from members of the N. Y. County Medical Society asking that the action of 1882 be rescinded. This was signed by 102 members, and embraced the names of many of the older and more prominent practitioners of New York city, but it received but little attention, and apparently was without weight, illustrating the probability that then and there votes alone were worthy of consideration.

It was finally moved and carried that the Committee rise and report progress. The President resumed the chair, received the report and then requested Dr. Hutchins to take the chair again.

The previous question was then moved and carried, and the resolutions were ordered by the house to be put to a final vote by recording the ayes and noes. The mover of the resolutions then called for a vote upon them, one at a time in their order, as this was the original intention of them, which had been stated when they were presented, and the basis upon which they had been discussed; that is, only the first one, embracing the main issue, had been discussed at all, and must be decided before the others could be logically considered, and the whole three could not be clearly and intelligently voted on together. This putting the main question separately, or voting upon the resolutions separately, was at once objected to, and the Chair sustained the objection, stating that the strict parliamentary effect of moving the previous question was that the vote must be taken on the whole of the resolutions together, irrespective of whether they were confusing or were at variance or not, and that the house, in carrying the motion for the previous question, had committed itself to vote on them all together.

Thus defeated by a parliamentary technicality on the plain and fully stated intention on introducing the resolutions, the mover of them called for a division of the question, in accordance with the 15th Rule of Order of the By-Laws, which is: "If the question in debate contains several points, any member may have the same divided in voting concerning it." This call for division of the question was also objected to and sustained by the Chair, on the ground that a call for the previous question sustained or ordered by the house took precedence of all by-laws, and all other action of every kind. Thus the objectors, by skillfully used parliamentary tactics, were able to defeat a vote upon the single simple issue really involved, and which had alone been discussed, and to force the vote upon a confused issue embracing substitute and supplementary issues never intended to be brought until after the main issue should be decided, and which every one knew were offered in entire fairness and with no view to confusing or obstructing the principal issue. The vote on all the resolutions together was then called, and resulted in 99 ayes to 105 noes; and this leads directly to the inference that in a closely contested issue, unless the leaders are equal in knowledge of parliamentary tactics and in skill in taking advantage of them, the issue may be confused and obscured, and therefore be liable to be wrongly decided. In this instance a majority might possibly have been secured for the first resolution under different and better leadership, but if so, it would have been of no avail, since a majority of two-thirds was necessary to reverse the action of 1882, and such a majority was doubtless impossible in that assembly, so that the defeat was very definite and conclusive.

Immediately after the announcement of the vote, the successful side of the question stated that this was only a provisional and temporary settlement of the question, and that next year the question would be brought upon the entire abolition of this new code and of all codes, and of this movement due notice was given, and a declaratory preamble and resolution were read and offered to lie over for action at the annual meeting of 1884.

On the other side of the question an amendment to the by-laws was offered, and lies over for action in 1884, the effect of which is to repeal the action taken in 1882 and restore the old code.

Another amendment to the by-laws which also lies over till 1884 is to the effect that the Code of The American Medical Association be substituted for the code adopted in 1882.

In the meantime, the Committee on By-laws offered and carried a resolution the purport of which is that all county societies send their by-laws to the committee in order to see whether they conform to those of this Society and of the State.

So it becomes very evident that this question is still unsettled, and is far from being settled, because on the one hand the victorious party are not satisfied with their victory, but propose to move on to greater victory by the abolition of their present code, and of all restrictions, while the vanquished are dissatisfied principally because their lost cause was a good cause on the side of morality and rectitude, and because it was lost in contravention of the expressed will of a majority of the County Medical Societies, and of the expressed opinion and judgment of nearly the entire profession of the nation outside this State.

In view of these circumstances, it seems proper and useful to publish the detailed list of the ayes and noes on the question, and then to give an analysis of the vote made up with much care and pains to avoid inaccuracy. The following is the official list as obtained from the Secretary of the State Society.

The question being, Shall these resolutions pass? that is, Shall the action of 1882 be rescinded, or, in other words, shall the old Code be restored? therefore, the ayes vote for the old Code, and the noes vote for the new Code. The "Del." is an abbreviation for delegate, and "P. M." for permanent member.

AYES.

John G. Adams..........Del.....N. Y. Academy of Medicine.
Edwin Ames.............Del.....Sherman, Chautauqua Co.
Judson B. Andrews.......P. M....Buffalo, Erie Co.
George W. Avery.......P. M....Norwich, Chenango Co.
W. L. Ayer.............Del.....Owego, Tioga Co.
Alexander Ayres.........P. M....Fort Plain, Montgomery Co.
George M. Baker.........Del.....Brooklyn, Kings Co.
Edwin Barnes...........Del.....Pleasant Plains, Dutchess Co.
F. R. Bentley...........Del.....Cheshire, Ontario Co.
R. B. Bontecou..........P. M....Troy, Rensselaer Co
John C. Boyd............Del.....Monroe, Orange Co.
D. D. Bucklin...........P. M....Lansingburgh, Rensselaer Co.
M. H. Burton............P. M....Troy, Rensselaer Co.
John Byrne.............Del.....Brooklyn, Kings Co.

AYES.

A. M. Campbbell	Del.	Mt. Vernon, Westchester Co.
J. C. Casey	P. M.	Mohawk, Herkimer Co.
William Chace	P. M.	Mayville, Chautauqua Co.
E. N. Chapman	Del.	Brooklyn, Kings Co.
James Chapman	P. M.	Medina, Orleans Co.
C. H. Chubbs	Del.	Palenville, Greene Co.
Thos. B. Collins	Del.	Rochester, Monroe Co.
Geo. W. Cooke	P. M.	Kingston, Ulster Co.
Wm. S. Cooper	P. M.	Troy, Rensselaer Co.
A. J. Dallas	P. M.	Syracuse, Onondaga Co.
H. D. Didama	P. M.	Syracuse, Onondaga Co.
L. C. Dodge	Del.	Rouse's Point, Clinton Co.
C. E. Douglas	Del	Constableville, Lewis Co.
George Douglas	P. M.	Oxford, Chenango Co.
J. C. Edson	Del.	Windsor, Broome Co.
E. D. Ferguson	P. M.	Troy, Rensselaer Co.
S. H. French	P. M.	Amsterdam, Montgomery Co.
T. R. French	Del	Brooklyn, Kings Co.
P. R. Furbeck	P. M.	Gloversville, Fulton Co.
C. C. F. Gay	P. M.	Buffalo, Erie Co.
William Gillis	Del	Fort Covington, Franklin Co.
J. W. S. Gouley	P. M.	New York.
William Govan	P. M.	Stony Point, Rockland Co.
Caleb Green	P. M.	Homer, Cortland Co.
D. Gurnsey	P. M.	Amenia, Dutchess Co.
A. Hasbrouck	Del	Poughkeepsie, Dutchess Co.
H. C. Hendrick	P. M.	McGrawville, Cortland Co.
John H. Hinton	P. M.	New York.
E. E. Houghton	Del	Schenevus, Otsego Co.
B. L. Hovey	P. M.	Rochester, Monroe Co.
D. B. Howard	Del.	Warrensburgh, Warren Co.
F. F. Hoyer	Del.	Tonawanda, Erie Co.
Joseph H. Hunt	Del	Brooklyn, KingsCo.
Joseph C. Hutchison	P. M.	Brooklyn, Kings Co.
Frederick Hyde	P. M.	Cortland, Cortland Co.
A. P. Jackson	Del.	Batavia, Genesee Co.
Charles Jewett	Del.	Brooklyn, Kings Co.
H. O. Jewett	Del.	Auburn, Cayuga Co.
Thomas M. Johnson	Del.	Buffalo, Erie Ce.
J. K. Leaning	P. M.	Fly Creek, Otsego Co.

AYES.

Elias Lester	Del	Seneca Falls, Seneca Co.
A. J. Long	P. M	Whitehall, Washington Co.
E. M. Lyon	P. M	Plattsburgh, Clinton Co.
J. W. Moore	Del	Cohoes, Albany Co.
J. C. Nelson	P. M	Truxton, Cortland Co.
Robert Newman	P. M	New York
C. E. Nichols	P. M	Troy, Rensselaer Co.
S. E. S. H. Nott	Del	Hamburgh, Erie Co.
J. S. O'Hara.	Del	Utica, Oneida Co.
C. N. Palmer	P. M	Lockport, Niagara Co.
H. C. Palmer	Del	Rome, Oneida Co.
W. H. H. Parkhurst	P. M	Frankfort, Herkimer Co.
S. H. Peck	P. M	Ithaca, Tompkins Co.
Wm. T. Plant	Del	Syracuse Medical College.
Abiathar Pollard	P. M	West Port, Essex Co.
Taba B. Reynolds	Del	Saratoga Springs, Saratoga Co.
Thos. F. Rochester	P. M	Buffalo, Erie Co.
H. R. Rogers	Del	Dunkirk, Chautauqua Co.
Zotique Rousseau	Del	Troy, Rensselaer Co.
J. H. Saunders	Del	Belfast, Allegany Co.
B. A. Segur.	P. M	Brooklyn, Kings Co.
George Seymour	Del	Utica, Oneida Co.
W. B. Seymour	P. M	Troy, Rensselaer Co.
John P. Sharer	P. M	Little Falls, Herkimer Co.
S. Sherwell	Del	Brooklyn, Kings Co.
J. O. Slocum	Del	Camillus, Onondaga Co.
Geo. C. Smith	P. M	Rondout, Ulster Co.
M. D. Spencer	Del	Guilford, Chenango Co.
E. R. Squibb	P. M	Brooklyn, Kings Co.
T. H. Squire	P. M	Elmira, Chemung Co.
A. Walter Suiter	Del	Herkimer, Herkimer Co.
Thos. D. Strong	P M	Northfield, Chautauqua Co.
Robert Thompson	Del	Troy, Rensselaer Co.
J. B. Todd	Del	Parish, Oswego Co.
Ely Vandewarker	Del	Syracuse, Onondaga Co.
Wm. F. Webster	Del	Liberty, Sullivan Co.
J. E. West	P. M	Utica, Oneida Co.
Francis V. White	Del	New York Co.
Wm. T. White	P. M	New York.
J. S. Wight	Del	Brooklyn, Kings Co

AYES.

P. M. Wise..............P. M....Willard, Seneca Co.
C. S. Wood..............P. M....New York.
Wm. D. Woodend........Del..... Huntington, Queens Co.
C. C. Wyckoff............P. M.....Buffalo, Erie Co.
R. M. Wyckoff...........P. M.....Brooklyn, Kings Co.
Total Ayes...........99

NOES.

J. Q. Adams........ ....Del.....Carmel, Putnam Co.
C. R. Agnew.............P. M....New York.
W. T. Alexander..........Del.....New York Co.
E. Alllison...............Del.....Wayne, Steuben Co.
Wm. H. Bailey...........P. M....Albany.
M. J. Baker..............Del.....Hornellsville, Steuben Co.
Eugene Beach............P. M....Gloversville, Fulton Co.
W. R. Birdsall............Del.....N. Y. Academy of Medicine.
J. R. Boulware...........P. M....Albany.
F. G. Buckbee...........Del.....Fonda, Montgomery Co.
W. M. Carpenter..........Del.....New York Co.
F. A. Castle..............P. M....New York.
Walter B. Chase..........P. M....Brooklyn.
Wm. H. Craig............P. M....Albany.
H. S. Crandall............P. M....Leonardsville, Madison Co.
W. W. Crandall..........P. M....Andover, Allegany Co.
F. C. Curtis...............Del.....Albany Co.
C. L. Dana...............Del.....New York Co.
F. R. L. Drake............Del.....Med. Fac'ty, N. Y. University
Theodore Dimon..........P. M....Auburn, Cayuga Co.
Louis Elsberg.............P. M....New York
Wm. S. Ely...............P. M....Rochester, Monroe Co.
J. D. Featherstonhaugh....Del.....Cohoes, Albany Co.
L. E. Felton.............P. M....Potsdam, St. Lawrence Co.
George H. Fox...........P. M....New York.
Frank P. Foster..........Del.....New York Co.
Robert M. Fuller ....Del.....New York Co.
John Gerin...............Del.....Auburn, Cayuga Co.
A. G. Gerster............Del.....New York Co.
V. P. Gibney.............Del.....New York Co.
Emil Gruening...........Del.....New York Co.
Alexander Hadden........Del.....New York Co.

NOES.

A. D. Head	Del	Eaton, Madison Co.
C. R. Heaton	P. M	Owego, Tioga Co.
B. L. Holt	Del	Penn Yan, Yates Co.
H. R. Hopkins	Del	Buffalo, Erie Co.
Joseph W. Howe	Del	New York Co.
Lucien Howe	Del	Buffalo, Erie Co.
Thomas Hun	P. M	Albany.
Jacob Hunt	P. M	Utica, Oneida Co.
James C. Hutchison	P. M	Troy, Rensselaer Co.
Edwin Hutchinson	P. M	Utica, Oneida Co.
A. Jacobi	P. M	New York.
A. M. Jacobus	Del	N. Y. Academy of Medicine.
Harvey Jewett	P. M	Canandaigua, Ontario Co.
Lawrence Johnson	Del	New York Co.
Herman Knapp	P. M	New York.
Charles M. Lefler	Del	Gloversville, Fulton Co.
Joseph Lewi	P. M	Albany.
Daniel Lewis	Del	New York Co.
David Little	P. M	Rochester, Monroe Co.
James L. Little	P. M	New York.
A. V. B. Lockrow	Del	New York Co.
Frank S. Low	P. M	Pulaski, Oswego Co.
Henry March	P. M	Albany
LeRoy McLean	P. M	Troy, Rensselaer Co.
Austin Mandeville	Del	Rochester, Monroe Co.
Arthur Matthewson	P. M	Brooklyn.
Wm. F. Mittendorf	Del	New York Co.
Joseph Moffatt	Del	Washingtonville, Orange Co.
J. S. Mosher	P. M	Albany.
Paul F. Munde	Del	New York Co.
C. A. Nicholson	P. M	Beekman, Dutchess Co.
D. Pardee	P. M	Fulton, Oswego Co.
Edw. L. Partridge	Del	New York Co.
R. W. Pease	P. M	Syracuse, Onondaga Co.
Maurice Perkins	Del	Schenectady Co.
H. G. Piffard	P. M	New York.
L. C. Pilcher	Del	Brooklyn, Kings Co.
O. D. Pomeroy	Del	New York Co.
T. R. Pooley	P. M	New York.
C. H. Porter	P. M	Albany.

NOES.

W. W. Porter	P. M.	Geddis, Onondaga Co.
J. D. Potter	Del.	Delphi, Onondaga Co.
J. S. Prout	P. M.	Brooklyn, Kings Co.
P. V. S. Pruyn	P. M.	Kinderhook, Columbia Co.
J. H. Ripley	Del.	New York Co.
D. B. St. John Roosa	P. M.	New York.
John O. Roe	P. M.	Rochester, Monroe Co.
S. Schoonmaker	Del.	Rondout, Ulster Co.
Abm. S. Seeber	Del.	Milford, Otsego Co.
Samuel Sexton	Del.	New York Co.
Wm. F. Sheehan	Del.	Rochester, Monroe Co.
B. F. Sherman	P. M.	Ogdensburgh, St. Lawrence Co.
George F. Shrady	P. M.	New York.
Andrew H. Smith	Del.	New York Co.
Wm. Manlius Smith	P. M.	Syracuse, Onondaga Co.
Norman L. Snow	P. M.	Albany.
James D. Spencer	Del.	Watertown, Jefferson Co.
C. L. Stiles	P. M.	Owego, Tioga Co.
E. V. Stoddard	P. M.	Rochester, Monroe Co.
F. R. Sturgis	P. M.	New York.
R. K. Tuthill	P. M.	Poughkeepsie, Dutchess Co.
S. O. Vander Poel	P. M.	New York.
A. Vanderveer	P. M.	Albany.
Sol. Van Etten	P. M.	Port Jervis, Orange Co.
E. Van Slyke	Del.	Albany.
S. B. Ward	Del.	Albany Medical College.
David Webster	Del.	New York Co.
B. F. Westbrook	Del.	Brooklyn, Kings Co.
Wm. C. Wey	P. M.	Elmira, Chemung Co.
J. H. Wheeler	P. M.	Athens, Greene Co.
H. R. Winter	Del.	Phoenicia, Ulster Co.
C. E. Whitbeck	P. M.	Cohoes, Albany Co.
William Woodward	Del.	Big Flats, Chemung Co.
Total Noes	105.	

There is an error in this list of the Secretary. The name of H. O. Jewett, Del., is accredited to Auburn, Cayuga Co., when he is a Delegate from Cortland, Cortland Co. This error is corrected in the table which follows, but not in the list.

Two votes are recorded as permanent members whose names are not on the Society's roll, but doubtless they are members who had failed to pay their dues until this meeting. One other vote is not found on the roll of 1882, but is on the roll of 1881. This was an accidental omission. A fourth vote is of a permanent member on the retired list, and as these have no right to vote without paying up back dues, this must have been done.

A simple inspection of the above lists will not only show who are ranged upon each side of this important issue, but will enable any reader to judge of the loose statements which have been, are now, and will be circulated in regard to the moral as well as the professional bearings of the question.

The table on the opposite page is made up from the rolls of the Society as given in the Transactions for 1882, as far as the total number of delegates and permanent members are concerned, and from the above list as far as the votes are concerned, and these three sections of the table are believed to be practically correct and accurate. The fourth section, based on the previous action of the County Medical Societies, is based upon reports as found in the medical journals during the past year, and from reports by letter and by hearsay, and therefore, is probably only approximately correct, but it is entirely sufficient to illustrate the controversy upon instructions to delegates in representative bodies, and this is the chief object of the section.

From this table it appears by the first column that 59 of the 60 counties have County Medical Societies entitled to send 128 delegates, and that four other bodies were represented, entitled to send 8 delegates, making a total of 136 delegates.

By the second column it appears that 46 out of the 59 counties were represented by 97 delegates present and voting, and the four other bodies by 6 delegates, making the total number of delegates present 103.

By the third and fourth columns it is shown first that 30 of the 46 counties represented voted aye by delegates, while 3 counties were tied by opposing votes of their delegations, leaving only 13 counties voting no by their delegates. The four other bodies voting by delegates gave 2 ayes and 4 noes, making the total number 32 ayes, 17 noes, and 3 blanks by tying; the aggregate numerical vote by delegates voting as individuals being for the counties 51 ayes to 46 noes, or with the 4 other bodies included, 53 ayes to 50 noes.

By the fifth column it is shown that 52 counties have permanent

TABULAR ANALYSIS OF THE VOTE BY AYES AND NOES.

COUNTIES.	DELEGATES.				PERMANENT MEMBERS.				MAJORITY VOTE.						County Societies which had taken action on the question and published the results.						
	Total number authorized.	Total number present.	Vote.		Total number on roll.	Total number present.	Vote.		By Delegates.		By Permanent Members.		Total majority		Societies by previous action voted.		Action sustained or reversed by their Representatives in the State Society.				Representatives voted.
																	By Delegts		By P.Mem.		
			Aye.	No.			Aye.	No.	Aye.	No.	Aye.	No.	Aye.	No.	Aye.	No.	Aye.	No.	Aye.	No.	
Albany	4	4	1	3	16	11	...	11	...	2	...	11	...	13	...	1	1	...	1	...	S.
Allegany	1	1	1	...	...	1	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...
Broome	1	1	1	...	6	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
*Cattaraugus .	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cayuga	2	1	...	1	3	1	...	1	...	1	...	1	...	2	1	...	...	1	...	1	R.
Chatauqua....	2	2	2	...	2	2	2	...	2	...	2	...	4	...	1	...	1	...	1	...	S.
Chemung.....	1	1	...	1	3	2	1	1	...	1	...	...	...	1	1	...	...	1	...	...	R.
Chenango	1	1	1	...	7	2	2	...	1	...	2	...	3	...	1	...	1	...	1	...	S.
Clinton	1	1	1	...	1	1	1	...	1	...	1	...	2	...	1	...	1	...	1	...	S.
†Columbia....	1	...	...	...	2	1	...	1	...	...	...	1	...	1	1	...	...	...	...	1	R.
Cortland	1	1	1	...	5	4	4	...	1	...	4	...	5	...	1	...	1	...	1	...	S.
*Delaware	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Dutchess	2	2	2	...		3	1	2	2	...	...	1	1	...	1	...	1	...	...	1	Tie
Erie	5	5	3	2	11	4	4	...	1	...	4	...	5	...	1	...	1	...	1	...	S.
Essex.........	1	1	1	...	2	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
Franklin	1	1	1	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Fulton........	1	1	...	1	2	2	1	1	...	1	...	...	...	1	...	...	...	...	...	...	...
Genesee	1	1	1	...	3	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
Greene	1	1	1	...	4	1	...	1	1	...	...	1	...	...	1	...	1	...	...	1	Tie
‡Hamilton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Herkimer	1	1	1	...	4	3	3	...	1	...	3	...	4	...	1	...	1	...	1	...	S.
Jefferson......	2	1	...	1	3	...	...	...	...	1	...	...	...	1	1	...	...	1	...	...	R.
Kings	12	10	8	2	14	7	4	3	6	...	1	...	7	...	1	...	1	...	1	...	S.
Lewis	1	1	1	...	1	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
*Livingston ...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Madison	1	1	...	1	3	1	...	1	...	1	...	1	...	2	...	1	1	...	1	...	S.
Monroe	3	3	1	2	9	5	1	4	...	1	...	3	...	4	1	...	...	1	...	1	R.
Montgomery ..	1	1	...	1	4	2	2	...	...	1	2	...	1	...	1	...	...	1	1	...	Tie
New York....	24	22	1	21	43	18	5	13	...	20	...	8	...	28	...	1	1	...	1	...	S.
Niagara.......	2	1	1	...	1	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Oneida........	3	3	3	...	12	3	1	2	3	...	...	1	2	...	1	...	1	...	...	1	Tie
Onondaga	3	3	2	1	12	5	2	3	1	...	...	1	...	...	1	...	1	...	...	1	Tie
Ontario.......	1	1	1	...	2	1	...	1	1	...	...	1	...	...	1	...	1	...	...	1	Tie
Orange	2	2	1	1	2	1	...	1	...	...	...	1	...	1	1	...	...	...	...	1	R.
Orleans	1	1	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Oswego.......	2	1	1	...	3	2	...	2	1	...	...	2	...	1	1	...	1	...	...	1	Tie
Otsego........	2	2	1	1	5	1	1	...	...	...	1	...	1	...	...	...	...	...	...	...	...
Putnam.......	1	1	...	1	...	...	...	...	...	1	...	...	...	1	1	...	...	1	...	...	R.
Queens........	2	1	1	...	4	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Rensselaer....	3	2	2	...	11	9	7	2	2	...	5	...	7	...	1	...	1	...	1	...	S.
*Richmond ...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
†Rockland..	1	...	...	...	3	1	1	...	...	...	1	...	1	...	1	...	1	...	...	...	S.
†St Lawrence	3	...	...	...	4	2	...	2	...	...	...	2	...	2	...	...	...	...	...	...	...
Saratoga	2	1	1	...	2	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Schenectady ..	1	1	...	1	1	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...
*Schoharie....	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
*Schuyler.....	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seneca.	1	1	1	...	1	1	1	...	1	...	1	...	2	...	1	...	1	...	1	...	S.
Steuben.......	2	2	...	2	5	...	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...
*Suffolk.......	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sullivan	1	1	1	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Tioga.........	1	1	1	...	2	2	...	2	1	...	...	2	...	1	...	...	...	...	...	...	...
Tompkins	1	1	1	...	1	...	...	...	1	...	...	1	...	...	...	1	...	1	...	...	R.
Ulster	3	2	...	2	5	2	2	...	...	2	2	...	...	...	...	...	...	...	...	...	...
Warren	1	1	1	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
Washington ..	2	1	1	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
*Wayne.......	2	...	...	...	4	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Westchester..	3	1	1	...	6	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	S.
*Wyoming....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yates.........	1	1	...	1	3	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	S.
	128	97	51	46	255	101	46	55	41	36	29	39	57	62	...	...	...	...	...	...	
Albany M. Col.	1	1	...	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	
Syracuse do.	1	1	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	
N.Y. Univers'y	1	1	...	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	
" Acad. Med.	5	3	1	2	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	
	136	103	53	50	...	...	...	...	42	39	...	...	58	65	...	...	...	...	...	...	

S. To Sustain. R. To Reverse.

* Not represented. † Represented by P. M. ‡ No County Society.

members on the roll, aggregating 255 in number; and the sixth column shows that 31 of these counties had 101 permanent members present and voting. Columns seven and eight show that 13 of these counties voted aye, 16 voted no, and 2 were tied by opposing votes; the aggregate individual vote being 46 ayes to 55 noes.

The third section of the table shows the majority vote, which by counties, taking delegates and permanent members together, gives 26 ayes to 16 noes, or over a two-thirds majority; the vote by individual county majorities being 57 ayes to 64 noes.

The fourth section of the table shows the relation between the action taken in the county societies as far as published, and the action of the representatives of these same counties in the State Society. The first column of this section shows that 37 of the 59 county societies had taken such action on the issue as would make them vote aye on the resolutions, and give them the right to expect that their representatives would vote aye.

The second column of this section shows only 5 counties as heard from as voting no. But there are doubtless 3 or 4 others which have taken definite action on this side of the issue.

The object of the section is, however, to see how far the action of the societies heard from, has been sustained or reversed by the votes of their representatives in the State Society.

Of the 59 County Societies, then, 42 at least are known to have ranged themselves on one side or the other of this issue; 37 have taken positions equivalent to voting aye, and 5 equivalent to voting no, on these resolutions. Of the 42 societies, 35 were represented by délegates at this meeting. The delegates of 29 societies sustained the action of their societies, and those of 6 societies reversed the action of their constituent bodies.

Of the 42 societies, 22 were present and voting by permanent member representation. The permanent members from 12 of these societies sustained the action of their societies, and from 10 they reversed the action of their societies.

Taking the delegates and permanent members together in a majority county vote, the total representatives of 23 counties sustained the action of their societies. Those of 8 counties reversed the action of their societies, while those of 7 counties gave tie votes.

This shows that in many instances the delegates having practically no Code of Ethics felt at liberty to defeat the majority in the societies represented, or misrepresented, by them. Under such a system the question of how primary organizations can possibly be represented in secondary representative organizations in the absence of a Code of Ethics seems to be an unsolved problem in the representative form of self-government by majority rule. In one known instance a delegate voted against his individual convictions in order to support the majority vote of the Society which sent him. And in another instance the delegate as deliberately voted against the majority in the Society which sent him, and, therefore, defeated that majority, and each of these delegates represented a county.

It can hardly fail to interest any one who looks over this table to see the full attendance and solid voting of Albany and New York counties; and it is equally interesting to see what the result would have been with these two counties left out, or with room in them for the same diversity of opinion shown in other counties. Had the 102 members of the New York County Society who remonstrated against the action of 1882 been present at the meeting when their delegates were elected, they would have met with more respectful attention and would have served their own interest better.

THE PHARMACOPŒIA OF 1880

(Review continued.)

ACACIA.

ACACIA.

[GUM ARABIC.]

A gummy exudation from *Acacia Verek* Guillemin et Perrottet, and from other species of *Acacia* (Nat. Ord., *Leguminosæ Mimoseæ*).

In roundish tears of various sizes, or broken into angular fragments, with a glass-like, sometimes iridescent fracture, opaque from numerous fissures, but transparent and nearly colorless in thin pieces; nearly inodorous; taste insipid, mucilaginous; insoluble in alcohol, but soluble in water, forming a thick mucilaginous liquid.

The aqueous solution shows an acid reaction with test-paper, yields a gelatinous precipitate with solution of subacetate of lead, solution of ferric chloride, or concentrated solution of borate of sodium, and is not colored blue by test-solution of iodine.

Preparation: Mucilago Acaciæ.

Here, for the first time, is found a good concise description of the officinal drug, and some of its prominent characteristic reactions, to which some practical points may be usefully added. Gum Arabic should be regarded as a generic name, while Acacia is a specific name properly applied only to that kind of Gum Arabic used in medicine. The Gum Arabic from which Acacia is selected comes chiefly from Kordofan, down the Nile, in sacks, to Cairo, Alexandria or Trieste. In this original condition it is called Gum Arabic "in sorts," that is, unsorted or unseparated. The fragments are of all shades of color lighter than a very dark amber, and are contaminated with bark, dust, etc. At the three points mentioned the Gum Arabic is picked—women, children and cripples being employed in picking it, and at Trieste especially, the picking constitutes quite a large and important industry. This picking separates the fragments by color and by freedom from adhering bark, etc., into about five grades usually, and these are called technically, in commerce, "first picked," "second picked," "third picked," and so on, and these grades are then fitted for their special uses chiefly in the arts for "sizes" and "bodies" and in confectionery. The first and second picked are very nearly colorless, and only differ in color by a shade or two, but the second picked is not so free from adhering specks of bark. The first three or four of these grades come into the markets in cases containing about 136 kilogrammes or 300 pounds each. The other grades come in bags. Of these grades the first picked only should constitute the Acacia of the Pharmacopœias, and to this grade only does the name Acacia and the above officinal description properly belong. It is, therefore, not "Gum Arabic," but is "Acacia," selected by picking as the best and purest part of Gum Arabic. It is true, however, that this grade is rarely bought for medicinal uses, the second and third picked, which are considerably cheaper, being generally used. If not seen together, few buyers can distinguish between "first picked" and "second picked," so that sellers by keeping the "first picked" out of their assortment are easily able to sell second for first, and so on down.

Other varieties of Gum Arabic come down the Nile which are well known in commerce, but the sources of which are not well determined. They are not distinguishable in appearance from the gum just mentioned, and go through all the process of picking exactly as do the other gums, and they appear in the markets together, and in "first hands," that is, in the pickers' or in the large importers' hands, the cases are seen side by side, but after leaving "first hands" the distinctions between these and true Gum Arabic are commonly lost. These gums are, however, of inferior quality, and are sold at a lower price. A few years ago the difference in price amounted to

20 to 25 p. c., but of late the true Gum Arabic has fallen somewhat in price, and now the difference is hardly greater than 10 p. c. These inferior gums have been variously called "Gum Sennaar," or in the market "Senare," "Ghezireh" and "Gedda," probably from the districts in which they are collected; the latter name being the most common, and now pretty generally applied to the whole class of these inferior gums.

"First picked Arabic" and "First picked Gedda" are often undistinguishable even by experts, unless seen together and closely compared, and hence the cheaper is often substituted for the better and dearer gum, and still more frequently is mixed with it as an adulterant. The chief characteristic of these poorer gums is a sour smell, which, though easily recognized in the "sorts" or in the lower grades, is by no means easy in the first and second picked. Generally, however, by brushing off the surface gum from the top of a case, and plunging the hands down so as to bring up a double handful from near the middle of the case, the sour odor can be detected. But if 10 or 20 p. c. of the Gedda only is mixed with the true gum, it is almost impossible to detect it.

The inferiority of these gums is that they make a thinner and poorer mucilage than the true gum, and a mucilage which changes and sours sooner. The expression in the arts and in confectionery is that it "does not go as far,"—"does not make as fine a stock," and causes loss by spoiling more easily. The inference drawn by the writer from these circumstances is that these gums come from districts which are subjected to showers, or to some form of dampness which is sufficient to start a slight fermentation in the gum itself. This hypothesis is strengthened by the circumstance that a bag of fine gum which accidentally gets wet, soon develops this sour smell, while others of the same lot will have the natural freedom from all smell, or have the very faint, clean, sweet smell.

The uses of Acacia in medicine require it in two forms, namely, in solution and in fine powder. The solution is used in various ways and for many purposes, and is officinal in the forms of a mucilage and a syrup. The mucilage contains 34 p. c. of Acacia, and the syrup about 8 p. c. The solutions do not keep well especially when there is any admixture of Gedda in the Acacia, or when there is the least quantity of old solution left to start the souring of the new, and therefore they should always be freshly made. To make a good solution promptly not only requires some skill, but also requires that the Acacia be in a proper condition. Taking the

Acacia in its officinal condition the solution of the fragments is a very slow process. If it be rubbed up in a mortar enough of it goes into fine powder to make the whole clog together, and then again the process is tedious and troublesome, whilst if fine powder be taken there will be still more difficulty and the loss of more time.

Many years ago the writer made a series of trials to determine the condition best adapted to making easy and rapid solution, and the result was that a granulated acacia in the form of a coarse powder free from any fine powder was all that was needed, and a "Granulated Acacia" has been supplied to the markets ever since, and is now in common use. This is made by coarsely grinding the first picked true Acacia until it all passes through a No. 50 sieve. The finer particles are then all taken out of this coarse powder by careful and thorough use of a No. 80 sieve. This leaves a very uniform, clean, coarse powder, which constitutes the Granulated Acacia. That which passes through the No. 80 sieve is again ground in a finer mill and passed through bolting cloth No. 120, and constitutes the Powdered Acacia, adapted to a different class of uses. The Granulated Acacia is so promptly soluble that it cannot be washed with cold water, as directed by the Pharmacopœia under the head of Mucilage of Acacia, nor is the washing needed, as the mucilage will be opalescent in either case and not very different. It is, however, true of Acacia, as of other drugs, that the grinding does render the solutions more opalescent, because the particles of bark, etc., which are insoluble are ground up very fine, and because the attrition grinds off fine particles of the mill surfaces. From these circumstances it comes that the finer the powder the more opalescent the solutions made from it.

The uses of Acacia in medicine are chiefly as a vehicle, a diluent or a demulcent. It is also, doubtless, an aliment of the very simplest and blandest kind. In all these offices or functions it has many duplicates and substitutes, but yet stands at the head of its class, though its advantages are often overlooked through the popular appetite for novelty and change.

As an adjuvant or corrigent for prescription uses, whether in solutions or in powders, it has no superior and perhaps no equal in covering the taste of disagreeable medicines, or in shielding the mucous surfaces against the sudden effects of acid or irritant substances, and its skillful application to its appropriate uses is too much neglected.

ACETA, OR VINEGARS.

This class of preparations gets its distinctive name and character from the use of diluted acetic acid as a solvent for the active principles of the drugs to be exhausted, and to reject the portions of the drugs which are useless or objectionable, and as a solvent the acid has proved to be an efficient one. Dating from the age of Hippocrates, these aceta and their kindred oxymels have come down to the present day with a record of good service in medicine. But their day is past. Better solvents and preservatives, and better and more accurate management of them, and more precise methods of medication, have for many years past gradually tended to supersede the Aceta, so that now they are but relics of the past.

In the presence of the Fluid Extracts they may be said to be quite useless, and they have gradually come to be so little used that the few which remain do not much encumber the overloaded materia medica.

Their decline has been so gradual that in thirty years the number has remained at four in the U. S. Pharmacopœia, and the present revision still retains these doubtless through a conservative policy, and not from the value of the preparations or from any very considerable use of them. They are, without exception, represented in the Tinctures, and with the exception of opium they are also represented in the Fluid Extracts, and in all they are made without acetic acid. As triplicate preparations which have gradually been superseded, for cause, by a steady progress in medicine, the wisdom of dismissing them would seem no longer doubtful.

They are all now 10 p. c. preparations, and with the exception of opium all are simple, and only the Vinegar of Squill enters into any other preparation. The Vinegars of Lobelia and Sanguinaria are least used of all, and are rarely heard of in modern practice, and never in the records of modern medication. The other two are of more importance and require separate notice.

The Distilled Vinegar, which formerly stood at the head of this class, is now wisely dismissed as an inferior duplicate of the Diluted Acetic Acid, and quite unnecessary in the presence of the latter.

The Acetum or Vinegar of the Primary List of former revisions is dismissed. It was quite useless in medicine, but was an authoritative standard often referred to by Government officers and others for the proper strength and quality of vinegar as a condiment for dietetic uses, and the standard will be missed because it was the only one. Had the definition and tests been improved a little and the article been retained, it would have been very useful, and not much out of place in a book of standards, which must embrace some condiments and dietetics. The old standard for strength was that a fluidounce should be neutralized by not less than 35 grains of bicarbonate of potassium. If the fluidounce be taken as 460 grains, this indicates a strength of about 4.56 p. c. of acetic acid, and this is about the strength for ordinary table vinegar, though it might be stronger with advantage.

ACETUM OPII.

VINEGAR OF OPIUM.

Powdered Opium, *ten parts*	10
Nutmeg, in No. 30 powder, *three parts*	3
Sugar, *twenty parts*	20
Diluted Acetic Acid, *a sufficient quantity.*	
To make *one hundred parts*	100

Macerate the Opium and Nutmeg in *fifty* (50) *parts* of Diluted Acetic Acid for twenty-four hours. Put the mixture into a conical glass percolator and return the percolate until it passes clear. Then gradually pour on Diluted Acetic Acid until *eighty* (80) *parts* of liquid are obtained. In this dissolve the Sugar by agitation, without heat and strain.

This is a somewhat degenerate successor of what was at first known as the Lancaster Black Drop, then the Quaker's Black Drop, and finally simply Black Drop. It originated in Pennsylvania, and from being largely used there, it was admitted to the Pharmacopœia of 1880 with a good working formula. This formula has stood for forty years, except that Saffron was omitted in 1870, and it is now practically the same as in 1870. In this revision of 1880 the proportion of Opium is reduced from about 16.5 p. c. to 10 p. c., but a fair translation of the definition of the strength of the Opium of the two revisions makes the present powder about one-half stronger than that of 1870, and therefore, the 10 p. c. of Opium in this preparation now is not very far below the 16.5 p. c. of the Opium of 1870 in therapeutic value, except that it was possible for the Opium of 1870 to be strictly officinal and still be as strong as it now is, and except for the probability that the Opium in use for several years past was really of an average strength much above the pharmacopœial limits of 1870. From these considerations it is probable that this preparation, though represented as being nearly 40 p. c. weaker in 1880 than in 1870, is really not far from the same strength in both if made from Opiums which differ in strength as far as permissible under their officinal definitions.

This Vinegar of Opium deserves to retain its place because it is still largely used in Philadelphia, but this is probably its chief claim to be officinally recognized. It is almost an exact duplicate of the Wine of Opium, being of the same strength, but with different aromatics—nutmeg in the one, and cinnamon and cloves in the other. But the Deodorized Tincture is a far better preparation than either and of the same strength, and, therefore, it is difficult to understand the real use of either the Vinegar or the Wine of Opium in the presence of the Deodorized Tincture.

Of course it is possible and even probable that in rare instances any one of these preparations might be found therapeutically more acceptable than the others, but this same probability extends to other preparations not admitted to the pharmacopœia, but which may be superior to the Vinegar and the Wine.

There is no doubt whatever that certain combinations of Opium act differently and better than Opium or morphia alone, both in anodyne and hypnotic effect. That is, the Opium may be so guarded by proper corrigents that its beneficent influences may be realized with more or less of its disturbing and hurtful after-effects. This is the object of the aromatics in these preparations, and of other corrigents in other preparations, and is also the object of deodorizing the tincture. A variation of menstruum and of aromatics may therefore probably adapt this Vinegar of Opium to single cases, which would not be so well treated by other preparations, but if so, the cases must be so rare as to be best managed by extemporaneous prescription.

ACETUM SCILLÆ.

VINEGAR OF SQUILL.

Squill, in No. 30 powder, *ten parts*	10
Diluted Acetic Acid, *a sufficient quantity.*	——
To make *one hundred parts*	100

Moisten the powder with *thirty* (30) *parts* of Diluted Acetic Acid, and, after the mixture has ceased to swell, transfer it to a conical glass percolator, pack it carefully, and gradually pour Diluted Acetic Acid upon it until *one hundred* (100) *parts* of filtered liquid are obtained.

Preparation: Syrupus Scillæ.

This preparation is of some importance as the only source for obtaining the officinal Syrup of Squill, but it can hardly be doubted that the latter preparation could have been as well made from the Fluid Extract, or directly from the Squill as the Compound Syrup is made. Then this Vinegar of Squill would have been unnecessary. The present preparation is about 3 p. c. weaker than the old one, and this change was made simply to bring it into a decimal relationship of 10 p. c., and into uniformity in that respect with the other aceta. But as all the others had to be altered to the same or a greater extent, and for no better reasons, and for no therapeutic reasons whatever, the change is of more doubtful utility than if all had been dismissed.

An error in the revision of 1870, which rendered that process impracticable, has been corrected in this one.

The preparation is very rarely used by physicians. It occasionally enters with advantage into cough mixtures, but much less frequently than the Fluid Extract and Syrup.

ACIDUM ACETICUM.

ACETIC ACID.

A liquid composed of 36 per cent. of absolute Acetic Acid [$HC_2H_3O_2$;—60 $HO, C_4H_3O_3$; 60] and 64 per cent. of water.

A clear, colorless liquid, of a distinctly vinegar-like odor, a purely acid taste, and a strongly acid reaction. Sp. gr. 1.048 at 15° C. (59° F.) Miscible in all proportions with water and alcohol, and wholly volatilized by heat. Acetic Acid neutralized with water of Ammonia, is colored deep red by ferric chloride, and decolorized again by strongly acidulating with sulphuric acid.

Acetic Acid should not yield a precipitate with hydrosulphuric acid (lead, copper or tin), or when supersaturated with water of ammonia (iron) or with test-solution of oxalate of ammonium (calcium). When slightly supersaturated with water of ammonia the liquid should not exhibit a blue tint (copper), nor should any residue be left on evaporating this alkaline liquid on the water-bath (other acids and fixed impurities). When supersaturated with solution of potassa, it should not have a smoky odor or taste, and, when diluted with 5 volumes of distilled water, the color caused by the addition of a few drops of test-solution of permanganate of potassium should not be sensibly changed by standing five minutes at the ordinary temperature (abs. of empyreumatic substances). Boiled with an equal volume of sulphuric acid, the liquid should not be darkened (organic impurities). On adding a crystal of ferrous sulphate to a cooled mixture of equal volumes of Acetic and Sulphuric Acids, no brown or reddish brown zone should make its appearance around the crystal (nitric acid). No precipitate should be formed on the addition of a few drops of test-solution of chloride of barium (sulphuric acid), nor by adding to another portion some test-solution of nitrate of silver (hydrochloric acid), nor, after the last-named addition, should the mixture turn dark on being warmed (sulphurous acid).

To neutralize 6.0 Gm. of Acetic Acid should require 36 C.c. of the volumetric solution of soda.

Preparation: Acidum Aceticum Dilutum.

The tests for quality and strength of Acetic Acid are very much extended and improved in this revision and now leave nothing to be desired for the easy recognition of a standard acid. The tests are all simple and easily applied by any one, and here the plan which is original with this Committee of Revision, of naming the substances tested for in parenthesis after each test, is well illustrated. This is an admirable plan and will do more to direct and facilitate the application of tests than any simple proceeding that could have been adopted.

This application of accurate tests is really one of the most important of the functions of a pharmacopœia, inasmuch as it is that which makes it a standard, and no step has ever been taken in any revision which at all compares with this of 1880 in the multiplication of simple, easy and accurate tests,—in giving the methods of application, and the objects for which they are applied. The importance of this improvement cannot be better illustrated than in the case of Acetic Acid, because the condition of the common market in regard to this article is so very loose and bad, both in quality and strength.

"Acetic Acid No. 8" is generally demanded, or commonly sold, whether demanded or not, both in the arts and for medicinal and dietetic purposes. This commercial term "No. 8" has no fixed or definite meaning. Anybody may sell any strength he pleases as "No. 8," and as there are very few who examine the strength of what they buy, while many are very close buyers by price, it happens that competition in price obtains low prices for still lower grades of strength and quality. This writer has frequently tested the acids of this market for many years past and has found the so-called "No. 8" to vary between 22 and 32 p. c. in strength, and quite as much in quality. Therefore, strength alone being taken into account, the seller of a 22 p. c. acid as No. 8" would at 25 p. c. less price make more money on his "No. 8" than the seller of a 30 p. c. acid would, and the first would, in a majority of cases, sell his "No. 8," while it is very easy to see where the real interest of the buyer lies,—namely, in paying the higher price for the stronger article, because the lower strength gets more money for the amount of acid present, and makes a better profit than the seller of the higher strength.

This designation "No. 8" originated, so far as this writer knows and believes, in the British Excise System, where one series of numbers was used for Acetic Acid, and another higher series for Vinegars, the two having no relation to each other. The meaning of No. 8 seems to have been that one part of such Acid by dilution made 8 parts of "No. 15 Vinegar," and No. 15 Vinegar contained about 4 p. c. of Acetic Acid. This would give just 32 p. c. as the proper original strength for No. 8 Acetic Acid, and the same rule would give just 48 p. c. as the strength of No. 12 Acetic Acid, and these are the only two numbers now heard of in this market in connection with Acetic Acid. The No. 8 is very common, but No. 12 is rarely heard of. By some kind of common consent among the better class of dealers, a usage has been established in this class of manufacturers and dealers of making No. 8 Acid to be about as nearly 30 p. c. as the common hydrometers and the rough usage of them by unskilled workmen can get it. Hence, from many of the better sources it is found to vary between, say 26 and 31 p. c., the average being below 30 p. c.; but from a large majority of sources the No. 8 Acid will not average over 25 p. c., and the No. 12 from 38 to 40 p. c. These lower strengths are generally of low quality also, and are commonly used in a rough, inaccurate way in the arts, especially in the arts of dyeing and calico printing. The No. 8 of better quality, such as is used in food, medicine and photography, is of late years sold by one class of dealers as nearly 30 p.c., or s. g. 1.040, as they can get it, and the s. g., but not the percentage, is generally marked on the carboys and on the labels; but the No. 8 of another class of dealers is as nearly 25 p. c. as they can get it, and has a s. g. of 1.034, but neither the percentage nor the s. g. appears on such parcels. Now if a 30 p. c. No. 8 Acid be worth 9 cents per pound as by the price lists, a 25 p. c. No. 8 is only worth 7½ cents, but even in the vigorous competition of underbidding dealers, it would rarely be offered under 8 or 8½ cents, so that the profit on it would be much better than on the No. 8 of 30 p. c., and beside the quality is always better the higher the strength. In ordering Acetic Acid the consumer, or the retail dealer next to the consumer, often uses no designation at all, simply ordering Acetic Acid. Others order Acetic Acid No. 8, and this is the usage of a large mass of druggists and pharmacists. Such orders will never bring an Acid of above 30 p. c., and will often bring it below 25 p. c., when really in a large proportion of the cases a 36 p. c Acid is needed and required. Hence, it is far better, and the only proper and safe way, to order the Acid by percentage strength only, and abandon these arbitrary numbers which really mean nothing and carry no responsibility of any kind. If an order be for 36 p. c. Acetic Acid, or for Acetic Acid U. S. P., which means 36 p. c., or for Acetic Acid 30 p. c., then there is a responsibilty upon the seller, and if the strength be short the acid can be returned. In buying acid the paying for water instead of acid should be avoided. The best 36 and 30 p. c. Acids of the market are generally of about the same price in proportion to strength and quality. That is to say, if 30 p. c. Acid be quoted on the list at 9½ cents, and 36 p. c. Acid or U. S. P. Acid at 12 cents per pound, as they should be, then the price is practically the same for the amount of acid really paid for, the 12 cent strength being about ⅓ cent higher for better quality incident to higher strength, because the concentration always improves the quality with the strength.

The present tests for impurities in Acetic Acid should always be applied before the tests of strength, because the presence of other acids, etc., interfere with all the tests for strength. As a rule it is now easy to get an acid in the markets at a moderate price which will satisfy all the tests, and the only impurities now commonly met with in the better grades are traces of hydrochloric acid, and more or less empyreuma, but deficiency in strength is by no means uncommon, while want of uniformity of strength within two or three p. c. is very common indeed. Hydrochloric acid is immediately detected by solution of nitrate of silver, and when traces only are present to give a faint opalescence, it may be disregarded. Empyreumatic matters are the most common and most important impurities of all the better grades of modern Acetic Acid, and no acid that is not chemically pure is entirely free from empyreuma. Most of the better grades are free enough to prevent the odor from being noticed when the acid is simply smelled, because the sharpness of the acid vapor blunts the sense of smell, so that an acid sensibly free from empyreumatic smell will, when saturated by soda or potassa, give a very decided odor. But even when the saturated acid is nearly or quite free from empyreumatic odor to an ordinary sense of smell, it is still liable to be contaminated with a small proportion of these substances. This being the case, the permanganate test is supplied in order to prevent a reliance upon the sense of smell, which is so different in different persons. The permanganate is, however, a most sensitive test, and as given in the Pharmacopœia is too rigorous and exacting, when the acid tested is required to remain red after standing five minutes, especially when the quantity of the test added is not better defined than by "a few drops" to an indefinite quantity of acid. Permanganate of potassium decomposes the acid itself slowly, even at ordinary temperatures, and is itself reduced and decolorized, so that the writer has never seen a chemically pure acetic acid which in quantity of 1 c.c. in 5 c.c. of distilled water, with 3 drops of decinormal solution of the permanganate, would not be decolorized in from one to two hours, according to temperature and other accidental conditions, and the smallest proportion of this empyreumatic matter shortens the time to a few minutes when only a small quantity of the test solution is used in proportion to the quantity of acid. In the proper application of this test to the officinal acid, 1 c.c of the acid should be mixed with 5 c.c. of distilled water in a clean test tube. This should not be mixed by using the finger to stop the test tube in the usual way, because this will often vitiate the test, but the mixture must be poured from one test tube into another to mix it thoroughly. Then add one drop of the decinormal solution of the permanganate, and again pour back and forth to mix this. Then put the same quantity of the permanganate into 6 c.c. of the same distilled water in another test tube, and stand this beside the first for comparison. It will be found that the first tube has lost half its color within one minute, and in five minutes it will be nearly colorless, or brown when looked at in the axis of the tube. If to the same quantity 2 drops of the permanganate solution be added, the color will not be brown in less than 5 minutes. If 3 drops be added, and no comparison tube be used, an ordinary observer would say at the end of 5 minutes that the color had not changed much, but if a comparison tube be used it will be easily seen that the color is very much changed, and in about 10 minutes it will be brown without a tinge of the red. An acid which will not become fully brown with 3 drops within 10 minutes is a very good acid indeed, and may be considered, as far as empyreuma goes, strictly officinal, and a saturated solution of such an acid will be almost free from odor, while the little odor that it has is not of the disagreeable empyreumatic character. Acetic Acid improves very much by age, and a sample examined for odor, when freshly distilled, would not be recognized three months later, though it would not stand the permanganate test any better.

In testing the strength, specific gravity is a good indication if accurately taken with correct instruments, but the common hydrometer is generally quite inaccurate, and only gives approximate results. A good hydrometer in practiced hands can be read to units of the third decimal place as required by such specific gravities as this, but these conditions are rarely filled, and two persons reading the same hydrometer in the same liquid will vary by one to three units in the third decimal space. Nevertheless, a good specific gravity hydrometer which has been tested by the person who uses it, and has its error known, is a very useful instrument, because it is easily and quickly applied, and its approximations are close enough to be practically very useful. Those with arbitrary scales, such as Baumé, Cartier, Twaddell, etc., should be rejected.

Far the most accurate, the safest and the best apparatus for specific gravity is a good large bottle and thermometer which have been re-examined and readjusted by the person who uses them. These, with a little practice in use, are quite easily applied and accurate. But in the use of the bottle there is a difficulty in regard to the standard to be adopted.

Three standards are in very common use, and there is reason to believe that they are used indiscriminately and without specification. The first and best standard and that now commonly used in Continental Europe, is a given volume of distilled water at its maximum density, namely, at 4° C.=39.2° F. The weight of this volume is adopted as unity and remains constant, and with this constant weight all other solids and liquids are compared. The next standard of comparison, or for the unity of comparison, and that hitherto much used in Great Britain and in this country, is the weight of a given volume of water at 60° F.=15.6° C., this weight as unity remaining constant and all solids and liquids referred to it being reduced to that same temperature. The third method is that of using as the unit of comparison the weight of a volume of water at any stated temperature, the liquid or solid to be compared being at the same temperature. Hence temperature and different rates of expansion for the same temperatures become in different substances the confusing elements in specific gravity determinations. For example, the revision of 1870 gives the strength of its Acetic Acid as 36 p. c., and the s. g. which indicates that strength as 1.047. Turning then to its definition of specific gravity in the "Preliminary Notices," it is found that "When the specific gravity of a substance is mentioned its temperature is assumed to be at 60°."

The revision of 1880 gives for this Acid the same strength of 36 p. c., and gives as the indication of this strength that the s. g. is 1.048 at 15° C.=59° F., but its preliminary notices upon specific gravity and temperature give no more indication of its standard than do those of 1870. At page 421 is given a table of the strength of Acetic Acid by specific gravity by Oudemans, a German authority. This table is also silent in regard to its unity standard, but being of scientific German origin it may be supposed to be based upon water at its maximum density as a constant. Thus the s. g. of the revision of 1870 is quoted from a table by Mohr, and that of 1880 from one by Oudemans, neither table giving its standard and the two disagreeing materially. By actual trial with a very good acid of 36 p. c. by the normal soda determination, the specific gravity taken with a 250 c. c. bottle and good thermometer, both recently verified, and all accurate precautions taken, the s. g. found at 60° F.=15.6° C. compared with water at this temperature was 1.0489. Taking water at its maximum density as the standard for unity, the s. g. found with the Acid at 60° F.=15.6° C. was 1.0481. With this same unity standard and the Acid weighed at 59° F.=15° C., the s. g. was 1.0483.

This latter determination differs from Oudemans' Table by ·0002, a difference which is within the limit of error in the writer's observations.

This shows first that Oudemans' Table is pretty surely based on the unity of water at its maximum density, and that the revision of 1880 has adopted this standard of unity without notification of this change from the revision of 1870, so that all specific gravities are materially disturbed without notice. It also shows that the revision of 1870 and Mohr's Table upon which it was based, gave an erroneous s. g. for this acid no matter which unity standard be adopted, the figures being too low by all the standards. The difference of temperature between the revisions of 1870 and 1880 being 0.6° C.=1° F. is equal to nearly 0.0005 in the s. g. of this acid, and therefore the s. g. of the 1870 revision should have been by its probable standard of water at 60° F. about 1.049 instead of 1.047. Thus we have now for the first time, in the revision of 1880, not only a good and constant standard of unity for specific gravities in general, but also a correct specific gravity for this important Acid.

Water at its maximum density, namely, at 4° C.=39.2° F. being taken as unity, the s. g. of this Acid at 15° C.=59° F. is 1.0483. At 15.6° C.=60° F. it is 1.0478. At 25° C.=77° F. it is 1.0424.

As in this instance it is pretty plain that water at its maximum density is adopted, it may be inferred that it is adopted for the whole revision of 1880, but the change should certainly have been stated.

A much better means of taking the strength, however, is by normal solution of soda, as directed. Weighing 6 grammes of the acid in a test glass, and adding to this two or three drops of solution of phenolphthalein as an indicator, and then dropping into this from a graduated burette the normal soda solution, with stirring, until the liquid turns of a pink color, is the most convenient as well as the most accurate way of determining the strength. But little apparatus is required, and that is of general utility, if not necessity, to all who intelligently and economically handle their materials, and with such apparatus the testing of this and very many other strengths is quickly and easily accomplished.

This volumetric determination is always about 0.1 p. c. too low, because normal acetate of sodium has not a neutral but an alkaline reaction.

For such as have not this apparatus, and are not willing to procure it, a modification of the saturation test of the revision of 1870 may be very useful. Dissolve 100 grains of crystallized bicarbonate of potassium in 800 grains of water in a tared flask, and make up the weight to 1000 grains by adding sufficient water to the solution. Weigh ~~167~~ 60 grains of acetic acid in a flask of not less than 4 fluidounces capacity. Add to this from the flask of potassa solution, little by little, until the effervescence caused by each addition nearly ceases. Then heat the nearly saturated acid to boiling, and while hot add potassa solution until a fragment of red litmus paper dropped into the flask from time to time, turns blue. Then weigh what remains of the potassa solution to ascertain how much has been used. Each 10 grains of solution used is equal to 1 p. c. of monohydrated acetic acid, and therefore 360 grains of the potassa solution will have been used if the acid saturated be of the strength of 36 p. c., as required; or, should less or more have been used, a weaker, or stronger acid would be indicated and its strength be made known.

This saturation test, like that by volumetric solution of soda, gives an indication about 0.1 p. c. too low, and for the same reasons.

ACIDUM ACETICUM DILUTUM.

DILUTED ACETIC ACID.

Acetic Acid, *seventeen parts*	17
Distilled Water, *eighty-three parts*	83
To make *one hundred parts*	100

Mix them.

Diluted Acetic Acid contains six per cent. of absolute Acetic Acid, and has the sp. gr. 1.0083. It corresponds, in properties, to Acetic Acid, and should respond to the same tests of purity.

To neutralize 24 Gm. of Diluted Acetic Acid should require 24 C. c. of the volumetric solution of soda.

This formula affords the first opportunity the writer has had in this review to illustrate some of the advantages of the method, new to the U. S. Pharmacopœia, but well tried in other pharmacopœias, of stating proportions by their relations instead of by arbitrary weights and measures, that is, the method of parts by weight, as well for liquids as for solids. This method has already been criticised adversely from various quarters, but almost entirely upon the basis of inconvenience, and as being a change from the old plan. The confusion and inaccuracy of the old method, the complaints against which for many years caused the change to be made, first abroad and now here—seem to be forgotten now when the simplest and easiest way, and the only easy way of avoiding a difficult revolutionary change has been adopted. If the experience of European pharmacopœias be any indication, this method only needs a little application in practice to demonstrate its convenience, and, therefore, it will probably become as popular here as in Europe, because there are no people more ready to adopt practical improvements than those of this country, and none where slight prejudices and small difficulties sooner disappear, so that here of all nations the fittest of these methods will be sure to survive, and replace the other despite criticism. But premature adverse criticism, or that which is based on the small experience of two or three months in a few hands, still serves to delay and to prejudice a fair trial.

The formula of 1870 for this preparation is: "Take of Acetic Acid, a pint; Distilled Water, seven pints; mix them." This requires a pint graduate measure, which has so broad a surface that even with moderate care in holding it level and in filling, cannot easily be read to within one or two fluidrachms, and to get as close as this, some time, pains and skill are needed. The Acid, therefore, is within one or two fluidrachms of being correct. But the water has to be measured seven times with the same average inaccuracy, while the time and care in measuring is multiplied by seven, and the preparation is only moderately accurate when made. Whether the graduated measure be an accurate one or not does not matter here, because the formula is really one part to seven by measure, so that the same measure being used for each part, it may be too large or too small without affecting the result—one of the advantages of parts by weight. As the common usage of this preparation does not always require a gallon to be made at a time, but oftener requires a two pint furniture bottle to be filled, then a calculation has to be made on the basis of one measure to seven, and one fluidounce of the Acid to seven fluidounces of water is measured, say in an eight ounce graduate measure, with a larger average inaccuracy in proportion as the quantity is smaller. Hence, as will be seen, this is a very favorable example of the old usage, because it is really an example of parts by measure, and is free from the confusion of inaccuracy of measures, and only subject to inaccuracy in measuring.

Now compare this with the method of parts by weight, and no matter whether it be the 2 ounce vial of the physician, the 2 pint-bottle of the pharmacist, or the carboy of the druggist or manufacturer, the process is exactly the same, and no matter whether the operator has troy weights, avoirdupois weights or metric weights the process is the same. The vessel has simply to be tared, and then 17 grains, 17 half-ounces, 17 ounces, 17 pounds or 17 kilogrammes of the Acid is weighed into it, and then 83 grains, 83 half-ounces, 83 ounces, 83 pounds or 83 kilogrammes of water is added, and the preparation is made. The time, care and skill required are less and the result is more accurate.

Temperature, specific gravity of the liquids, contraction on mixing, and all the other disturbing conditions incident to measuring are out of the way in weighing, whilst to this writer, at least, the convenience of weighing is much greater. But the uniformity and accuracy of result overbalance all other considerations in general usage, where accuracy is so desirable as it is in a national standard for medicine and pharmacy. There are, perhaps, few who will not value this step of progress toward increased accuracy in medicine enough to give it a fair trial in practice and a little thoughtful consideration, and if this be conceded argument is unnecessary. Other advantages of the method will be alluded to as the instances which illustrate them are reached.

In making Diluted Acetic Acid care is needed that it be made from an acid of officinal strength. There is reason to believe that it is not uncommonly made from the so-called No. 8 acid, and then it will be so weak as to be unfit for all its uses.

When accurately made from strictly officinal Acid it contains a little more than 6 p. c. of absolute Acetic Acid, and 24 grammes of it require 24.5 c. c. of volumetric Solution of Soda for saturation. The strength is really very nearly 6.2 p. c. And the specific gravity is about 1.009 at 15° C.=59° F., or 1.0086 at 25° C.=77° F., both being compared with water at 4°C.=39.2° F.

This preparation is just the strength that very good vinegar should be, not only for all medicinal uses, but for all family uses as a most wholesome condiment. If 1 part of alcohol be added to about 256 parts of this Diluted Acetic Acid,—that is, about half a fluidounce to the gallon, and the mixture be set aside for a few weeks,—the longer the better,—enough acetic ether is generated to give it the full, clean aroma of fine vinegar, and then for table use it is very far superior to any vinegar made in the ordinary way by fermenting cider, and it is more wholesome because free from the decomposition products of the fermentation of rotten or bad fruit, and free from the animalculæ and other impurities always present in vinegar by fermentation. It may be colored, if desirable, by a little caramel, but is much nicer when colorless. This vinegar has been used for many years in the families of the writer and many friends, and the experience with it for family use is very favorable, while it is very cheap, costing not over 18 to 20c. a gallon. The popular prejudice in favor of cider, malt and wine vinegars, and against vinegar made from good Acetic Acid is a mistake of ignorance which is not unimportant, because the latter is so much more cleanly and wholesome.

The principal officinal uses of Diluted Acetic Acid are in making the Vinegars, and the Solution of Acetate of Ammonia, but it enters as a collateral ingredient into some other preparations.

Of all the acids, whether organic or inorganic, it is perhaps the most acceptable to the palate and the stomach, and skillfully used in prescriptions it does much to improve their taste and acceptability, while it is entirely wholesome and generally beneficial. It is always decomposed in the organism, and its elements are utilized in their secondary or resultant combinations, and not as an acid. Therefore, although taken into organism as an acid, whether free or combined with a base, it does not remain an acid, and is not eliminated as such,—in this differing entirely from the so-called mineral acids, and upon this difference depends most of its uses in medicine. For example, acetate of potassium is commonly used to render the secretions and excretions alkaline when such condition is desirable. This it could not do if it was a fixed salt, and sulphate of potassium does not do this. But the acetate is split and its base becomes available as an alkali, and is eliminated in the excretions in new combinations, while the acetic acid is lost as such. The sulphate, on the other hand, is in large proportion, at least, eliminated as such, the base not being available for alkaline action and for new combinations. Hence it may be fair to say that this acid is digestible, and is digested as an aliment, or as an adjunct to aliments. This is also true of citric, tartaric, malic, and to some extent oxalic acids.

Therapeutically, it is a refreshing stimulant, refrigerant, diuretic and diaphoretic, and its elements are useful if not beneficial in the economy. The older usage of acidulous drinks in fevers has in modern practice been replaced by ice and ice water, but it is doubtful whether the two might not be combined with advantage, and if so, this would probably be the best acid to use, having some chemical and physical advantages over citric acid for such purposes, though the two are very nearly alike in their agreeable taste and in acceptability to the stomach, while both are digested.

ACIDUM ACETICUM GLACIALE.

GLACIAL ACETIC ACID.

$HC_2H_3O_2$; 60.—$HO,C_4H_3O_3$; 60.

Nearly or quite absolute Acetic Acid.

At or below 15° C. (59° F.) a crystalline solid; at higher temperatures a colorless liquid. When liquefied and as near as possible to 15° C. (59° F.) it has the sp. gr. 1.056–1.058. Its properties are similar to those of Acetic Acid, and it is similarly affected by reagents.

To neutralize 3 Gm. Glacial Acetic Acid should require not less than 49.5 C.c. of the volumetric solution of soda (corresponding to at least 99 p. c. of absolute Acetic Acid).

This is a new substance to the Pharmacopœia, and one that was needed, for although not used as such in the materia medica, its uses in pharmacy will be developed by its presence here. The definition and tests are good and sufficient, and when these come to be applied almost all the acids of the market sold under this name will be rejected. The s. g. given is from ·0001 to ·0002 too high.

It is never found absolute, and perhaps rarely above 99 p. c., because when made absolute it attracts moisture from the air so rapidly that in the necessary handling and putting up it is liable to fall off two or three-tenths of a per cent. Therefore it is very properly limited to be not less than 99 p. c., and this strength is obtained with comparative ease, and can always be found in the market at a very moderate price proportioned to strength and purity. Formerly the best acid was imported from Germany, standing about 97 to 98 p. c., and costing $1.00 to $1.25 per pound. This answered the principal test of the German Pharmacopœia,—namely, that it would dissolve Oil of Lemon. But some of the acid made here now considerably exceeds the requirements of the German test, and is sold at about 60 to 65 cents. This acid stands the permanganate test better than the weaker acids, because in concentrating it by any good process it becomes nearly chemically pure. It should therefore stand all the tests of the Pharmacopœia given under the head of the 36 p. c. acid, when most rigorously applied, and should stand the modification of the permanganate test for more than an hour. If a very fastidiously fine and pure 36 p. c. acid be required for any purpose, 1 lb. of this acid diluted with 1¾ lbs. of distilled water, will give 2¾ lbs. of the 36 p. c. acid for about 24 cents per pound, and the resulting acid will be both better and cheaper than the English Beaufoy's Acetic Acid, which is still occasionally imported.

The ordinary so-called "Glacial Acetic Acid" of the markets is not glacial at all, nor anywhere near it, and is always disappointing when applied to any uses where real Glacial Acid is required. But it has been so long on the lists as glacial, and so much of it has been sold under this false name, that it has made for itself uses to which it may be applicable. As frequently examined by the writer during some years past, it is found to vary between 75 and 80 p. c., but is very rarely found above 76 or 77 p. c., and is generally of poor quality, and quoted at a disproportionately high price. It should not be called Glacial Acid of course, and should not be bought under this fiction. It is really "Concentrated Acetic Acid," and should be so called, but now it is a fraudulent deception, quite inexcusable in respectable dealers. An acid of good quality and with a uniform strength of 80 p. c. is easily to be had in the market under the proper name of "Concentrated Acetic Acid," for about 30 cents per pound, but of course there is but little sale for it in the presence of the so-called Glacial Acid at a higher price, although this latter acid is inferior in both quality and strength.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. MAY, 1883. No. 9.

THE DISCUSSION ON MEDICAL ETHICS.

This discussion, so important to the general interests of the medical profession at large, has become so warm in this State that it may be useful to try to temper it a little by giving emphasis by repetition to some of the more dispassionate views of those who look upon us from without, and see us perhaps more nearly as we should see ourselves.

The *Boston Medical and Surgical Journal* of February 15th has an able leading editorial article, which, though widely known through the large circulation of that journal, will certainly do the more good the oftener it is repeated within reasonable limits. The Massachusetts State Medical Society had two able delegates present at the late meeting of the N. Y. State Society, and if they performed the duty of carrying home what they saw and heard, this editorial may possibly have been one of the results, as before that time the journal had been silent on the subject. The editorial is as follows :

THE MEETING OF THE NEW YORK STATE MEDICAL SOCIETY AND ITS CODE OF ETHICS.

The New York State Medical Society, at its recent meeting, confirmed its action of last year with regard to the rejection of the Code of Ethics of the American Medical Association, and by a decisive vote refused to change the Provisional Code which it then adopted ; a code which, under the name of the New York Code, has been generally discussed by the medical press, and almost without exception adversely. It will be remembered that it copies very closely the former Code, except that it encourages freedom in consultations, and makes up for it by being very stringent with regard to advertising, which seems like excusing sins we are inclined to by condemning those we have no mind to. This Code is called a provisional code, because its chief advocates, those who exerted themselves so actively in having it adopted by the Society, have now openly abandoned it, and have introduced an amendment, to be acted upon at the next meeting of the Society, abolishing this Code and substituting simply the formula that the only offences for which a member can be disciplined shall be comprised under the heading of "conduct unbecoming a physician and a gentleman." Inasmuch as the law does not require a physician to be a gentleman, and since the abolition of the National Code of Ethics was chiefly urged because it established a standard above that of the law, and was therefore illegal, we do not see how the authors of this simplified Code can consistently support even this; it would seem that there can be no safe ground for them to occupy short of the abolition of all codes, in cases of disagreement invoking the protection of the courts. To this at last must all medical societies come, which, abandoning their own legitimate field,—the cultivation of medical science, and the promoting of mutual acquaintance and good-fellowship in the profession,—assume to legislate for the government of physicians, and to adopt political methods in their management.

It is apparently an unfortunate circumstance for the New York Society that its annual meetings have been held in Albany at the time when the Legislature is in session; the air being full of politics, the miasm has apparently infected the Society, and its recent sessions show it to be deteriorating from a medical society proper into a medico-political society, imbued with an ambition of becoming the medical Legislature for the Empire State. It is not without significance in this connection that a committee was appointed to secure a room in the new Capitol for the future meetings of the Society.

The fact that the majority of the medical profession in the State of New York and more than two-thirds of the county societies have expressed their disapproval of its action upon the Code of 1882, without influencing the action of the State Society this year, appears to demonstrate that this Society has ceased to be a representative body, and now asserts its right to act as a legal board of control by authority vested in it by its charter from the State. Those most active in the movement which has crippled the usefulness and threatens the existence of the Association are almost entirely from the eastern part of the State, and the county society most distinguished in its advocacy of the measures adopted was the Society of the city of New York, although it is true that a petition signed by some of the oldest and most prominent members of the Society was presented in opposition to its action. It is greatly to be regretted, for the sake of harmony and good feeling and the best interests of the Society, that the temperate and conciliatory course advocated in this petition was not followed. It recommended rescinding the obnoxious amendment which deprived the Society of its representation in the American Medical Association, and urged the sending of delegates to the next meeting of the Association instructed to ask for such modifications of the Code of 1847 as would meet the views of the medical profession generally. But this suggestion was treated with open disrespect by the new Code advocates.

There is one fallacy that should be pointed out which underlies the entire discussion: it is that the law makes the physician, and that the physician is an officer of the law. If this is granted, then the closer our State societies can nestle under the wings of our State Legislatures the better, for only in this way is to be obtained the necessary power to govern such a large body of sanitary police as we find in the American medical profession. But this cannot be granted, because it is not true. A physician in this country is a private citizen; he is recognized by the law, and responsible to it like other citizens, but he is not made a physician by legal enactment, nor is he a State officer, and if he is wise he does not wish special legislation, for experience has shown that whenever the profession has tinkered with the law it has been made to suffer for it in the end. The lesson also is so obvious that he who runs may read, that the more our societies confine themselves to their proper field,—the joint cultivation of medical science and good fellowship,—and the less they meddle with medical politics, the better it will be for their own future and the common good of the profession. Although the question will be again brought up next year in the action upon the several amendments that have been referred, it is hoped that a better sentiment will prevail, and that some course may be determined upon that will harmonize the views of the members, and that will commend itself to the judgment of all. If there is any delegate who persistently interrupts the scientific labors of the Society by engendering disputes and ill feeling and efforts to divide the Society into factions he should be summarily dealt with; if necessary, expelled for being guilty of "conduct unbecoming a physician and a gentleman."

The late meeting of the New York Society shows the effects of these disputes, it being confessedly unusually devoid of medical or scientific interest. The papers themselves represented almost exclusively the specialists of New York, who seem to have had control of the meeting in all its aspects; they were not attentively listened to, and discussion was conspicuous by its absence. The net result is to impress the mind with a sense of the predominance of the commercial over the professional or scientific elements of the practice and pursuit of medicine.

A fairer or more temperate view of the case, or better indications for its consideration and management could hardly be found, but unfortunately in the heat and enthusiasm of controversy there is little chance for temperate counsels. Words of wisdom are too often lost when reason is disturbed by passion, and zeal degenerates into fanaticism.

Such an article with such a tone strongly suggests a review of the conditions which have called for it from a position outside of its field of present activity, but not outside of its general future influence.

Casual indications from private intercourse and after dinner speeches have for several years shown that a very few prominent men of the metropolis have been gathering force and a following for what they have considered a needed reform in medical policy. This drift unopposed acquired strength enough by the time of the annual meeting of the State Society in 1880, to be embodied in a committee of five of the leading advocates of the movement. During 1880 they privately and quietly matured their plans for their reform,—strengthened and concentrated their following, and at the meeting of 1881, surprised the profession at large by the first announcement of their radical and revolutionary measure of supposed reform. Intolerant of opposition, and therefore intemperate in their denunciation of it,—impatient of delay, and therefore precipitate in action, they seized their opportunity and pushed their measure through at their own selected time, taking advantage of ordinary conditions for an extraordinary movement of revolution,—and that revolution of a disturbing and exciting character. The expectation that this radical change or revolution would be quietly acquiesced in was not realized, and as the profession at large awakened to its importance a feeble and unorganized attempt at resistance was made without success, the effort tending mainly to add strength, enthusiasm and more effective organization to the movement, and confidence and boldness to its skillful leaders. Gradually, however, a strength and skill was being developed equal to their own,—organization was begun, leaders of skill and ability were found, and a campaign is begun which promises to be vigorous and effective. This is the legitimate result of such wise and temperate articles as that above given, and it is to be hoped that all the professional journals will give such unequivocal aid and influence as this, until a full and fair chance has been given for an expression of the will of the entire profession on the subject, not only in this State, but in the Nation. A central association has been formed in New York City for the support of the Code of Ethics of the American Medical Association, and the county is being polled to get the vote of every regular physician either for the National Code, the New Code or no Code, and blank votes are also to be taken. Under the auspices and activity of this central association other similar ones have been urged upon every county of the State, so that the whole State may be accurately canvassed in this way and put upon record through competent authority and by active energetic work; and if the work be fully and fairly done the issue will be settled one way or the other.

Another article has appeared recently, which it may be useful to repeat, as it treats of points which have not been discussed in these pages. From the Philadelphia *Medical News* of February 24th, page 231, the following is republished:

THE EXPLANATION OF THE NEW YORK CODE.

To the Editor of The Medical News.

SIR: I assume (perhaps erroneously) that you would not intentionally misrepresent the New York State Medical Society, that you might misconstrue, or be misinformed, but not willingly misrepresent; and therefore send you the thoughts which prevailed in that Society, and determined its action upon the question of the Code of 1882.

The people, through the Acts of 1806, 1857 and 1865, and their various amendments, announce that they now have, and forever reserve to themselves, the right to declare who shall exercise the rights and privileges of physicians in this State.

The Medical Society of the State of New York reaffirms the declaration of the Code of 1882, that the official formula of the official Society of the medical profession should accord with the laws of the State, the will of the people, the law-making power.

The Code of 1882 says that it is unwise for the medical profession of the State of New York to attempt to misstate or misrepresent any portion of the medical law of the State, by which that profession is governed, and therefore does not attempt to deprive members of the profession of 1857 and 1865 of their rights as physicians.

We say that the people have said that those men are physicians, and we say nothing more. We endorse no societies, we endorse no men, no practices, and no doctrines. We simply maintain our right to give our advice whenever and wherever the people want it.

The American Medical Association asks us to make war upon the State of New York, and our Society votes that it has no relish for such an enterprise.

The above were the prevailing sentiments of the recent meeting, and by comparing them with your editorial in *The News* of the 10th inst., you can easily see how fairly you represent the situation.

Sincerely yours,

H. R. HOPKINS.

BUFFALO, Feb. 13, 1883.

[We thank our correspondent for his courtesy in parenthesis, but being still not in his mental attitude on this subject, must risk further charges of misrepresentation. Some new line of argument was needed on his side of this movement, and this one is new. Were the statements upon which it is based, and which are given as facts, somewhat nearer to being facts, the argument would have more force. When the real facts are better considered by our correspondent he may find that his charges of misconstruction apply better to himself.

The Acts of 1806, 1857 and 1865, and their various amendments, were not made by the people, nor at the suggestion of the people, but by the petition of the bodies whose interests they represent, for the regulation and incorporation of these bodies, and for the welfare of the people through the suppression of irregular practice and quackery, and to invoke them now in support of a leveling affiliation is to misconstrue them, because it reverses their original purpose and intent. They are all laws of the people, deriving their powers from the people for the good of the people. But they originated not with the people, but in the bodies they incorporate, and, as they one after the other traverse each other, as far as the good of the people is involved, they are inoperative, excepting, perhaps, the original one, which, though emasculated, was never repealed. This law of 1806, "for the purpose of regulating the practice of Physic and Surgery," incorporated the medical profession of the State "to contribute to the diffusion of true science," and hence it was for the *regular* profession.

The law of 1857 was "To incorporate Homœopathic Medical Societies," and that of 1865 was for the incorporation of Eclectic Medical Societies, and nothing is said in either of these two simple acts of incorporation about the purposes for which they were incorporated, but they are based upon the original law of 1806, and have "All the powers, privileges and immunities now conferred by law upon the State Medical Society" and county medical societies. The purpose, so far as the welfare of the people is concerned, is the same in all three, namely, to suppress irregular practice or quackery through the incorporate existence of "true science." Therefore, as to each one the other two became irregular, or are based on untrue science—that is, quackery—and as each one contradicts the other two, two must be void, for the people cannot enact laws to their own hurt, and the powers granted reside only in the first or original law.

Now, if the Code of 1882 attempts to harmonize these three conflicting laws by bringing into force the two inoperative ones, it is equally objectionable from the standpoint of any one of the three, and its action is impossible from the standpoint of greatest good to the people as the law-making power.. Beside, the people have not said that all "those men are physicians." They have said, in the first law of 1806, that *these* are physicians, and constitute the profession, and are to be regulated for specific purposes as stated; but the others are simply incorporated for purposes not stated, but with the powers and rights of other corporations.

When the advocates of this no-code movement say they endorse no societies, no men, no practices, no doctrines, this can only be true in the sense that by demolishing all differences that have hitherto existed between societies, men, practices and doctrines, they really endorse all. What the progress of truth has differentiated from error they destroy, and substitute a communism ; and this, like all other communistic license, is done in the name of "liberty" and "the people."

The American Medical Association has not asked "us" to make war upon the State of New York, even by implication, for it has asked nothing at all. It is a voluntary association, like all others would soon have to be if official legal existence was permitted to dragoon them into unwholesome and incompatible fellowship, and as a voluntary association it simply declined an incompatible fellowship; therefore, the votes of "no relish" were rather irrelevant.

As the line of argument of our correspondent was not reported from the late meeting of his State Society, we are at a loss to know how he ascertained that it was the prevailing sentiment. We hope he may be mistaken.—ED.]

Another communication republished here from The N. Y. *Medical Record* of April 28, 1883, page 475, adds important weight to the argument upon the legal status of the physician.

This comes from Rensselaer County, which was the first county to officially disavow the New Code and No Code, and to reaffirm its allegiance to the Code of The American Medical Association. It is a curious circumstance that this and the adjoining Albany County,—and especially the cities of Troy and Albany,—are so nearly unanimous upon opposite sides of this issue.

DO THE LAWS OF A STATE DEFINE THE DUTIES OF INDIVIDUALS OR SOCIETIES IN MATTERS OF ETHICS ?

SIR : A noticeable feature of Dr. Agnew's article on the Code question in a recent issue (*vide* p. 349) is that it does not in any way discuss the claims to recognition of the class or classes of practitioners who are welcomed by the new Code ; but, aside from some rhetorical reference to liberty, progress, inalienable rights, etc., his remarks are devoted entirely to the legal aspect of the question, and the obligation which he claims is placed upon the medical societies of the State by the various medical acts of the State Legislature.

I shall not discuss at present the ethical principle involved by our recognizing in the new Code officially, as it were, the right of those whom we have formerly entitled irregular practitioners to exercise the duties of physicians ; I will only call attention to our relation to the law.

Is there any one who will claim for a moment that the law *created* the Medical Society of the State of New York, or for that matter any other medical society? It is simply an impossibility for the law to exercise such a function. The first condition for the organization of a society of the nature of medical societies is the coming together or agreement of a certain number of individuals having certain interests and objects in common. Here we have the essential idea of the society upon which the law may confer certain corporate rights, which no doubt may, and in fact often do, amount to privileges. It is not necessary that there should be formal meetings and organization before the incorporating act of the Legislature, but it is necessary that there be men ready for the corporate work, and practically we find that these men are the originators and promoters of the special law. The laws of the State of New York have never defined the duties of individuals or societies in matters of ethics, while, on the other hand, in medical affairs these matters have been distinctly and properly left to physicians themselves, by the acts incorporating the various societies representing what we will call differences in opinions and practice.

The Act of 1880 can in no way be construed as compulsory in matters of practice, either as to the persons we shall accept as patients or the physicians whom we shall meet in consultation. These are matters of individual liberty, and any restraint put upon us concerning them by the law would be contrary alike to the spirit of the age and the genius of our political institutions. We are at liberty to respond to a call or to decline going. We can meet another physician in consultation or refrain from doing so, and the law cannot interfere; we are private citizens and not officers of the State, and I believe the best interests of society will be served by our continuing to occupy that relation to the law.

As members of the State and County Societies we are at liberty to frame for our guidance such rules and regulations as seem best, simply keeping ourselves in this instance, as in other relations of life and in common with other citizens, free from violation of the laws.

If the regulations adopted seem onerous or unjust to individual members, they have the right of protest and of effort to secure action favorable to their views; and finally, if the difference be irreconcilable, there remains the "inalienable right" of withdrawal.

The statement that the objectionable feature of the new Code in the matter of consultations with "legally qualified practitioners of medicine is permissive and not mandatory" seems to concede the question of law, but certainly is no argument as to the question of right. This *permission* might serve as an incentive to objectionable affiliations, and the instances, now too common, of men serving low and selfish purposes with the indorsement of honorable associations and the livery of honest intent would be multiplied.

I cannot see any additional light as to the legal status of the question in the opinions quoted from lawyers. It is possible that the "Professor of Municipal Law" may have been studying closely the various acts and projected acts of the Legislature concerning the city of New York during the last quarter of a century, and thus have become confused when he takes up the question of our rights and duties.

I trust our societies will continue free from any interference on the part of the Legislature comparable to that visited upon some of our municipalities, but, failing to maintain that freedom, it would be the part of wisdom to forfeit our corporate privileges and become simply voluntary associations.

Unless it can be shown that the law is compulsory in this matter, it is idle to raise the question for argument. I listened attentively to the discussion at the recent meeting of the State Society, and I heard no reason advanced in favor of the new Code, except that an adherence to the former Code placed us in hostility to the laws of the State, and a certain amount of sentiment as to a generous spirit, a progressive age, efforts for a higher standard of qualification and the like. These statements are not arguments, and become nonsense unless supported by a plain and distinct array of facts showing their truth.

I heard no one deny the legal right to decline a consultation with any physician, regular or irregular, so that the consultant felt that he preferred to decline, and I have yet to hear the proof from the champions of the new Code that a physician can be what we have termed an irregular practitioner, and at the same time a proper and desirable person for fellowship in our societies or to be met in formal consultations.

In the discussion of the question that will occur till the meeting of the State Society in February, 1884, and at that meeting as well, it is desirable that we confine ourselves as closely as possible to the real merits of the case, and leave the idea of "courtesy to the Legislature," etc., alone; and, above all, unless some statutory obligation can be shown which will make us liable to some penalty for a particular action in the premises, let us hear no more of the law.

E. D. FERGUSON, M. D.

Troy, N. Y.

The many statements so often used that the State has made certain persons physicians, and that any code or by-law which discriminates between these is unlawful, are therefore, as may be seen by the articles above quoted, surely erroneous.

The objectionable paragraph in the new Code says, "Members of the Medical Society of the State of New York, and of the medical societies in affiliation therewith, may meet in consultation legally qualified practitioners of medicine. Emergencies may occur in which all restrictions should, in the judgment of the practitioner, yield to the demands of humanity."

This is intended to be, and now is, the professional law of this State, and as such must have been drawn up with critical accuracy. But if so, it is void, for the law does not qualify medical practitioners in any sense of the word qualify, and therefore there are no "legally qualified practitioners" to consult with. No law has ever undertaken to qualify practitioners of medicine any more than it has undertaken to qualify practitioners of law. Law is not educational in any sense, but only furnishes the means for education.

In medicine, as in many other things, the law charters colleges and schools for the purpose of qualifying persons in particular branches of science and art, and it incorporates bodies of "citizens, not less than ten in number," to grant all sorts of licenses, diplomas and degrees, to persons whom such bodies may find to be qualified to receive them ; and then it authorizes the holders of such certificates to do certain things conditionally and not absolutely. It therefore not only does not qualify them, but it does not fully recognize nor endorse its qualifying agents in authorizing their acts, but prescribes severe restrictions and penalties upon those whom it authorizes, classifying their acts, if they be authorized but imperfectly qualified, as misdemeanors, manslaughters, etc.

It is hardly a supposable case that the Committee who drew up this new Code paragraph used this word "qualified" loosely or unadvisedly ; yet it is still more difficult to understand how they could select it for their use when it is both inaccurate and misleading, for, as is well said in the article first above quoted, physicians are in no sense officers of the law, but citizens who when qualified are authorized by the law to practice a profession under prescribed restrictions. Many writers and speakers throughout this discussion have tacitly assumed that the Committee made a mistake in using this word "qualified," as the paragraph is often if not generally quoted with the word "authorized" substituted. But this is unfair to the Committee, and is not the new Code, because it takes away a large part of the basis of argument for the new Code.

The law entitled "An act to regulate the licensing of physicians and surgeons," passed May 29, 1880, through the efforts of the New York County Medical Society, is very clear on this point, although that law was not framed by "the people of the State of New York," but by the men who less than a year later pushed the new Code through. The word "qualify" or "qualified" does not appear in this registry law at all in regard to physicians of this State, but always the word "authority" and "authorized." The applicant for registration under the act must not only swear that he is "authorized," but must show "his authority for so practicing physic and surgery." When the question of qualifications comes into this law, it is in regard to "persons coming to the State from without the State." If such have diplomas they must be presented to the incorporated medical colleges or schools of this State "with satisfactory evidence of his good moral character, and such other evidence, if any, of his qualifications as a physician or surgeon as said faculty may require. If his diploma and qualifications are approved by them, then they shall endorse such diploma," and then this shall be competent authority for registration and license to practice. This and all other laws authorize, but do not attempt to qualify practitioners of medicine, and therefore there is no such thing as a "legally qualified" practitioner of medicine in any proper sense, although there are large numbers of legally authorized practitioners of every shade of high moral character and qualification, as well as of every shade of moral degradation and incompetency. A code of ethics tends to keep these two classes distinct and separate, even though a sharp line be impossible where the classes meet. But the new Code and no Code remove all distinctions.

This authorizing and licensing registry law, which seen now in the light of more recent action, appears as the first public step taken in this no code movement,—levels all inequalities, and ranks the best names in the profession with those qualified for no profession and undeserving of recognition, whose lack of qualifications must be all the more dangerous to the public welfare for being legally authorized and licensed. This class, though legally authorized in a roundabout way through diplomas and certificates of bodies incorporated under a general law, would never have been legally recognized and licensed but for this registry law, and the harm done by thus recognizing a large number, will far overbalance the good of preventing the registry of a few, or the prosecution of a few who may be so incautious as to register fraudulently.

The Register of Kings County contains the names of 974 persons who are now authorized to practice medicine here. Of these 765 registered in 1880, the year in which the law took effect. In 1881 the additions reached 104 names. In 1882, 77 registered, and thus far in 1883, 28, making an aggregate of 974, a few of whom are now doubtless dead or removed. The *Medical Register* for 1882–3, which practically embraces the same area, and which registers the names of all persons in the regular profession, contains 488 names, and the active membership list of the County Society has somewhere about 370 names. Hence, the legally authorized practitioners number about 974, while the regular profession numbers about 488, or just about one-half of the 974, and a portion of the 488 are determined to destroy all impediments to their consultations with the 486, and this on the ground of liberality and humanity.

In looking over the Register to see upon what kind of authority these 486 persons are licensed to practice medicine, and considering this motley list of authorities in its relations to the "Gentlemen's Code," by which the "liberals" admit them to fellowship and community of interest in an important profession, it is very hard to understand in what possible way the movement can be either humane or liberal, or for the public good.

If, prior to this agitation illiberality and inhumanity in any form had ever been charged against the regular medical profession, then a reform in the name of liberality and humanity would be in a natural order. But when all the world knows that in all modern time the regular medical profession has rendered more unpaid service than any other class in the world, and that as a profession it never disregards any call from the sick, it seems very unnatural and very unfair for a part of that profession to seek to make popular capital against the other part by claiming greater liberality and humanity. Such claims give fair ground for the suspicion that the name of "liberals" and the term "gentleman's code" are intended to lead to the inference of illiberality and an ungentlemanly code on the other side of the issue, and thereby to gain popular favor by inflicting a popular injury. True liberality needs no support that can be had through invidious distinctions and injurious inferences, and such tactics are sure to provoke, sooner or later, an equally intemperate reaction, until finally those who use them are met with their own weapons and the contest becomes bitter and irrational on both sides.

The intensity of feeling and action on the part of those seeking this change has always been greatly out of proportion to the merits of their undertaking, when it is remembered that the effort is merely to overthrow a code of rules which, based on high and sound morality and justice, never have done any harm, and never could do any harm, even if they stood for all time as the dead letter which they are claimed to be, to some living under them. Such a movement having been undertaken, and having met with an opposition that is at least very respectable both in character and numbers within the State, and by almost universal condemnation in the nation at large, against whose code the revolution is aimed, it seems wonderful that more moderate counsel has not prevailed within the movement, especially when it has become so plain that the ultimate object is simply consultations with sectarians and dogmatists whose capital in their trade, and whose chief elements in limited success have been their real and assumed opposition to the principles and practice of the regular and established profession of medicine. If, as is asserted, these dogmatists have abandoned their dogmas, and now really practice upon the principles of rational medicine, but keep up their distinctive names as trade-marks, to support a competitive opposition to the system of rational medicine to which they have been compelled to return; and, adhere to their names as mere baits or bids for popular favor, then so much the worse for this movement for free consultations, which thus becomes immoral and wrong, entirely irrespective of the question as to whether such consultations be forbidden or be permitted.

But, notwithstanding that there is no great harm charged against continuing to live under the old code until it can be modified, if need be, by cool and deliberate general action, through legitimate channels at all times open to every local organization, great or small,—this local movement has gone on gaining intensity and losing temper, until now it is rapidly inducing the same spirit of intolerance of opposition in those who have heretofore simply stood firmly in defence of an established position attacked from within its own borders by a discontented faction, none of whom have as yet resigned membership in the organizations wherein their own signatures pledge them to the support of the code of laws which they now seek to destroy by narrow and illiberal expedients. And they are shocked beyond measure when their action in attack has excited a somewhat similar line of action by their opponents in defence. In this they seem to forget the natural law that action and reaction are always ultimately equal.

THE MOVEMENT IN KINGS COUNTY.

During several months past the Kings County Medical Society has stood by the old code through resolutions passed at the November meeting by a vote of 51 to 40 (see page 233). But it has been claimed that subsequent action in the Society, and the action of the State Society in February had changed the sentiment in the Society, and that it must now, merely as a matter of form, change front and wheel into line with the State Society, and consider the question of code as having been definitely settled for it by the State Society regardless of its former vote. And the fact that this former vote was taken at a meeting which, however large in proportion to its general meetings, still embraced less than one-third of its active membership, gave some support to the claim that this vote might not represent the real sentiment or will of the Society.

Other counties having been placed in the same position, a general State movement was organized for the defence of the Code of The Americal Medical Association. The central organization was located in New York city, and all the counties of the State were invited to form similar organizations for this single purpose, to ascertain through concerted action what the real sentiment of the profession of the State might be upon the issue involved. Kings county, with the others, was invited to join in this by the formation of an association for local concerted action so as to be properly represented in the general action.

In considering this invitation from the central body it was thought to be but fair and just to the County Society to first give it the opportunity of clearly defining its position on the issue,—let that position be whatever it might be,—before going outside of the Society for an independent action. With this single object in view the writer prepared the following preamble and resolutions, and presented them at the March meeting of the Society, with the introductory remarks which precede them :

MR. PRESIDENT, it is very evident to all of us, since the recent meeting of the State Society, that the question of codes of ethics is still unsettled, and there is every probability that it never can be considered as settled in that Society until it be first settled in the constituent County Societies by the profession constituting these primary organizations. And in these it must be settled, if at all, by something like a full vote, and by decisive majorities. It seems apparent of late that subjects of such importance as this cannot be definitely settled at meetings where less than a third part of the membership roll is present, and therefore some method must be found of getting something like a full expression of opinion by a full vote on the subject.

Besides, all the County Societies are now called upon to change their By-Laws so as to be in accord with those of the State Society, and to submit authenticated copies of their By-Laws to the Committee on By-Laws of the State Society before the next annual meeting.

Again, this Society has elected delegates to The American Medical Association, which Association meets in June next, and this Society must, before that meeting, decide whether it will or will not change its By-Laws to accord with those of the State Society. Because, if it does so change them, its delegation will be certainly refused by The American Medical Association, and if it does not decide to change them, its delegation will at least be placed in an equivocal position before the National Association by being unable to say whether or not the change will be made in accordance with the requirements of the State Society.

The following preamble and resolutions are therefore offered for the consideration of the Society, to lie over and come up for action at the next meeting in April. If they should be seconded, they will be published in the "Proceedings," for the general information of the members, so that action upon them in April would, if they should be adopted, give time enough to carry out their objects before the May meeting, this May meeting being the last one before the meeting of the American Medical Association :

Whereas, The N. Y. State Medical Society has confirmed its new Code of Ethics, and by a special resolution has required that the County Medical Societies change their By-Laws to accord with this action ; and

Whereas, Notice is given that at the next annual meeting a proposition will be made to abolish the New Code and have no Code of Ethics at all ; and

Whereas, It is highly desirable but impossible at any meeting of this Society to get a full expression of the will of the profession of this County on the very important issues involved in this movement ; therefore be it

Resolved, That the active membership list of this Society be polled, and each member be separately and earnestly requested to vote whether he is in favor of the old Code, or of the new Code, or of no Code.

Resolved, That the Council be charged to prepare a paper headed by this preamble and resolutions, and cause it to be presented personally to each member on the active list of this Society with an earnest request that he may sign it, and append to his signature either the words "Old Code," or "New Code," or "No Code," according to his convictions of which side of this issue should be taken by this Society.

Resolved, That this list when completed be presented to the Society and be published in the "Proceedings" as a correct basis for the position which this Society is to assume in the State Society, and in the profession at large, on this subject.

As anticipated in their preparation, the meeting was a very small one, and small or large it would have been unfair to press them through without due notification to the entire membership, therefore they were seconded and laid over as a special order of business for the April meeting, and were duly published in the "Proceedings" of the Society and sent to every member.

At the April meeting they were duly called up for action, and a larger number of members than usual was found to be present. Although prepared with great care and a studied effort to avoid all discussion except upon the need for taking the full and complete sense of the Society on the subject, and upon the best method of doing this,—the resolutions were at once opposed on the ground of re-opening an issue which had been settled for this Society by the State Society,—and that a failure to acquiesce in this settlement was an act of nullification in a subordinate body to the act of its superior,—and that this Society was tired of having this subject brought up in hindrance of scientific business, etc. Not one word was offered in direct objection to taking the complete sense of the society's membership, nor to the means of accomplishing this, but the resolutions were arbitrarily tabled by a vote of 54 to 30, or nearly two-thirds majority, given by about the same members under the same leadership who appear at the meetings whenever this subject comes up,—which number is really a very small minority of the list of about 370 names constituting the active membership of the Society.

Immediately after the resolutions were tabled a motion was made that the subject of the Code of Ethics should not be brought up in the Society again for a year. This motion was protested against as being informal and void, since it attempted to abridge the guaranteed rights of membership, but it was carried, nevertheless, by about the same majority.

Then the same member moved, in effect, that the Council of the Society be directed to correspond with the Committee on By-Laws of the State Society to ascertain what changes were needed to bring the By-Laws of this Society into accord with those of the State Society, and to make such changes as were needed for this purpose as mere matters of routine business.

Before this motion was put a motion was made to adjourn, which took precedence of it and was not debatable. It was opposed, however, until the mover of the former motion said, "Never mind, we will vote it down," and the motion to adjourn was voted down by about the same vote and the same majority.

Then the motion to direct the Council was put, and carried by the same vote and majority, in direct disregard and defiance of a By-Law of the Society, which says (see Chapter xviii., Article 1), "Amendments proposed to these By-Laws can only be adopted at annual meetings. They shall be proposed in writing at any previous stated meeting, and the concurrent vote of two-thirds of the members present shall be necessary for their adoption. At the December meeting all proposed amendments shall be read to the Society."

Thus it will be seen that about 54 members,—or just about one-seventh of the active members of the Society,—were able to carry through measures which were all arbitrary and overbearing, while some of them are void by being in defiance of the By-Laws of the Society; and thus the effort to obtain the complete sense of the Society on the main issue was defeated.

Such methods and measures are highly discreditable to any cause, and it is far better to be defeated in defending a high standard of morality and right against such modes of attack, than to resort to them. They are not uncommonly resorted to on the aggressive, attacking side of this controversy, but, when two days after the above-mentioned exhibition of them, they were successfully used against them, on much better grounds, in the N. Y. Academy of Medicine, they are stigmatized with great vehemence, and a very free use of abusive and injurious epithets, calling to mind the bitter complaints and grimaces of the Chinese when the English had captured their forts by a quiet rear attack. With much noise, and horrible faces and gesticulations they said: "That's not fair; that's dishonorable! If you want to fight us, stay round in front of our big guns." The resemblance is reversed, however, in the attitude of the attacking and defending parties, since it is the defenders of the National Code who are now refusing to have the opium forced upon them, and the attacking force which complains that the defenders do not stay in front of their big guns.

After the decisive defeat, by a few members, of the simple and fair proposition to ascertain the true sense and judgment of the entire membership of the Kings County Society, there remained only the alternatives of abandoning the object altogether, or of trying to accomplish it through a temporary organization of the profession outside of the Society, as had been done in other counties.

To abandon the object at this stage and under these circumstances was out of the question, and therefore, a meeting was called to form a temporary association for the single and simple purpose of defending the Code of Ethics of The American Medical Association, and resisting any change in it which does not emanate from the body which formed the Code.

This meeting adopted the plan of organization proposed for the counties, by the Central Association of the State, and decided to act in affiliation with that Association so as to ensure the effect of concerted and combined action at the next meeting of the State Society. An executive committee of nine members was selected and authorized to carry out the objects of the Association.

The Committee met and decided upon a very simple, open and logical plan of action, the first step of which is to make a thorough personal canvass of the regular profession of the county by the list of the Medical Register by one or more authorized agents, earnestly soliciting each member of the profession, by a personal interview, to sign his name and append to it his deliberate vote, either for the National Code, the New Code, or no Code. Anticipating an attempt at defeating this vote, by those who defeated it in the Society, through a refusal to sign on such grounds as that they had already taken action, and that the question was definitely settled,—that it is a great hurt to scientific interests to keep up this agitation,—nullification to resist the new Code, etc., the committee would take the names of all who decline to sign, thus making the record complete for a final counting.

Then when this count is made the Committee will have a sound basis for further action, such as they could have in no other way. If the majority was found to be against the Association, then it would only have the weight of a minority influence in association with the other counties, and would have to be satisfied with this; and but little farther action would be needed than simply to see what the minority was, and that it be fairly and actively represented in the convention of the counties. But if, as is confidently hoped for, there should be a majority on the side of the established rules, and against the disturbing agitation, then much could be done to give legitimate effect to so important a decision so fairly made by a county so prominent, and one which up to this time has been so emphatic in supporting and defending the National code.

The recent action taken in the N. Y. Academy of Medicine seems to be briefly and substantially as follows: It was not known how the Academy stood upon this question, and yet its delegates at the late meeting of the State Society had committed it to the new code side by voting two for the new code and one for the old. It had not, however, altered its By-Laws, which embrace the National code, nor had it acted in the matter in any way, but probably no member failed to realize that the issue must come, and that the disturbing elements were earnestly and actively though quietly at work. New members were applying for admission, and if the majority of the profession in New York County in favor of overturning and reversing the old code was as large as it was claimed to be, a majority of these admissions would be no code men, and the no code party in the Academy would be constantly gaining strength, while every new member was signing a Constitution and By-Laws containing the old code and promising to uphold them, as the conditions of his admission to membership. If then a majority of the new members, being no code men, were signing a compact which they would take the first opportunity to oppose, and if possible break up, it was fair to suppose they might be signing merely in a perfunctory way, and in ignorance of the fact that they were pledging themselves to uphold a code which, their convictions being opposed to, they were really seeking to destroy. Others might sign with the mental reservation that since the action of the State Society, and especially as that action had been supported by the Academy's delegates, the old code was really abrogated, and the new code was that which he actually was signing. This is not a violently strained position for a no code man to take, for it is the logical deduction from their arguments that the old code is void in this State, because it is unlawful in the State and in the State Society and all affiliated bodies.

At all events new members were being admitted and were all pledging themselves to the old code by their signatures; and none of the old members were resigning since they had changed their convictions, nor withdrawing their signatures and pledges to a code which they were now striving to abolish, and almost if not all the officers of the Academy were prominent active opponents of the old code By-Law.

Under these circumstances it was not only perfectly fair, but entirely legitimate, proper, wise and just to bring resolutions instructing the Committee on Admissions not to report for admission to membership any person who could not conscientiously sign a Constitution and By-Laws which contained the national code of ethics, the effect being, as stated, to refuse admission to all new code and no code men until the Academy should change its constitution and code of ethics. That is, it would not let in men who would pledge themselves to the old code as a condition of admission and then continue to be elements inside, as they had been outside, for abrogating the rules which they signed.

There is nothing in the action to indicate any opposition to a member's pledging himself honestly to the existing laws, and then after admission as honestly changing his mind and then working against his signature which carried former convictions now changed.

On the contrary, the most prominent men in the new code and no code movement were present and were exactly in this position, and their rights and votes were fully recognized. It is true that under the excitement of the discussion several of them resigned, including the President, Vice-President and Treasurer of the Academy, as from their position of intense antagonism to the organic existing law of the Academy they were logically bound to do. But the resignations appear not to have been accepted, and it is now publicly announced that they will withdraw them, although this announcement seems to be a mere rumor that cannot be confirmed until the next meeting of the Academy in October.

It must therefore be acknowledged that this action by the Academy was eminently right and proper, and had due public notice been given for a month there could be no just cause of complaint. But, on the other hand, it was done exactly as the new code was adopted in the State Society,—that is, practically without due notice, and in that respect both actions were equally illiberal, unfair and unjust. On both occasions earnest appeals were made for time for mature deliberation and wider action, but in both cases this was arbitrarily refused and voted down, and both measures were pushed through by solid voting.

The meeting of the State Society of 1882 was an ordinary meeting with the customary notification, and the meeting of the Academy was exactly the same, both meetings under the control of officers publicly committed to the attack upon the old code. The new code movement was a surprise at an ordinary meeting, and the resolutions at the Academy were no greater surprise, but were simply on the opposite side of the issue, and both surprises were managed with the same skill and dexterity in obtaining a two-thirds majority for the surprise, and this majority in a small ordinary meeting will probably be found difficult to overturn at larger meetings, at which neither of them could have been carried by the requisite two-thirds. The strong contrast between the two movements is that the last one excited by far the most intemperate action on the part of the defeated element, and got into the newspapers in a very sensational way.

Why this method by surprise was taken in either case can only be conjectured of course, but the probability is that the motive was the same in both cases,—namely, to carry the measure through. If this was wrong in the first instance it was of course equally wrong in the second,—and it was undoubtedly wrong in both.

If the first wrong had not been perpetrated, and had not been followed by a series of similar wrongs, like that in the Kings County Society above mentioned, then it is probable that this action in the Academy would not have been taken.

It is a platitude to say that one wrong does not justify another, or that any series of wrongs should excuse or extenuate a single one, but society is at present so organized that when men's passions and prejudices are fairly roused the law of retaliation is about as sure as the law of gravity, and he who sows to the wind sooner or later reaps the whirlwind.

Civilized society goes on condemning retaliation and preaching against it, but continues to practice it with unfailing certainty.

OPIUM ASSAYS.

Since the last note upon this subject, at page 175, thirteen cases of opium have been assayed, including nine cases of Persian opium, the latter being quite new to this market, though long known in other markets, and to makers of morphia salts.

In January two cases of Yerli opium were sampled and assayed by the process given at page 14. The opium was of tolerably uniform consistence and color and of good appearance, and contained the amount of leaden bullets so common to Yerli opium as to be almost characteristic of this variety,—that is in working up a series of cases bought as Yerli opium, if no bullets were found this would be some cause for suspicion that the opium was not of the kind properly called Yerli. From these two cases about 1.2 pounds of bullets were obtained. The results of the assay were as follows :

In the moist condition, as received :—

Case 1. Water 21.77 p. c.; Residue 29.40 p. c.; Morphia 12.92 p. c.;
" 2. " 21.12 " " 29.66 " " 12.90 "

They were, therefore, practically the same Opium, the difference being quite within the liability to error in assay.

When dried and powdered, the yield of morphia from the powder was 16.52 and 16.35 p. c., and the powder, in common with powdered opium in general contained about 4 p. c. of hygrometric moisture lost in farther drying to a constant weight at 100° C.= 212° F.

In March,—Yerli, Salonica and Bogaditch being all accidentally absent from the ordinary channels of the market and noticeable from the rarity of the accident,—a selected case of Karahissar opium, of very fine appearance and uniform consistence, was assayed with the following results:—

Water 20.88 p. c.; Residue 34.83 p. c.; Morphia 12.15 p. c.;

Reduced by calculation to the condition of powdered opium, Morphia 15.51 p. c.

In April one case of Bogaditch opium,—a special importation,—arrived and was assayed with the following results :—

Water 18.40 p. c. ; Residue 30.14 p. c. ; Morphia 13.27 p. c. ; when dried and powdered the powder gave 16.26 p.c. of morphia.

Thus the powdered opium from these four cases would be, say, 16.5, 15.5 and 16.3 p. c., averaging about 16.16 p. c. and not differing in the extremes more than about 1 p. c. Powdered opium for medicinal uses should not vary much more than this.

PERSIAN OPIUM.

Persian opium has not been recognized in this market for many years, and if any was admitted through the Custom House, it was probably admitted under bonds to the makers of morphia salts. In other countries into which it has gone it was always found of low grade, not only in the proportion of morphia it contained, but also in containing some admixed greasy substances which rendered it difficult to work, and required for it special processes. It is said to have rarely contained over 7 p. c. of morphia, and has ranked with the Egyptian and other inferior varieties of the drug, excluded by law or regulation from this country. Last month, however, a trial shipment of three cases was consigned to a prominent New York house, and was held in bond subject to assay. The writer found it well put up in gunny-covered cases Nos. 8, 9 and 10, showing it to be part of a series, the other parts of which went elsewhere. Each case contained just 130 pounds and exactly 160 lumps of tolerably uniform size, shape and consistence, so that the lumps averaged just 13 ounces avoirdupois, or nearly 369 grammes. The lumps were plano-convex as though made spherical when soft and laid upon a flat surface to bake or dry, and they were undoubtedly baked in the drying process, for the shell was hard and broke with a conchoidal fracture, while the interior was less hard as the centre was approached. The whole lump was, however, so hard as to break to pieces under blows with a hammer. The lumps had smooth, polished surfaces of a shiny dark brown color, and a slightly greasy feeling to the touch, but yet not greasy, but quite dry. Cut in two and exposed to the air for two weeks or more, neither the internal nor external surfaces appeared to either dry farther, or to attract moisture. Moderately warmed they became soft, and were easily rolled out into thin cakes for drying farther, and with but little drying, and that at low temperatures, they were easily ground to powder. The lumps were quite homogeneous and uniform in texture, and only very slightly softer toward the centre. A very few of the lumps showed fragments of poppy leaf adherent to parts of the surface, and generally to the flat part. Each lump was carefully wrapped in a coarse gray bibulous India paper, and they were packed without intervening powder or leaves of any kind. The sampling for assay was difficult on account of the hardness, but a fair sample of every tenth lump was taken by boring a conical hole to near the centre of the lump with a pen-knife blade. In this boring the surface shelled off in small scales, and the internal borings were in coarse powder. Macerated in water, no matter whether in the unbroken lumps or fragments, in borings or in powder, it broke down easily and speedily to a very uniform fine pulp or magma, which was easily exhausted and conveniently worked.

Subjected to the process of assay, as given at page 14, this opium yielded in the undried condition: For No. 8, 15.03; No. 9, 14.57; No. 10, 14.65 p. c. of morphia. But the lime-water test subsequently showed that for this opium the ether did not remove all the narcotine. Therefore the crystalline powder which had been taken as morphia was washed with lime-water and the residue of undissolved narcotine was dried, weighed and subtracted, and as this residue amounted to just about 4 p c. in each case, the true morphia yield was reduced to 11.0, 10.6 and 10.7 p. c. Or, for the opium if dried, a little over 12 p. c.

The ether used in the assay process extracted an unusual amount of narcotine, and fresh ether did not extract more, so that it seems probable the narcotine present which the ether failed to take out, but which the lime-water rejected, was so combined as to be insoluble in both ether and lime-water.

More recently six additional cases of this same opium has reached this market, and an average sample from the six cases was assayed. This sample, taken in the form of borings, was, however, kept many days in a pasteboard sample box before being weighed off for assay, and had therefore doubtless lost some of its moisture. The assay in that condition gave:

Water, 8.7 p. c. Residue, 24.3 p. c. Morphia, 13 p. c.;
Or from the dried Opium morphia, 14.3 p. c.;

It seems entirely probable that these two lots of opium were of the same quality, and that the difference between the assays is due to not knowing how to manage the opium the first time.

From the behavior of this opium in working it is evident that it could be easily made of a still higher grade of quality by keeping out more of the glucose-like substance which it contains, and it needs but little in this direction to make it as good or better than the opium of Anatolia, and if bought or sold by assay each would command its true value in the market and the effect would be to improve the quality of both.

It will be a favorable circumstance for the markets of this country if a Persian opium of this and higher grades can be brought here to compete with the opiums from Anatolia, for hitherto there has been no competition, and therefore no check upon the price nor upon the cornering speculations which have so often disturbed the market.

It would not be justifiable until more is known of the therapeutic qualities of this Persian opium to powder it and sell it as powdered opium. But for making assayed preparations of opium, and for making morphia and its salts, it can be confidently and properly used, although it is not strictly officinal as "obtained in Asia Minor."

IMPROVEMENT IN LITMUS PAPER.

In the Proceedings of The American Pharmaceutical Association for 1871, page 515, the writer asked attention to the fact that litmus paper which was very blue or very red was not sufficiently sensitive, and a formula and directions were given by which a pale and purplish shade of both the blue and the red were attainable, these being much more sensitive and therefore much more desirable than the deep blue and red then commonly demanded. The subsequent experience, extending over the past twelve years, during which very considerable quantities of these test papers have been made, has constantly tended to get farther and farther away from the pronounced blue and red colors, and nearer to the intermediate purple, so that now that called by old usage blue, is hardly blue at all, but is purple, while that labeled red is also purple, with only a little predominance of the red element.

Thus a point has been gradually attained where, for increased sensitiveness, the colors are both purple, and the difference between the two so slight as to be quite unimportant. The former distinctive names of blue and red are therefore no longer accurate, and the simple name litmus paper would be sufficient and more accurate, and therefore better, and one kind of paper would take the place of two, with greatly improved sensitiveness and convenience.

This purple test paper is quite unchanged only in solutions which are accurately and positively neutral. In ordinary water from the same source it will at one time be changed slightly to a redder purple, and at another time to a bluer purple, while a very small amount of alkali or acid will turn the same paper to either blue or red, with a purity of color proportionate to the amount of alkali or acid. Suspended in the air of ordinary apartments, and kept moist by some neutral hygrometric substance, it will be noticeably more blue or more red on some days than others, and this will be rendered more perceptible if the color be matched at one time with something that does not change.

The improvement therefore consists in having a single test paper which will take the place of two, and will be more sensitive in its indications than either of the two former colors. Those who use litmus paper should therefore not complain and send back their test papers when, though labeled blue and red, they are found to be neither blue nor red, but both purple and hardly distinguishable, because this is the very best condition for accurate use. And, when this is so generally recognized as to enable makers to label it simply "Litmus Paper," and only send one kind, without having it sent back with the complaint that two colors were ordered and only one sent, then the full advantage will be realized. Of course, paper so sensitive should be kept in corked vials, and is best handled by small forceps.

THE PHARMACOPŒIA OF 1880.

(Review continued.)

Important Correction.

The writer is very much indebted to Dr. B. F. Davenport, of Boston, and others for pointing out a mistake made on page 263 of the last number of this pamphlet. The 16th line from the bottom of the page reads "weigh 167 grains of Acetic Acid," etc. This should read 60 grains instead of 167, and every one who preserves that pamphlet should at once turn to that page and line and cross out the 167, and write 60 over it. As it stands it is very misleading and requires the entire 1,000 grains of the solution for exact saturation if the acid be 36 p. c.

It seems particularly unfortunate that of late the Pharmacopœia is being subjected to popular or newspaper comment and criticism upon insufficient grounds. The writer, as well as many others, has frequently been interviewed by the representatives of journals and newspapers to obtain expression of opinion and judgment upon its merits and demerits, and it is sometimes quite difficult to decline these interviews without conveying the impression of illiberality and discourtesy. There is, perhaps, no more difficult task than that of making up a just and true judgment upon such a work, and nothing more dangerous than the praise or blame that is undertaken on insufficient grounds.

These reporters are invariably told by this writer that a forty years' familiarity and experience with the materia medica both in its therapeutical and pharmaceutical relations are not only insufficient grounds for a snap judgment, but that on the contrary they should teach extreme care in any handling of so very important a matter.

The Pharmacopœia is a voluntary work, of a volunteer organization, and has no legal status nor compulsory nor mandatory force, but has to depend entirely upon an intangible moral support. It is simply the code of ethics and the moral law of the materia medica. Many know little or nothing about it, rarely see it, and never read it. Many others follow and support it. But by far the largest number disobey it, and disregard it, except when it happens to be to their interest to find fault with it in order to excuse their disregard. Yet it is not only a standard, but the only attempt at a standard for a large and important interest of a nation of people. To weaken its influence is a step toward its abrogation, and toward that free trade where everybody would be guided by his own conscience and conviction, in strength, quality and combinations of medicinal substances, just as he now is in the empiricism and cupidity which dominate the materia medica outside the scope of the Pharmacopœia. And yet a large number of both physicians and pharmacists have already been found ready and willing, through these interviews for publication, to discredit and condemn it in a general and indiscriminate way, and on grounds quite insufficient.

Few seem to recognize the extent of such a work and the labor involved in it, and the impossibility that any such work be either complete or faultless, and therefore that any careful review of it must necessarily discover many imperfections. But as most of these are due to the acceptance of untried authorities, and the impossibility of trying everything within the time allotted, they only need to be found and pointed out for the use of future revisions.

If this be carefully and properly done it does not hurt the work at all, nor weaken its influence for good. But if physicians and pharmacists continue their emphatic criticisms and their snap judgments, given for the most part without reasons for them, there will soon be a large following for those who would abrogate or abolish the Pharmacopœia for a new one which would suit them better, or would abolish all pharmacopœial attempts to interfere with or control individual convictions, since a very specious and plausible line of argument could easily be found in support of a plan by which each physician should be the sole judge of what he should use, and each pharmacist and druggist the sole judges of what they should supply, controlled only by individual knowledge and conscientiousness. This is the "new code" and the "no code" side of this question and the liberties of this class are now lost, and their lives a burden to them, so far as the moral restraints of a code called the Pharmacopœia are effective, and they could truly say, that while a few are bound by its principles and practice, to the vast majority it is a dead letter or a hurtful sham, and therefore unnecessary.

Criticism, properly applied, is the safeguard of truth, but it can only successfully combat ignorance and error where the criticism is based upon reason and justice. Hence, if every one would but hesitate a little and be careful to publish the reasons for his criticisms, then others, if sufficiently well informed on the subjects at issue, could judge of the force and applicability of the criticisms. But a majority of the readers of newspapers are not well informed on the subjects involved in a pharmacopœia, and therefore are not good judges of the value of the criticisms they read, but would be likely to join at once in any clamor for the widest liberty in pharmacopœial affairs, even to the breaking down of all moral barriers to free medicines.

ACIDUM ARSENIOSUM.

ARSENIOUS ACID.

As_2O_3; 197.8.—$As\,O_3$; 98.9.

[ARSENIOUS OXIDE; WHITE ARSENIC.]

A heavy, white solid, occurring either as an opaque powder, or in transparent or semi-transparent masses which usually have a striated appearance; permanent in the air, odorless and tasteless, and having a faintly acid reaction. Soluble in 30 to 80 parts of water at 15° C. (59° F.); the solubility varying with its physical condition. It is slowly but completely soluble in 15 parts of boiling water. In alcohol it is but sparingly soluble. It is freely dissolved by hydrochloric acid, the alkalies and their carbonates, and is moderately soluble in glycerin. When heated to about 218° C. (424.4° F.) it is completely volatilized, without melting, and when thrown on ignited charcoal, it emits an alliaceous odor. An aqueous solution of Arsenious Acid affords a lemon-yellow precipitate with test-solution of ammonio-nitrate of silver, and a grass-green one with test-solution of ammonio-sulphate of copper; and, if the solution is acidulated with hydrochloric acid, a bright yellow one with hydrosulphuric acid. This latter precipitate is soluble in test-solution of carbonate of ammonium and insoluble in diluted hydrochloric acid (distinction from sulphides of antimony and tin).

If 0.247 Gm. of Arsenious Acid be dissolved, with 0.5 Gm. of bicarbonate of sodium, in boiling water, the solution should decolorize not less than 48.5 C. c. of the volumetric solution of iodine (corresponding to at least 97 per cent. of pure Arsenious Acid).

Preparations: Liquor Acidi Arseniosi. Liquor Potassii Arsenitis.

There are one or two points in this excellent description which possibly deserve attention. As commonly met with it is in opaque porcelain-like masses, but occasionally, if recently sublimed, in vitreous masses. These masses gradually become opaque and porcelain-like from the surface toward the centre until the whole mass is changed from the vitreous or transparent to the porcelain-like or opaque condition. On opening an original package which is a few months old the whole appears like broken masses of porcelain, but upon breaking the lumps the interior will be found glass-like, and the opaque coating will be thick or thin in proportion to the age of the parcel. If sublimed by separate heats or firings the masses are stratified, and then the porcelain change occurs in strata. The change has been said to be due to the formation of extremely minute fissures, and if so the statement that the opaque is more soluble than the vitreous condition is easily understood. For medicinal uses it should be in very fine powder, and therefore it is well to select that in the vitreous condition for powdering, so that when powdered and all passed through the finest bolting cloth, it will be gradually rendered still finer by the fissuring process if such fissuring really does occur. However this may be it actually appears from some rather loose experience on the subject that the powdered vitreous acid becomes more easily soluble by age.

The fineness of the powder is perhaps one of the most important conditions to be looked for when for medicinal use, and this is easily judged by shaking a very minute portion with water in a test tube and observing the rate at which the particles settle to the bottom. With the very finest powder a few seconds is sufficient to notice the accumulation of particles at the bottom, but the rate is more rapid the coarser the particles and the less uniform the powder. If now solution of ammonia be added drop by drop with frequent shaking between the drops until the solution smells ammoniacal, the particles will be rapidly dissolved to an opalescent solution if the specimen be unadulterated. This imperfect solution becomes, on warming, nearly but not quite transparent, because the attrition of the stone surfaces by which it is powdered yield enough of fine particles to the powder to render the solution slightly opalescent after all the acid is saturated and dissolved. But there should be only very slight opalescence from the finest powder, and no visible undissolved particles. These latter would indicate adulteration, and all the common adulterants would be detected in this way. This same dust of attrition makes the volatilization test of the Pharmacopœia too rigorous when applied to the powder, for with very careful and very fine powdering there will always be a residue which can be seen on a clean bright surface of either metal or glass. But in proportionate weight this natural residue will be inappreciable and unimportant.

This substance often called simply "arsenic" is a virulent and very rapid poison, but fortunately it has one simple and sufficient antidote, which is effective in proportion to the promptitude with which it can be administered. Every physician and every pharmacist should keep the materials in readiness to make the hydrated oxide of iron with the least possible loss of time, for it is doubtful if any case of arsenical poisoning would be lost if this antidote could be promptly applied. Ample directions are given for preparing this antidote farther on in the Pharmacopœia, but it may be well to mention here that life may be occasionally saved where the materials are not kept in readiness by a rapid extemporaneous process, the materials for which are generally within easy reach without much loss of time. Any solution of ferric oxide will answer in an emergency, and any one should be used rather than to lose time. Solution of the subsulphate of iron (Monsel's solution), or of the tersulphate, or of the chloride, or of the nitrate, will answer well, and all that is necessary is to add water first and then solution of ammonia, the latter in sufficient quantity, but not in such excess as to be caustic or irritant. But the solution, which is almost invariably within easy reach with least loss of time, is the Tincture of the Chloride of Iron. Every pharmacist and most physicians out of cities have it at hand when they might not have anything else.

This preparation contains about 6.5 p. c. of ferric oxide, or nearly 9 p. c. of ferric hydrate, which is the antidote. Of the officinal Tincture, 2 parts by weight or volume require just about 1 part of officinal solution of ammonia for precipitation, usually leaving a slight unimportant excess of ammonia. If commercial 15 p. c. solution of ammonia be used about two-thirds the quantity should be taken. The working formula would be as follows:

Take of Tincture of Chloride of Iron	4 parts or 4 fluidounces.
Water	4 parts or 4 fluidounces.
Mix them in a bottle of the capacity of	16 parts or 16 fluidounces.
And add Water of Ammonia	2 parts or 2 fluidounces.

Shake well, pour it onto a large wet muslin strainer, wring out the water and alcohol, and replace it with fresh water. The stomach having been evacuated by emetics while the antidote was being prepared, give four fluidounces of the mixture at once, to be followed by an emetic. Then two fluidounces every ten minutes until the remainder be taken, making another portion in the meantime to be ready if needed.

ACIDUM BENZOICUM.

BENZOIC ACID.

$$HC_7H_5O_2;\ 122.—HO,C_{14}H_5O_3;\ 122.$$

White, lustrous scales, or friable needles, permanent in the air, having a slight, aromatic odor of benzoin, a warm, acid taste, and an acid reaction. Soluble in 500 parts of water and in 3 parts of alcohol at 15° C. (59° F.). in 15 parts of boiling water and in 1 part of boiling alcohol; also soluble in 3 parts of ether, in 7 parts of chloroform, and readily soluble in disulphide of carbon, benzol, benzin, and oils. When strongly heated, the Acid is completely volatilized. If gradually heated in a retort with three parts of freshly slaked lime, benzol is évolved. The Acid is freely soluble in solution of potassa, soda, or ammonia. On carefully neutralizing any of these solutions and adding solution of ferric sulphate previously diluted with water, a flesh-colored precipitate is produced.

The solution of Benzoic Acid in pure, cold sulphuric acid, when gently warmed, should not turn darker than light brownish; if now poured into water, the Benzoic Acid should separate as a white precipitate and the liquid should be colorless. A small quantity of the Acid, when taken up by some recently ignited and moistened cupric oxide, held in the loop of a platinum wire and introduced into a non-luminous flame, should not impart a green or bluish-green color to the flame (abs. of chlorobenzoic acid). The Acid should not have an odor resembling that of bitter almonds or of stale urine; and, on rubbing together 1 Gm. of Benzoic Acid and 0.5 Gm. of permanganate of potassium in a mortar with a few drops of water, the odor of oil of bitter almonds should not be evolved (cinnamic acid).

This acid is now produced artificially from so many sources and so cheaply that it is not very liable to be impure, or of bad quality. Even that made from the hippuric acid of the urine of animals is now generally very pure, and rarely has even the slightest urinous odor which formerly served to distinguish it. Indeed, there is only one single variety in the market now that can be easily distinguished, and, fortunately, that is the variety which should alone be used in medicine. Certain makers, chiefly English, continue to supply a very nice Benzoic Acid made from Benzoin, and this is technically known in the market as "Benzoic Acid from Benzoin." It can always be had in any quantity and at a moderate price, and it is easily distinguished by its peculiar light fluffy condition, and by the distinct odor of Benzoin. From the presence of very small proportions of aromatic substances this acid does not stand the rigid chemical tests of the Pharmacopœia as well as the artificial products, and of these none stand the tests better, if as well, as the acid from urine, and it is the lowest in price. Nevertheless, the acid from Benzoin is the nicest for the purposes of medicine and pharmacy, and it is that variety upon which the medical reputation and character of the substance is based. Formerly the price was 40 to 45c. per ounce, but since now it can be had for about 25 to 30c. there is no reasonable excuse for using any other variety.

It has been alleged that some manufacturers sublime the artificial cheaper acids with this, that they may get the odor and appearance; and that others mix it mechanically with that from urine with the same object of obtaining the higher price for the cheaper variety, but the writer has seen no samples of this sophistication, and there are several makers who are above this suspicion and whose factories furnish an abundant supply easily obtained in their original packages.

Recently this acid has attained some reputation as an antiseptic, and it seems probable that it is nearly if not quite equal to salicylic acid for such uses as the preservation of hypodermic solutions.

ACIDUM BORICUM.

BORIC ACID.

H_3BO_3 ; 62.—$3HO,BO_3$; 62.

[BORACIC ACID.]

Transparent, colorless, six-sided plates, slightly unctuous to the touch, permanent in the air, odorless, having a cooling, bitterish taste, and a feebly acid reaction; in solution turning blue litmus paper red and turmeric paper brown, the tint, in the latter case, remaining unaltered in presence of free hydrochloric acid. Boric Acid is soluble in 25 parts of water and in 15 parts of alcohol at 15° C (59° F.); in 3 parts of boiling water and in 5 parts of boiling alcohol. On ignition, Boric Acid loses 43.5 per cent. of its weight, and, on cooling, becomes transparent and brittle. The alcoholic solution burns with a flame tinged with green.

An aqueous solution of Boric Acid should not be precipitated by test-solutions of chloride of barium (sulphate), nitrate of silver with nitric acid (chloride), sulphide of ammonium (lead, copper, iron, etc.), or oxalate of ammonium (calcium). A fragment heated on a clean platinum wire in a non-luminous flame should not impart to the latter a persistent yellow color (sodium salt.)

This is a new article to the Pharmacopœia, although by no means new to arts and manufactures or to commerce. Long known to chemistry as Boric Acid, it is still popularly called Boracic Acid, but the Pharmacopœia has wisely adopted the shorter and better name, and thus given its influence for the more accurate and better usage.

The above description, though technically correct for some few specimens, is defective so far as the general appearance of the best market varieties go. The crystals are not transparent in any proper ordinary sense, but are in intransparent white fragments or small masses of very irregular shape, looking somewhat like unground Cream of Tartar, only less transparent. The crystalline form is not easily recognized in these little groups of fragments, and they are easily rubbed to a coarse powder between the finger and thumb, leaving a decidedly smooth unctuous feeling upon the skin. In other respects the description and tests are fairly distinctive as well as accurate so far as they go. But no means for a quantitative estimation are given, and yet are very much needed, since the market is supplied with this acid of various degrees of purity. It is very easy to get a very good acid of about 98 p. c. at a very moderate price, and nothing below this should be accepted for medicinal uses, but this degree of purity is not very easily established.

The accurate determination to within tenths of a per cent. is quite difficult, but being unnecessary, an easier and more rapid method, which should serve merely as a close approximation, should have been found and given here, as with other substances in the Pharmacopœia. The use of volumetric sodium solution gives no definite end reaction. The method of fusing weighed quantities of the acid and sodium carbonate, and measuring by the carbonic acid displaced, gives results always too high, probably because some boric acid may be carried off with the carbonic acid. Nevertheless, as an approximative test it is useful, and under restricted conditions might be sufficient.

The acid is generally required in powder for medicinal uses, yet not always so, and therefore care should be taken to order it in powder when wanted in that condition. An order simply for Boric Acid will and always should bring it unpowdered. For many of its recent uses in medicine it is required in very fine powder, and such is the only powder that should be sold. With care, in a proper mill it makes a beautifully white light powder, entirely free from particles when rubbed between the finger and thumb, feeling very much like powdered soap. It is only such powder that will answer well in eye surgery, or in general surgery for dressings; and solutions, when required, are most easily and best made from this powder.

A solution saturated at ordinary temperatures contains between 4 and 5 p. c., and from 10 grains in the fluidounce up to saturation it is frequently used as an eye wash, or to granulating and suppurating surfaces in general. It is a very bland and soothing application, whether applied in powder or solution, relieving irritation and reducing suppuration.

It is a very potent antiseptic, probably equal to salicylic acid, and is much less expensive, and its advantages over carbolic acid for some purposes are chiefly that it is odorless and more easily managed. For the preservation of hypodermic solutions it is probably better than either salicylic or carbolic acids, though comparative experiments are still needed to determine this. In surgical dressings it has the great advantage over carbolic acid that it is not irritant nor poisonous in any quantity that has been applied. Not being at all volatile, however, it has no effect in cleansing or deodorizing the air.

It has been administered internally in large doses without any disturbing effects, but only by a very few observers, so that little is known of its internal uses.

ACIDUM CARBOLICUM.

CARBOLIC ACID.

C_6H_5HO; 94.—$C_{12}H_6O_2$; 94.

[PHENOL.]

A product of the distillation of coal-tar between the temperatures of 180° and 190° C. (356° and 374° F.)

Colorless, interlaced, needle-shaped crystals, sometimes acquiring a pinkish tint, deliquescent on exposure, having a distinctive, slightly aromatic odor resembling creasote; when diluted, a sweetish taste with a slightly burning after-taste, and a neutral reaction. It produces a benumbing, blanching and caustic effect on the skin. Carbolic Acid is soluble in 20 parts of water at 15° C. (59° F.); 100 parts of the crystals are liquefied by the addition of about 5 parts of water; this liquid is rendered turbid by the further addition of water, until 2000 parts have been added, when a stable and clear solution is formed. It is very soluble in alcohol, ether, chloroform, benzol, disulphide of carbon, commercial and absolute glycerin, and fixed and volatile oils. The crystals melt at 36° to 42° C. (96.8° to 107.6° F.), and boil at 181° to 186° C. (357.8° to 366.8° F.), the higher melting and the lower boiling points being those of the pure and anhydrous Acid. On continued heating, the Acid is completely volatilized. Carbolic Acid coagulates albumen or collodion (difference from creasote). Its aqueous solution forms a white precipitate with bromine water. On adding to 10 C. c. of a 1 per cent. aqueous solution of Carbolic Acid, 1 drop of test-solution of ferric chloride, the liquid acquires a violet-blue color which is permanent (the color thus caused by creasote rapidly changing to greenish and brown, with formation, usually, of a brown precipitate). One volume of liquefied Carbolic Acid, containing 5 per cent. of water, forms, with 1 volume of glycerin, a clear mixture which is not rendered turbid by the addition of 3 volumes of water (abs. of creasote and cresylic acid).

The amount of water contained in a solution of Carbolic Acid may be determined by agitating the solution, in a graduated cylinder, with an equal volume of chloroform. After standing, the upper layer consists of the water contained in tbe mixture.

Preparation: Unguentum Acidi Carbolici.

The above definition is so loose and broad as to be valueless, for, while the Carbolic Acid here meant is certainly "A product of the distillation," etc., it is by no means the only product obtained between these temperatures, and neither the distillation nor the temperatures are at all characteristic of the particular product in question. "A crystalline product" would have helped the definition very much. But better still would have been "one of the products of the distillation of crude carbolic acid between the temperatures of 170° and 185° C. (338° and 365° F.) separated and purified by repeated crystallization."

The description and tests by which the officinal substance is to be selected also need explanation in regard to some points. The odor does not resemble the odor of creasote, and is hardly an element in the odor of creasote. In selecting it for use it is highly desirable to have it as free from all odor of creasote as possible, and this freedom from creasote odor is the very best single test for Carbolic Acid. When pure and as free from creasote as it should be, and as many specimens in the market really are, it has a clean, sweet, aromatic odor which is quite as characteristic as that of any of the aromatic series, so that this Phenol as intended by the Pharmacopœia, has even a more characteristic and distinctive odor than the essential oils, and that whose odor resembles creasote should always be rejected, for, in its uses,—especially in its most important use in antiseptic surgery by Lister's method,—it is more irritant and toxic both to patient and surgeon in direct proportion to the creasote elements present. The samples which Mr. Lister brought to this country with him in 1876 were exceptionally sweet and bland, and free from creasote odor, and he insisted upon this sweetness and purity of odor then and since, as essential to the success of his antiseptic surgery, charging many of the failures and accidents to the inferior creasote-like specimens that were not uncommonly used. Large quantities are now made both in this country and in Europe, which are quite free from this creasote odor, and can always be had at moderate prices.

The pinkish tint generally acquired by age has little or nothing to do with the purity or impurity of the acid, or rather, perhaps, the purer and more anhydrous the acid the more likely to become pinkish. It was long ago attributed to the formation of a trace of rosolic acid, but latterly it has been alleged to be due to a trace of copper. This latter is, however, improbable. A specimen of chemically pure acid sent to the writer in 1869 by Mr. F. Crace Calvert, as a chemical curiosity, has become a deeper pink with age, until now a very deep pink, yet it is free from copper, and has the same sweet, clean smell that it had when received, and similar to the best qualities of the present day; and all these better grades have less odor than the lower qualities, as well as a different odor, and as in the case of the English sample, the very finest acid is often of a pink tinge. Much of the German acid which comes to these markets is free from the pink tint, and does not acquire it, though often of low quality, and generally has an odor of volatile sulphur compounds.

"The crystals melt at 36° to 42° C. (96.8° to 107.6° F.), and boil at 181° to 186° C. (357.8° to 366.8° F.), the higher melting and lower boiling points being those of the pure and anhydrous acid."

If to be applied to the best qualities of acid in the New York market of the present time this sentence needs revision. The presence of water in greater or less proportion in the crystallized acid makes a variation in the melting and boiling points, and if the acid be of good quality, as judged by the clean, sweet odor, water is the only,—or at least the chief disturbing element. Anhydrous acid will dissolve 4 to 5 p. c. of water and still be a mass of solid crystals at ordinary temperatures,—even those of summer. But if more water than this be present the crystals will be wet in proportion, until when 8 to 10 p. c. of water be present the acid will remain liquid at common temperatures. As found in the market, of the best quality it is never anhydrous, but always contains 2 to 4 p. c. of water, and some very good acid contains much more, and the proportion is pretty well ascertained by the congealing point, although there are other matters which affect this. The melting point is very difficult to ascertain even with a moderate degree of accuracy, but the point of congelation is very easily ascertained and remains constant for a considerable length of time during the crystallization. This congealing point or crystallizing point should therefore have been given instead of the melting point. The acid should be melted by warming, a thermometer placed in it, and it should then be cooled down and stirred until the crystallization begins. It often happens that the cooling will continue to 5° or 6° C. below the congealing point, but the moment that crystallization begins the thermometer rises to the true congealing point and remains steady at that point until the crystallization is complete. Three market specimens, all of excellent quality, congealed at 29.4° C., 36.8° C. and 38.5° C., and the chief difference between the lowest and the highest was probably not over 3 p. c. of water, so that this indication for water is a very sensitive and delicate one. The specimen which congealed at 38.5° C. was nearly as good as any the writer has ever seen,—39.5° being the highest. This specimen commenced to boil at 170° C., and rose rather rapidly at first, but slowly afterward, to 182°, and finally to 183°, and after cooling it congealed at 39.2° C., the boiling having raised the point of congelation by 0.7°, probably by boiling off a very small proportion of water, the vapor of which could be plainly seen. In case of other impurities than water, however, the distillate comes over with less water and a higher congealing point, as will be seen farther on.

The specimen which congealed at 29.4° C., nearly as good in odor but not quite as good as the last one, commenced to boil at 173° C., rose briskly to 175°, then more and more slowly to 186.2°, at which it remained stationary, and during this time about one-fourth had distilled over.

The distillate congealed at 33.3° C. and was very free from creasote odor and very sweet and clean. The residue was not so clean, but still was of good quality, and congealed at 30°. The addition of 2 p. c. of water to the distillate lowered its congealing point to 25.4° C.; and 3 p. c. of water added to the residue kept it liquid down to 15° C. But then a crystal added made it congeal at 18°.

Therefore it must be concluded that both congealing and boiling points as given in the Pharmacopœia are too high, and are unattainable, while these and the odor tests are most easily applied and are sufficient in all ordinary cases.

In determining the boiling point,—which, however, need rarely be done, as it is inferior to the congealing test,—great care must be taken, as both the hot liquid and vapor are very inflammable.

The test given for creasote and cresylic acid is very simple and easy, and appears to be a very good one. Only one out of the three samples to which it was applied gave the characteristic milky turbidity, and this one was known by the odor to be inferior to the others, and only of fair quality. The test is very conveniently applied in a marked test tube, or a graduated cylinder.

The last test given for ascertaining the amount of water contained in a solution of carbolic acid by agitating with an equal volume of chloroform is quite useless, even if chloroform saturated with water be used. It is difficult to see how it can possibly be a test at all, because not only does chloroform dissolve water and have its volume increased thereby to an extent quite appreciable, but water dissolves chloroform to a considerable extent. The solutions of carbolic acid are those wherein the acid dissolves water to the extent of 5 to 6 p. c., and those in which water dissolves the acid to the extent of only about 5 to 7 p. c. The acid will dissolve no more water than this, nor will water dissolve more acid, so that these, or weaker than these, are the only solutions to be tested. Acid saturated with water mixes with an equal volume of chloroform to a transparent mixture without separation, though about 6 p. c. of water has been added to the acid. On the other end water saturated with the acid and containing about 6 p. c. of it, when vigorously shaken with an equal volume of chloroform, remains like a milky emulsion for some time; but when the mixture separates, the volumes are found not perceptibly changed, and the upper watery portion tastes strongly of both carbolic acid and chloroform.

Much carbolic acid, otherwise very good, has an odor of sulphur compounds and such should be rejected. The odor is quite sufficient to detect this, and it should have been mentioned by the Pharmacopœia.

Carbolic acid is an effective antiseptic, disinfectant and deodorizer, but in this pure crystalline condition it is less effective than the impure carbolic acid. It is, however, so much better adapted to many uses, and especially to such uses as antiseptic surgery, that its somewhat inferior powers are more than compensated. It is far less disagreeable in odor and taste,—and indeed when of very good quality is not at all disagreeable to most persons. The odor is also much less persistent, and passes off quite as easily as any of the aromatic series. For internal uses, and for many external uses where irritation is especially to be avoided, the crystals alone should be used, and as these are not nearly so manageable as when in the liquid condition, it has long been a good usage to add a fluidounce of water to each one pound bottle of the crystals, and warm the whole until liquefied. It will then remain liquid, and may for all practical purposes be weighed, dispensed and used as though no water had been added.

Carbolic acid and the other phenols with which it is associated are all very effective local anæsthetics, and this therapeutic relation is far too much overlooked or neglected. A paper by Dr. J. H. Bill, of the U. S. Army, published in the American Journal of Medical Sciences for 1870, page 573, first drew attention strongly to this point, and every one who has handled the acid much has amply confirmed Dr. Bill's experience, and yet the matter has been very imperfectly followed up. Even its application to the pain of burns, erysipelas and other superficial affections, though often insisted upon is not generally adopted, and when adopted it is rarely in the best way. The writer knows from personal experience, and from extensive practice in his laboratory where burns and scalds are not infrequent, that a solution containing from one-half to one p. c. applied by means of thin cloths, frequently renewed, will relieve the pain of burns within ten minutes, and the relief will be permanent if the application be continued during the 24 or 48 hours of primary irritation. Under such dressing the burns if superficial will not suppurate, and if deeper the suppuration will be greatly diminished and modified. If the solution be applied too strong it will at first increase the pain for a very short time, but the after effects are less favorable as the irritation of too much of the acid increases the tendency to suppuration. A simple rule for guidance is that the renewal of the application should not cause smarting or renewal of the pain. The anæsthetic effect upon the acute suffering of burns and scalds is very remarkable.

A 5 p. c. solution of this liquefied acid is a very convenient preparation to keep in readiness for making the more dilute solutions needed for burns, erysipelas, etc., and for such uses as protecting hypodermic solutions. One-twentieth of such a solution is quite sufficient to prevent the growth of micoderms in any preparation which needs protecting. It has simply to be added in making up the preparation to the required measure. A piece of paper moistened with a few drops of such a solution and kept in extract pots, etc., will prevent the growth of mould.

Such a solution diluted so as to be not stronger than one p. c., nor weaker than about a-half of one p. c., makes an excellent tooth and mouth wash for use in the morning. Habitually used, it in some degree checks the deposition of "tartar" on the teeth, keeps the tooth brush sweet and clean, and there is nothing that leaves the mucous surfaces in so clean and pleasant a condition for the first meal of the day. A bottle of the 5 p. c. solution may sit upon the wash-stand, and a couple of teaspoonfuls poured into the mug, diluted with four or five times as much water, stirred with the tooth brush and then used upon the brush,—the mouth being finally rinsed out with the remainder of the dilution,—is a very good habit, which has been followed by the writer and many others for many years with advantage.

For all the ordinary uses of Carbolic Acid as a disinfectant, the next article, or the "Crude Carbolic Acid," is as good or better than the crystals, is much less costly, and is more important because it is so much more largely used.

During the past two years very much has been published by a "Dr. Déclat, of Paris," on the subject of Carbolic Acid or Phenic Acid as he calls it, for the cure of zymotic diseases, among which he classes phthisis, and most irrational statements are made by him and his advocates in regard to its character and uses. Most of his statements are at variance with well established facts, and his deductions from these statements are as inaccurate as they are irrational. He seems to have had quite a successful professional following, notwithstanding such absurd statements as that it is impossible to transport pure carbolic acid. It immediately deteriorates and develops cresylic acid, an active poison. It must be combined in its nascent state,—and so on. The effect of such undertakings as this of Dr. Déclat seems almost incredible.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. JULY, 1883. No. 10.

THE DISCUSSION ON MEDICAL ETHICS.

The New York *Medical Journal* of May 12, 1883, at page 512, contains a very able and temperate communication upon The New York Code of Ethics, by C. B. Higgins, M. D., of Peru, Indiana.

This writer aims to limit himself to " but one of the objections advanced by the opponents of the change," and lays no claim to originality in his position, because the position taken is not new.

He says, " The principal objection urged against the new code is 'that it obliterates the broad distinction which was previously easily recognized between scientific medicine and medical charlatanry.' Were the ignorant and uncultivated alone imposed upon by charlatans, this objection would be insurmountable."

Then he goes on to show that this last proposition not being true, the objection taken for his text falls with it, and he then shows clearly enough that there are a sufficient number of individual examples of highly cultivated minds, at all periods of civilization, which accept charlatanry, to warrant a line of argument in favor of his conclusions that the policy of the new code is wiser and better than that of the old code, and therefore should be generally adopted as the best policy for the interests involved.

As long as this line of argument may be reproduced it cannot be too often reiterated that the issue involved in this controversy is not one of policy but is one of fundamental principle. Had the author of the paper read his text more deeply,—farther beneath the surface,—he would have found it to be the enunciation of a principle and not of a policy. Let the final words of his quoted sentence be read, instead of " between scientific medicine and medical charlatanry," between right and wrong,—between truth and error,—then it will be easily seen that this is an issue upon a principle, and not upon a policy,—that moral rectitude and honor are involved,—and not only involved but constitute the entire basis of defence of the old code. The policy which may be best adapted to conciliate the popular favor of a small class of educated and cultivated individual minds, existing from the time of the Æsculapian priests down to the present, may not be unimportant, but it is entirely subordinate to the principle of right and wrong,—truth and error,—and when such policy subverts and overturns the principle,—or even ignores it,—or slides past it upon the plausibility of superficial and ingenious lines of argument,—then the policy is unsafe and unwise.

This author, in common with many others, therefore simply fails to go deeply enough into the subject to find the underlying basis of the defence of the old code against the attacks of the new. No dispassionate writer on the defence has ever objected to the largest tolerance of individual opinion, and the largest liberty of conscience where individual opinion alone was in question, and the old code has somewhat notoriously leaned away from its perpendicular moral rectitude in favor of this tolerance of individual opinion, and has thus furnished a superficial and plausible argument against its utility by doing so. But tolerance of individual opinion and conviction is a very different thing from the surrender of a principle of general rectitude of purpose and action for a large profession. That profession may be very highly educated and cultivated as a whole, yet in its individuality it must be made up of all shades and degrees of education and cultivation, and of moral sensitiveness to convictions, and therefore the formulation of a general code of principles for guidance and government must be as useful and necessary here as for any other interest of civilization against anarchy and unorganized license. Communities in interest do exist without formulated laws, either moral or statutory, and yet this is not a good argument against a better government through formulated law, because all the best government throughout all time has been through the restraints of formulated law in opposing the license or liberty of individual or minority convictions.

Charlatanry is often placed, as by the author of the paper under review, in the charitably chosen position of honest minority convictions, and as supported by a minority popular favor, and it is proposed upon these grounds as a wise, beneficent and humane policy to obliterate from all record the distinctions or principles which oppose it, and leave them to the misty indistinctness of unformulated and unexpressed individual conviction,—that is to anarchy. This position would be the less objectionable to assume had there never been a code, as in some European countries, where the issues may have possibly been as well settled by peculiar circumstances as in countries which have adopted codes. But for countries which have formulated their principles and adopted them as a code, now to abandon them, not simply by disuse, but by a deliberate act of repeal and revolution, the movement has a bad significance, the effect of which in demoralization it is difficult to over-estimate.

The position is simply this: Many years ago the nation formulated a code by applying the common principles of justice and equity to foster and support a high standard of professional rectitude, and to draw a broad distinction between right and wrong,—truth and error;—and the professional nation has lived under this code for many years. But now it is proposed, by a part of the general profession, not simply to abandon this code, but to repeal it by a deliberate act; or to enact a clause denying a prominent principle and affirming an opposite one. Substituting the rule of individual conviction and judgment for collective judgment, and placing the individual above the restraints of law as the expression of collective wisdom and justice.

Farther, this author says: "Were the ignorant and uncultivated alone imposed upon by charlatans, the objection (to obliterating the broad distinction between scientific medicine and medical charlatanry) would be insurmountable,"—and in saying this he, in one important sense, gives up his case. Those who are imposed upon by charlatanry are all certainly ignorant and uncultivated in the direction of their imposition, for they neither know nor believe that they are imposed upon, nor that those who impose upon them are charlatans, although the evidence of the facts are as open to them as to others, so that whether educated and cultivated or not, in a general sense, they are both ignorant and uncultivated on the special subject upon which they are deceived and duped,—and are willfully ignorant in proportion to their higher and better culture on other subjects, because, the principles of rational medicine are as open to them as any other branch of natural science. No generally educated and cultivated person could be duped upon subjects within the scope of his education and cultivation, and can only be duped through ignorance and want of cultivation. Therefore it is, and can only be, the ignorant and uncultivated who are imposed upon by charlatans, and the objection to the new code is insurmountable.

And farther still, if the distinctions between scientific medicine and medical charlatanry be obliterated by the new code and its registry law, how does this help either those who are duped or those who are not? It merely helps the charlatans by admitting them to a fellowship and recognition in rational medicine, and so far improves their power to impose upon a larger number. The argument so often used, that by obliterating these distinctions the beneficent results of rational medicine are brought within the reach of the suffering dupes of charlatanry, is a plausible one and has become quite popular by reiteration, and by the captivating sentence for the common multitude that "Emergencies may occur in which all restrictions should yield to the demands of humanity," but the argument is unsound and unfair, because throughout all the time of the old code the services of the profession have been freely and liberally accessible to all who were sick or suffering at all times and in all emergencies; and there is no profession nor trade that has ever given more personal service more freely or more liberally than that which has lived so long under the teachings of the old code, and as a rule, those who lived most nearly up to the precepts of the old code have been most fruitful in liberality and humanity, as in beneficent work. That they would not recognize charlatanry on terms of professional equality does not affect the fact that they were, as a profession, always accessible to all who were sick; and the often unquestioning liberality and humanity with which they have always answered to the calls of suffering have given rise to that other specious line of argument which is based on the charge that the warmest supporters of the old code are those who most frequently broke it by heterogeneous consultations that were forbidden, the charge being recklessly indifferent to what may have been the character and circumstances of the meetings with irregulars,—whether they were calls of the sick for help, or calls of the dogmatists for consultations. And as no part of the profession has been more fertile in such good work than those who bring this charge, so none know better that the humanity and liberality which they now invoke for themselves as supporters of the new code, but which they deny to supporters of the old, have always been the chief incentives to action in these meetings, and that when these were the incentives the meetings were visits to the sick in emergency rather than consultations with dissenting and opposing practitioners, and as such were in strict harmony with the entire spirit and teaching of the old code.

It has become very common with the advocates of this movement to call it a revolution, and to predict its success upon the *ad captandum* statement that "revolutions never go backward." This is not argumentative at all. Neither is it a statement of fact, for although very revolutionary in its character as a movement, yet it is not a revolution as yet, and may never be one. Still such high-sounding sentences well used have great popular effect, and many fail to examine their real force and application.

In order to understand the true application of the doubtful statement that "revolutions never go backward," only a very superficial review of history is needed. From such review, it is at once seen that revolutionary movements are rarely called revolutions until they are successful. When successfully resisted, or when they die out, or when not generally accepted, they are not called revolutions, but are simply secessions, rebellions, heresies, schisms, dissensions, etc., and lead to more or less permanent splitting up of society with either a majority or a very large minority against them.

Again, it is not necessary to go very far into history to find revolutions which have not only gone backward, but which have gone back beyond the starting point; and there are many at the present day which are going backward with greater or less speed, so that time, which tries all things, makes no exception of either revolutionary movements or even accomplished revolutions.

Another high sounding sentiment, which has been used with much force as an argument in that section of this divided movement, which is striving to abolish all codes, and relegate the subject of general moral laws to the control of individual convictions,—which is a very decided case of striving to make a revolution go backward, —deserves attention, and may be given in substance as the prominent text of a paper, which has been widely circulated and quoted.* The substance of the statement alluded to as taken from different parts of this paper, and put together here in the author's words, is the claim for his movement of the right of "each man in

* See pamphlet reprint from The New York *Medical Journal* of April 21, 1883, on "The Necessity for a Code of Medical Ethics, by D. B. St. John Roosa, M. D., LL. D."

the possession of knowledge to give it freely whenever it is honestly asked," and "wherever it may do good." And the writer of the paper says: "We cannot see how discussion is possible over such a self-evident right."

The self-evident right here claimed has never been doubted, nor discussed; and why it should be so earnestly and laboriously claimed and advocated when it has never been disputed nor denied, can only be understood on the ground that those who now use it, after having lived by it for so many years, have understood it so imperfectly and so superficially that they now seek to misapply it, or to apply it in a new sense.

No profession, nor any class of men, have ever given their knowledge more freely or more fully, whether honestly asked for or not, than the medical profession,—and of that profession none more freely or more fully than the prominent leaders of this movement, in common with most other prominent medical men, or those who possess most knowledge to give. No considerable minority of this profession has ever habitually or ever indirectly disregarded or refused the calls of the sick and suffering, or failed of prompt response to all the emergencies of disease and accident, and therefore there is no moral issue upon which to raise a discussion on an unquestioned inherent right that has always been exercised; and it is a most unjust imputation on a liberal and self-sacrificing profession for a part of it to try to raise such an issue by which it is made to appear that any other part of the profession is seeking to abridge any such rights. The claim as made is, then, what is already possessed by all,—the right to give professional knowledge and skill to all who seek it, even irrespective of whether it does good or not. And this is equally true for all professions and all classes who have attained superior knowledge or skill of any kind. But it is far from being equally imposed as a duty to do so upon all professions and classes alike, for it is only where human suffering comes into the question that any moral obligation arises. The question of illiberality or liberality applies to all alike, including the medical profession, and the sentiment or idea involved is one more of policy than of moral principle, and therefore one that may be safely and justly left to individual action. But the question of inhumanity or humanity is one that affects only the peculiar knowledge and skill of the medical profession; and separates this profession from all other branches of human knowledge by a very broad distinction. To refuse to give knowledge and skill that may mitigate human suffering is inhuman and morally wrong and bad, and it has never been taught by the old code nor practiced by its adherents any more than by the adherents of the new, or of no code; and therefore in order to understand this claim now made with such a parade of liberality and humanity it may be well to see how it would look when a single word of the formulated claim is changed, ignoring the broad distinction which characterizes the medical profession whose knowledge and skill deals with the issues of human life and suffering, but yet keeping it fairly classed with all other professions which acquire by similar processes superior knowledge and skill with a view to offering such acquirements to the public. Suppose then the formula be read as follows,—just as a lawyer or civil engineer would be justly and morally entitled to put it and to practice it,—"We claim the right of each man in the possession of knowledge to *sell* it freely whenever it is honestly asked, and wherever it may do good."

For example, the gynæcologist has an undoubted right to interrupt gestation and to receive pay for his knowledge and skill. Has he therefore also the right to become an abortionist subject only to his own individual convictions in the application of his knowledge?

Every medical man can now see how it applies, and where it leads, and can judge of it for himself. This latter is the claim which has always been denied and refused by the old code of ethics, but denied only to the regular medical profession, and not at all to any other branch of human knowledge or skill.

Now the no code party, by claiming a right which has never been questioned, and has always been freely exercised, puts itself logically in the position of either wanting to make capital out of nothing, or of wanting something that it does not claim; and the former is much the more probable deduction.

As for the necessity or no necessity for a code of ethics, one of the ablest advocates of no code, when using his ability in another direction (see an editorial in The New York *Medical Journal* of June 16, 1883, p. 656), says: "A man responsible to himself is not responsible at all." This broad truth is the very basis of all political and social organization, and this it is which makes it necessary that men should band themselves together, and make laws and codes by which the individual must be held responsible,—not to himself, but to organic laws made for him by the organizations of society.

In view of the long and well-established liberality and humanity of the medical profession, and its history of unpaid services in hospitals, dispensaries and private practice, where the best knowledge and skill of its best men have always been given freely to all who are in need, the following paragraphs from the editorial columns of the New York *Evening Post* of June 25, 1883, are very injurious and unjust.

A broad caricature recently published in *Puck* conveys this same injurious inference, and may be intended to illustrate this same sensational story with the same object of degrading the regular medical profession by coarse ridicule. Being a caricature picture it is free from the positive misstatements of the newspapers; but inspired by the same idea, it means the same thing, and is equally wanting in truthfulness.

"A striking practical commentary on the medical code has been furnished by an incident said to have occurred in Wisconsin. A little girl was thrown from a carriage and her skull fractured. A 'regular' physician was called in, but when the family doctor, who was a homœopath, came, the allopath conscientiously refused to consult with him. The case needed surgical care, which the allopath could give and the homœopath could not. The regular physician, however, pointed out that under the code he would have to leave the child to die, and went away; and the child would have died but for the appearance of a surgeon from Chicago. The story is difficult to believe, because, unless we are greatly mistaken, the code, or the practice under it, allows physicians to make an exception in critical cases involving safety to life. But if there is any reason for the existence of the code, the conscientious adhesion to the spirit of it by the Wisconsin doctor is very praiseworthy, for critical cases are just those in which it ought to be obeyed most implicitly."

"The *Herald* suggests that the Wisconsin physician, if the child had died, might have been indicted for manslaughter. But what of that? The physicians have never pretended that the code was devised in the interest of patients, but represent it as having an ethical origin, or as a part of the professional moral law. If they are right, a conscientious "regular" ought to be willing to stand a trial for manslaughter, or even murder, for its sake. A physician who once undertakes to discriminate between cases in which he will apply the code and cases in which he will not, on such a flimsy pretext as the safety of the life of the patient, might just as well do it on the score of mere health, and then we are all at sea again. The only way is for conscientious believers in the code to stick to it, no matter what becomes of the patient. It may be necessary to indict them for doing so; but what really good man will violate a principle for fear of the consequences?"

This story is so out of harmony with the long-established character and practice of the medical profession, and is so indefinite in regard to locality and other detail as to render it very improbable, while it is so given as to forestall and prevent any efforts to disprove it. If true, however, either literally or in spirit, it is only one of a few individual instances where personal conviction overrides the whole spirit and tone of the old code, and such instances are overbalanced by long years of contrary practice and experience in a large profession with a public record, though it be a professional record not advertised in the newspapers. But the subject is brought here mainly to ask who inspires these *ad captandum* newspaper articles that are so common since this discussion began. The old code party does not inspire them, since not a single paragraph has been seen by this writer which either illustrates or defends its true position in the matter. The new code party ought to be equally free from the charge of inspiring them, because the new code, equally with the old, proscribes newspaper notoriety in matters affecting professional relations of a private character and bearing, which the lay reader does not easily nor generally understand. Yet many, if not most, of the newspaper articles defend the new code in such a way as to indicate professional prompting, and that only on one side of the discussion.

The no code party is, however, at least half way committed to the use of newspapers in professional matters, as shown by the following quotations from the pamphlet above referred to.

"We are not willing, however, to admit that advertisement of skill, holding patent rights of surgical instruments, consultations with men who have not the correct views of therapeutics, are crimes, although some of these acts may be breaches of good taste." Again in criticising the new code, "This is the one which says that it is derogatory to the dignity of the profession to allow our opinions on medical and surgical questions to appear in the newspapers. Now this may be true, or it may not. In times of epidemics even the publication of a formula for the relief of cholera morbus would certainly be of value to the profession, as it has been in the past, even if it contain an opinion on a medical subject. While it is, no doubt, a good general rule that the newspaper is not the place for medical and surgical opinions, there are many times when this avenue to information becomes just the means of humanely serving the public. This, as well as the subsequent clause, as regards giving certificates, could safely be left to the good judgment of the profession."

If it be a fair inference from this that the no code party is in favor of using the newspapers upon professional questions, subject only to individual conviction and responsibility, then this party is so far on a common basis with the advertising charlatans and the patent medicine interest, and the remainder of the profession is opposed to it. And if this inference be fair, then it seems equally fair to charge this party with using the newspapers upon this question, and of inspiring the newspaper stories like the above which are uniformly in favor of this party, or of the new code party, as far as the new consultation clause goes,—this being really a no code clause.

Then it follows that any party that will use the newspapers, and can see no great objection to their use in professional matters, subject only to individual convictions as to the good or bad taste in so doing, will pretty surely secure their aid and support against a party who will not so use them, for the newspapers can see no reason why professional men should not advertise as other tradesmen do, when advertising is so lucrative both to the tradesmen and the newspapers.

What is a consultation? Everybody knows what a consultation is, and talks freely about it, yet it is exceedingly doubtful whether the word conveys anything like the same idea to all. Indeed, this discussion has shown that there are many very different constructions given to the word, and that it may be useful even now to try to get some definite idea of what does and what does not constitute a consultation. Dunglison says: "Consultation * * * 'to hold council.' This word has several acceptations. In English it means, almost always, the meeting of two or more practitioners to deliberate on any particular case of disease."

This is a question, so far as the discussion of its ethical relations goes, which involves simple honesty and morality. Those who discuss it need not be active practitioners of medicine. Any person with medical education enough to comprehend the proper application of rules of common honesty and morality to the special conditions and principles of medicine must be held competent for its discussion.

To hold council there must not only be a common object, but there must be a subject in common, and a common principle of action on which the deliberations are to be based. A proper and useful medical council deliberates, not upon the principles of practice, for these are established as a uniform basis for council, but only upon the details of their application to a special case under consideration. The moment adverse or contrary principles of action are associated, it ceases to be a council, and becomes either a conflicting controversy or a sham, and the object,—namely, the patient,—can be in no way benefited by controversy upon basement principles, nor by shams. Consultations which are asked for under circumstances of opposite and antagonistic principles of action, if demanded by the patient or his friends, are sought under the grave misapprehension that the differences between regular and irregular practitioners are not differences of principle and of basis of action, but merely differences of opinion and of skill. The popular idea that the practice of medicine is wholly empirical, and entirely the result of experimental trials of one means after another until the right thing is hit upon to cure disease, and that trying one physician after another is only like trying one medicine after another, with the exception that when physicians get together over a given case they simply get the advantage of each other's accumulated trials to know what to try and what not to try. It is hardly to be wondered at that this misapprehension and want of intelligence should be easily aroused to clamor for the association of incompatible agencies so as to increase the number of the mere chances to be benefited.

If consultations be sought by either the regular or irregular practitioner, it can be under no such misapprehension. Both know the antagonism of principle of action which exists between them, and each thinks the principle of the other false and wrong, and each knows that one of them must abandon his principles before the object of the consultation can be attained, if that object be the benefit of the patient. In order to determine which shall abandon his principle a controversy must be had by which one or the other is to be converted. Thus the so-called consultation is in reality a missionary scheme for proselyting one or the other consultant.

Under any other view than this the consultation is a hurtful sham. Hurtful to the patient, hurtful to the cause of common honesty and truthfulness, and hurtful to the physicians themselves in every way save as a business operation for pecuniary gain. This later consideration is certainly a dangerous element in legislating for incompatible consultations. Although it may be entirely out of the question at first, for it is undoubtedly a side issue now, yet it will as surely come into the question, first as an unrecognized motive, and next as a rule of practice,—as that human nature is weak and fallible, and individual conviction not to be trusted. A consultation, then, being to hold council, and council being a deliberation on the details of the application of established and known principles to individual cases of doubt, difficulty and danger, it may be useful to ask what is not a consultation ? and answer the question upon the above mentioned considerations.

Is the meeting together of antagonistic principles and practices in times of emergency or danger a consultation ? Humanity, reason and the daily practice of the profession in all past time answers that it is not a consultation. But as soon as the emergency is past any fellowship and joint action in management of the case is consultation, and as it cannot be either honest to the consultants or beneficial to the patients, it is forbidden in order that antagonistic councils be broken up for the benefit of the patient, and that shams be avoided. One or the other principle of action being right, but not by any possibility both, the law of the general profession steps in and gives free choice to the patient and friends, but simply tells them they cannot have both, and tells them that the plain reason is that only one plan of treatment can possibly be right or be beneficial.

If a surgeon or other specialist be sent for by a patient or by an irregular physician, and treats any special case by his own skill and principles and judgment,—no matter whether the irregular continues to see the patient or not,—is that a consultation ? Certainly not, for there is no council held, and no violation of principle, but on the other hand there is a triumph of principle against which want of principle cannot long stand, for honesty, truth, justice and humanity all underlie and support such action, and therefore the old code supports it.

Is a practitioner when summoned, whether in emergency or not, to stop to inquire who he is to meet at the bedside in order to avoid heterogeneous consultations as if he were mortally afraid of them ? Certainly not, since even the meeting with irregulars does not constitute consultation with them ; and if he meets them and does his best for the patient, without admitting professional fellowship, and without holding council, or permitting the appearance of holding council, and holding out to the patient a free choice as to whom he will choose to conduct his case, and stating the plain reason why he cannot have both, there is no consultation and no conflict with the old code of ethics.

If a physician be sent for to meet one or more irregular practitioners in consultation upon a difficult or critical case, must he decline the meeting? Certainly not. He *may* go. And perhaps if his sense of moral rectitude and justice be very high he may decide that he *must* go. But he will most certainly decline consultation when he gets to the meeting. He will make clear his readiness to see the patient if that be desired, and to do the very best he can for him; but he will distinctly decline to do this jointly with those whose avowed or tacit principles of action are so antagonistic to his that one side only can be the right. If the patient or friends insist in the name of humanity, and for the sake of a beloved child or relative that he should remain in joint management, and assist by his counsel and experience, is he then justified in such consultation? No; for if he cannot make the patient and friends understand that the presence of either the regular or the irregular practitioner must, in the nature of cause and effect, be detrimental to the interests of the patient, then he must withdraw by the force of his own principles of probity and honor, and submit to popular adverse criticism, and even newspaper misconstruction and abuse, if need be. But first he will earnestly strive to convince the patient that either course of treatment is surely better for him than any admixture of incompatibles.

If at the request of a patient or friends a regular practitioner takes charge of a case, and an irregular practitioner is, by the family, retained in attendance, even if visiting the patient at the same hours, or present at the treatment, is this a consultation? Not if there be no holding council to deliberate upon the case,—no acknowledgment of a joint responsibility, no admission to professional fellowship and equality, nor any admixture of treatment. The irregular is then not a consultant, but a spectator, or may even be a nurse.

The line is not difficult to draw in any of these cases, and although it will not be exactly the same line as drawn by different individuals and under different circumstances, yet it will always be coincident in effect if drawn in obedience to the plain rules of honor and honesty and the plain meaning of words. And if it be carefully drawn with that unselfishness which first thinks of the feelings of others, it will always be done with politeness and courtesy.

This attempt to get a definite idea of what a consultation is, and what is probably meant by it, in the Code of Ethics of The American Medical Association, as applicable to the present day, is of course in no way authoritative. It is simply the effort of a single individual to get at the true meaning of the word, and apply to it the principles of common honesty and morality, as every individual has a right to do; and which in times of controversy may become a kind of duty. It is claimed that the application is accurate and logical and not illiberal, but of this each reader must judge. It is also claimed that it has been, and is, substantially, a mere formulation of the practice of the intelligent masses of the profession as they have lived by and practiced the old code, the examples of intolerance and bigotry so often quoted being exceptional cases of individual construction of the code, and of the same kind of individual conviction claimed by the no code party.

The attitude taken by The American Medical Association and The American Surgical Association on this subject has been abusively condemned by the newspapers and by a few medical journals, and unfortunately in some of the most intemperate of this abuse, there are signs that the articles were inspired by medical men. The answer to this wholesale condemnation is easily reached. A large majority in both these Associations was opposed to both branches of this new movement, and this sentiment was that of nearly the whole of the nation as represented in the Associations, and this after more than a year's agitation of the subject throughout the land. Every one has had abundant experience of how long and how well the advocates of the two sides of such a controversy can write and talk, and that if the subject was allowed to come up it would have occupied much time with the well-known definite result of a defeat of the new movement in every form whenever a vote might be reached,—to say nothing of the broad field for parliamentary tactics by which an adverse vote would have been prevented if possible. The only wise course open to the Associations under these circumstances was to keep all those out of the meetings who had voluntarily, by their own deliberate acts, separated themselves from the Associations by openly disavowing and trying to defeat the laws of organic compact, and who, if admitted, would surely bring dissension and hot blood. The course taken was not only just and right, but was self-evidently the only wise course that could be adopted.

Suppose for a moment that instead of the abolition of the Code of Ethics,—the real bond which holds the Associations together,—the proposition was to disband the Associations, and suppose the same intense energy and warmth was possible upon such a proposition, and the same large majority against it all over the land, would it have been either wise or profitable to have wasted time upon an interminable and hotly-contested controversy with the well-known result of damaging and weakening professional and personal good fellowship throughout the land? The greatest harm of this controversy over medical ethics,—although by no means all the harm,—is as yet limited to a single State. Was it not thoroughly rational and proper then for these Associations to say in effect: "We are tired of this subject, and warned by the intemperate zeal with which it has been pushed to the overwhelming of majorities by doubtful tactics and injurious epithets, we will not admit it, and will take carefully considered measures to keep it out. If these measures be unusual and arbitrary, it is only because circumstances have shown that nothing short of arbitrary measures will be effectual." The result showed that even the measures adopted were not entirely successful, since some members, having complied with the terms of admission under mental protest, did succeed in showing their sentiments on the adverse side of the subject, and had to be controlled in a still more arbitrary and objectionable way. Such are now on parade as martyrs, or are wandering through laborious explanations.

THE PHARMACOPŒIA OF 1880.

(Review continued.)

CARBOLIC ACID.

CRYSTALLIZED PHENOL.

In the hurry of getting the last pamphlet ready for the printer the note on the solubility determinations was accidentally omitted, and the solubility of water in Crystallized Carbolic Acid being so very different from the description of the Pharmacopœia, the subject has been gone over with care.

The Pharmacopœia says "100 parts of the crystals are liquefied by the addition of about 5 parts of water; this liquid is rendered turbid by the further addition of water until 2,000 parts have been added, when a stable and clear solution is formed." This is equivalent to saying that the crystallized acid will dissolve only about 5 p. c. of water, and that water will dissolve only about 5 p. c. of the acid, and that all the proportions between these points are turbid mechanical mixtures or emulsions. This description is in more or less general accord with the older and some recent authorities, but it applies only to mixtures of phenols, and these mixtures have of late years been separated, and have been found to differ widely in many respects. That is, the phenols are now found to be as different from each other as are the alcohols, and the phenol which is written with a capital P., namely, this Crystallized Carbolic Acid, is as different from other phenols of the class as is common ethylic alcohol from others of the class of alcohols. Some modern authorities are more accurate in their descriptions of Carbolic Acid, and it is unfortunate that the Pharmacopœia did not follow these. For example, the Pharmacopœia says that Crystallized Carbolic Acid dissolves about 5 p. c. of water, while Allen,—"Commercial Organic Analysis," Phila., 1879, p. 303,—states that it dissolves about 27 p. c.

Repeated trials with a Commercial Carbolic Acid free from creasote odor, which congealed at 38° C.=100.4° F., gave results as follows :

To 100 c.c. of the melted crystals warm distilled water was added, 10 c.c. at a time, the solution being kept at about 54° C.=129.2° F.,—until 60 c.c. of water was dissolved, making a perfectly transparent solution as long as the temperature was maintained at about that point. But on cooling a few degrees the whole became an opaque white emulsion. This on standing 48 hours separated into a transparent lower portion measuring 135 c.c. and an upper stratum of 25 c.c. The upper part of this stratum, measuring about 15 c.c., was a perfectly transparent watery solution, saturated of course ; the intervening portion of 10 c.c. was a white emulsion containing a very little very finely divided acid, suspended in minute cells in the watery solution. Thus this acid had dissolved not less than 35 c.c. of water and held it in perfect solution at 20° C.=68° F., while by the Pharmacopœia it should only have dissolved about 5 c.c. The solution contained nearly 26 p. c. of water and was saturated. Of the same acid, melted, 10 c.c. were well shaken with 90 c.c. warm water, and nearly, but not quite, all dissolved. On standing 48 hours the lower undissolved stratum measured 4 c.c., 6 c.c. having been held in solution in 96 c.c. of the solution, or about 6 p. c., 5 p. c. being the solubility given by the Pharmacopœia.

In a re-examination of the chloroform test for solutions, it was found that there were conditions under which the indications were somewhat approximative, though not near enough to be useful.

When a saturated solution of the crystals containing 6 p. c. was carefully poured upon an equal volume of purified chloroform in a graduated cylinder, and the mixture was carefully moved to and fro in the cylinder without active agitation, and without making a white emulsion, as by very active agitation,—the volume of the chloroform layer was increased very nearly 5 p. c. That is to say, chloroform is not as easily dissolved by water as Carbolic Acid is by chloroform, and therefore by care most of the acid can be dissolved out of the water without permitting the chloroform to take up much of the water, or the water much of the chloroform. All ordinary chloroform contains a small proportion of alcohol, and this is washed out by brisk agitation with water, and increases the solubility of chlorform in the water. Under these conditions the test must be inaccurate unless the chloroform dissolves the same proportion of water that the water does of chloroform, and this is not the case at the point of saturation at ordinary temperatures. Beside, when any solution of Carbolic Acid has been shaken with chloroform, the watery stratum smells and tastes strongly of both chloroform and Carbolic Acid.

When 50 c c. of crystals saturated with water, and containing 27.18 p. c. of water, were shaken with 50 c.c. of chloroform, either with or without active agitation, the upper watery layer measured 10 c.c., indicating 20 p. c. of water when the solution contained 27.18 p. c. of water in addition to the 1 or 2 p. c. of water that the crystals originally contained.

Thus the chloroform test rigidly re-applied to a saturated solution of Carbolic Acid in water did not indicate the acid known to be present by 16 p. c., for the water actually contained 6 p. c., while the test indicated only 5 p. c.

Applied to Carbolic Acid congealing at 38° C., saturated with water and known to contain 27.18 p. c. of water, the test indicated only 20 p. c., or say 73.5 p. c. of the water actually present. Hence the general statement that the chloroform test for solutions is practically valueless is sustained.

Some very good authorities state that benzene will wash all the Carbolic Acid out of its solutions, and leave the water to be measured. But such is not the case with any benzene that is commonly accessible.

The quantity of Carbolic Acid dissolved in any given solution may be roughly got at by adding 6 c.c. of melted crystals to 94 c.c. of the solution in a 100 c.c. graduated cylinder, warming the mixture, shaking vigorously, and then allowing it to separate. When cold the solution is now fully saturated at the temperature of the observation, and the undissolved excess may be read off. If 2 c.c. of the 6 shall have been dissolved, then the solution already contained about 4 p. c., since a saturated solution at ordinary temperatures contains about 6 p. c.

For water dissolved in Carbolic Acid the congealing point is a sufficient indication, but the points given in the Pharmacopœia, namely, 36° to 42° C., are too rigorous, since the very best acid attainable will rarely reach 39.5°, whilst some excellent specimens in every respect will not reach 36° C. It would have been better to have given the congealing point at 35° to 38° C.

ACIDUM CARBOLICUM CRUDUM.

CRUDE CARBOLIC ACID.

A liquid obtained during the distillation of coal-tar between the temperatures of 170° and 190° C. (338° and 374° F.), and containing Carbolic and Cresylic Acids in variable proportions, together with other substances.

A nearly colorless or reddish-brown liquid of a strongly empyreumatic and disagreeable odor; having a benumbing, blanching and caustic effect on the skin or mucous membrane, and a neutral reaction. Bromine water produces, in an aqueous solution of Carbolic or Cresylic Acid, a white flocculent precipitate. Crude Carbolic Acid should not dissolve in less than 15 parts of water, at 15° C. (59° F.), nor should the solution have an alkaline reaction (abs. of alkalies).

If 50 volumes of Crude Carbolic Acid be diluted with warm water to measure 1,000 volumes, the mixture well shaken, cooled, and allowed to separate, the amount of undissolved impurities should not exceed 5 volumes, or 10 per cent. by volume of the Crude Acid.

The amount of water in a solution of Crude Carbolic Acid may be determined by agitating the solution, in a graduated cylinder, with an equal volume of chloroform. After standing, the upper layer consists of the water contained in the mixture.

The grade of Carbolic Acid here intended is perhaps of more importance than the Crystallized Acid, because it is so much more largely and more frequently used for disinfectant purposes, and it is so liable to be of poor quality. The very large quantities of this which are used, make a full and careful consideration of it important.

This is often called Liquid Carbolic Acid, and sometimes very badly miscalled Solution of Carbolic Acid.

This is practically the same substance as that called in the former revision, "Acidum Carbolicum Impurum," and why the name is changed the writer does not know, but the change does not seem to be a good one. In these days when so many things are called pure when they are not so, and when the term "chemically pure," or "C. P.," has lost all signification as commonly applied, there are popular objections to the word impure in a pharmacopœial title, but there are still greater objections to the word crude when the substance is not crude in any good or accurate sense, but is really an impure product of the same process of manufacture which yields the purer product, from which it is to be discriminated. Beside, the article very commonly known as Crude Carbolic Acid in the markets is a very different substance and will never answer the description and tests, nor serve the purposes of this substance. Crude Carbolic Acid is the distillate from "Dead Oil," and has been so long and so much dealt in that it has become a tolerably definite article under this name, and it is the crude material from which both the crystallized carbolic acid and this one of the Pharmacopœia are obtained as fractions by a process of fractional distillation. This is, therefore, simply a less pure stage or condition of this group of phenols, applicable to a special class of uses, and if not well characterized by the title "impure," yet this title was established by ten years' usage, and is more true and accurate than the new one, whilst by assuming the name "crude" the Pharmacopœia at once confuses it with a very different substance already well known.

The chief difference in the market will be that the regular crude carbolic acid of the market is sold by the gallon, while this is sold by the pound, and the best that can be done now is to designate this officinal article as Crude Carbolic Acid, U. S. P.

The definition which follows the title is also open to objections by reason of both inaccuracy and insufficiency. In the first place, it is never "obtained during the distillation of coal-tar" in any direct or moderately accurate sense, but from the product of a distillation of coal-tar, which product has been submitted to very important intermediate processes, and the temperatures given are more faulty than those of Carbolic Acid in the preceding article. Carbolic Acid is there defined as "A product of the distillation of coal-tar between the temperatures of 180° and 190° C. (356° and 374° F.)" Crude Carbolic Acid is here defined as obtained "between the temperatures of 170° and 190° C. (338° and 374° F.)"

When "Dead Oil" or other fractions of the coal-tar distiller are again distilled, the product or distillate is Crude Carbolic Acid of varying richness in the phenol series. When the crude Carbolic Acid is again distilled the first distillate is water containing the lighter substances of the aromatic series, and by the time these are off, the thermometer in the vapor before condensation will indicate about 165° to 170° C. when the distillate will be transparent and colorless. The fraction of distillate obtained from this up to about 185° C. will crystallize and will contain nearly all, or at least a very large proportion of the crystallizable Carbolic Acid or Phenol. The next fraction coming over between 185° and 195° C. will not crystallize, but will still contain some crystallizable Carbolic Acid, and much Cresylic Acid and other phenols. A third fraction coming over from 195° to 205° C. will contain no crystallizable Phenol or Carbolic Acid, but will consist mainly of cresol, xylol and other phenols of higher boiling points. From the first distillate by fractioning and other management, the crystallized Carbolic Acid of the Pharmacopœia is obtained, and the second distillate together with the uncrystallizable drainings and residues from the first, properly constitutes this impure Carbolic Acid of the revision of 1870, which is now in the revision of 1880, called Crude Carbolic Acid. The second and third fractions together are commonly and properly known as Coal-tar Creasote, and are largely used for such purposes as creasoting wood for block pavements and other similar uses. But for many antiseptic and disinfecting purposes it is advantageous to separate them, because they are each then better adapted to special uses. The second fraction has been long in the market as Impure Carbolic Acid, No. 1, and is now identical with this Crude Carbolic Acid, U. S. P., and the third fraction as Impure Carbolic Acid, No. 2. Both are cheap and effective antiseptics and disinfectants,—much more effective than the Crystallized Phenol or Carbolic Acid,—but having a very disagreeable, persistent creasote odor, and being very caustic and irritant they are only applicable to rougher and coarser uses.

Carbolic Acid of the Pharmacopœia is therefore one of the products of the distillation of crude carbolic acid between the temperatures of 170° and 185° C. (338° and 365° F.), separated and purified by repeated crystallization. And Crude Carbolic Acid, U. S. P., is a liquid mixture of different phenols in varying proportion the product of the distillation of crude carbolic acid between the temperatures of 185° and 195° C. (365° and 383° F.).

Some such definitions would better designate the character of the two substances, leaving the quality to be guarded by the description and tests, which follow in the smaller type.

This Crude Carbolic Acid, U. S. P., when first distilled is always colorless, and acquires the reddish-brown color by age and exposure to light, and the rate at which it acquires color is very different in different specimens, and is of but little consequence. As a practical result of this, it is rarely found twice of the same shade of color, and may vary from colorless to a very dark-brown. It is singular that in describing this coal-tar creasote as "of a strongly empyreumatic and disagreeable odor," the Pharmacopœia does not add "creasote-like odor," because it is very much like creasote, and characteristically so,—but describes the odor of the crystallized Carbolic Acid as "resembling creasote," when this latter should be free from that odor.

The admixture of even small quantities of alkali renders these impure carbolic acids much more soluble in water, so that they are then easily diluted to any desired extent with water, and Boards of Health and other large buyers are often deceived in the liquids and powders they buy for disinfectant purposes, by such dilutions. The Pharmacopœia tests of solubility and alkaline reaction are intended to detect such frauds, and they are quite sufficient. When the absence of alkali is proven by these tests, then there is no more simple, more easily applied, nor more practically sufficient test of the quality than solubility in water. All these phenols are soluble in water, but the oils with which they are naturally or artifically mixed are nearly insoluble, and hence all the useful phenols can be washed out of the oils by proper management, and then by measuring the residue which remains undissolved and subtracting it from the quantity originally taken for the test, the percentage of the useful phenols present in the sample is approximatively reached. The Pharmacopœia says : "If 50 volumes of Crude Carbolic Acid be diluted with warm water to measure 1,000 volumes, the mixture well shaken, cooled and allowed to separate, the amount of undissolved impurities should not exceed 5 volumes, or 10 per cent. by volume of the Crude Acid." This test as it stands is impracticable for the substance as commonly met with, but with modification is entirely sufficient. As it stands, it will reject all samples which are not mainly composed of the most soluble crystallizable Phenol ; and as in all the recent processes of working this crystallizable carbolic acid is taken out to sell at the higher price, and the liquid left to consist of the less soluble phenols, the cresol, xylol, etc.,—and as these are really the most valuable as disinfectants, the test which excludes them is very objectionable. Some five or ten years ago when the liquid consisted chiefly of the more soluble phenols, the test was quite applicable as given. A sample known to contain 96 p. c. of the less soluble phenols aimed at by the Pharmacopœia was repeatedly and carefully submitted to this test, and never came within 16 p. c. of the requirements of the test. That is, a sample which was known to contain 96 p. c. of soluble phenols only tested about 75 p. c. The same sample tested by the same test but with different detail gave a full account of all the soluble phenols present. The 20 p. c. of "undissolved impurities" rejected by the critical application of the officinal test were found to be not impurities at all, but simply undissolved phenols, which were quite soluble in an additional 500 volumes of cold water. Therefore, the chief modification required by this test is that the separated undissolved residue should be again shaken with half the original quantity of water, and be then measured. But the test is very properly intended to reject any carbolic acid which does not contain 90 p. c. of soluble, useful phenols, and therefore leaves a small residue which does not separate perfectly nor easily, but often remains suspended in the water for a long time as a kind of emulsion. That is, the oily insoluble particles are so finely divided by the very vigorous shaking required, and are so nearly of the same specific gravity as the watery solution, that they do not easily subside and separate so as to be measured. If the solution be poured upon a double wet filter the oily particles may be kept in the filter, while the solution passes through transparent, but the latter part of the filtration is very slow and tedious, and at best the oily particles do not coalesce well for measurement when the point of the filter is broken over the measuring cylinder. A method, which seems to have been first proposed and used by Dr. C. F. Chandler, of adding a known proportion of some fixed oil to the sample to be washed, in some cases diminishes this difficulty by dissolving the residue, and causing it to separate better and more quickly. It is, however, not generally needed, and when needed is not always successful, simple water being generally sufficient for the rough approximative estimation aimed at by the Pharmacopœia. Warm water is directed, but is not only unnecessary, but has the disadvantage of dissolving more of the useless oils, and requires a longer time to cool and separate. To be effective the test must be modified as follows: Mix together 50 volumes of the Crude Carbolic Acid, U. S. P., with

1,000 volumes of water in a vessel of the capacity of 2,000 volumes, and shake the mixture very actively. Then allow it to separate, pour off the upper milky liquid, and add 500 volumes more of water to the residue and again shake vigorously and set aside to separate. Again pour off the watery liquid, and transfer the residue to a measuring cylinder. The undissolved residue from impure carbolic acid No. 1 should not measure more than 5 volumes, or from No. 2 more than 18 volumes. And from the crude carbolic acids of the market not over 25 volumes. This gives for the officinal Crude Carbolic Acid not less than 90 p. c., and generally it will yield 94 p. c. For the No. 2 or coal-tar creasote about 64 p. c., and for the crude carbolic acid of the market not less than 50 p. c. Ordinary "Dead Oil" varies from 8 to 20 p. c. of phenols, which are washed out in this way. The shaking cannot be well done in a bottle that is much more than half full.

The time required for the residue to settle out or separate varies very much in different samples, but ordinarily 3 or 4 hours is sufficient, but the separation is never complete, the watery solution remaining opalescent or milky for weeks or even months. If the solution be poured off through a double wet filter it will pass through clear, but the amount left on the filter is generally too small to be collected and measured, and therefore may be disregarded in a rough approximative test like this. The second washing is done in the same way, and the water can be easily poured off closely enough to get the remainder of the water and the residue into a measuring cylinder, where in an hour or two it will separate so as to be read,—not sharply perhaps,—but with useful accuracy.

When standing to separate, drops of the oily residue will often be found floating on the surface. These should be jolted down by agitating the surface a little from time to time, and knocking or jolting the bottom of the bottle on the table till they disappear. In samples which leave a larger residue than 25 p. c. a third washing will farther reduce the residue and give more accurate results, but in such if washed more than three times the indication will be too high, because so much of the insoluble finely divided oils are poured off with the water. Occasional samples give a milkiness that is almost as dense and white as milk, and which do not separate well with any reasonable length of standing, and it is in some of these cases that the use of a measured quantity of some fixed oil is useful in the agitation, by picking up the minute globules of the emulsions so that they can be measured with the oil.

In other cases a dense solution of common salt for the washing will be successful when oil is not. That is, if the liquid in which the minute globules float suspended be made dense they will rise to the surface by difference in specific gravity, and may then be separated and be made to coalesce by a small portion of ether.

Of this Crude Carbolic Acid, U. S. P., known to contain 96 p. c. of useful soluble phenols, 25 c. c. was agitated well with 225 c. c. of warm water and allowed to cool and separate. The undissolved portion measured 18 c.c., and therefore 7 c.c. were dissolved, making the solution measure 232 c.c. This solution saturated at ordinary temperatures therefore contained just 3 p.c. of the acid. The Pharmacopœia says it "should not dissolve in less than 15 parts of water at 15° C. (59° F.)," indicating a solubility of 6.66 p.c. But the above indication is less than half that proportion for an article of known good quality.

Taking 100 c.c. of the acid and 60 c.c. water, warming the mixture to 75° C. and shaking vigorously, about 45 c.c. of the water was dissolved by the acid, and held in transparent solution at this temperature. But on cooling to ordinary temperatures the acid and dissolved water measured 122 c.c, and the watery stratum 38 c.c. The solution of water in the acid therefore contained 18 p. c. of water, at ordinary temperatures.

An impure Carbolic Acid or Coal-tar Creasote, "No. 2," or the fraction which distills over at about 195° to 205° C., after the two officinal fractions have been taken off, was also examined for solubility, 20 c.c., well shaken with 180 c.c. warm water and allowed to separate, left 16 c.c. undissolved. The 184 c.c. of solution therefore contained 4 c.c. of the phenols, or 2.17 p. c.

Then 90 c.c. of the No. 2 Acid, warmed and shaken with 20 c.c. of water, and allowed to separate, gave 100 c.c. of solution and 10 c.c. of water undissolved. The solution therefore contained 10 p. c. of water.

The Crude Carbolic Acid, U. S. P., as well as this No. 2, always has a slight odor of sulphur compounds, and this does not interfere with their utility, and was not sufficiently objectionable to be noticed by the Pharmacopœia. But when this odor is strong it makes the carbolic acid much more disagreeable, and for this reason is objectionable. Dr. E. Waller, of New York, who is the author of an important Report on Disinfectants, in the Proceedings of The American Public Health Association, for 1874, says these sulphur compounds sometimes amount to 0.24 to 0.28 p. c.

As there was a possibility that the chloroform test of the Pharmacopœia, which is repeated here, might be more applicable to this group of phenols than to the crystallized carbolic acid, it was carefully tried, but the results were no better.

It is probable that the bromine test is the best and most accurate of all those which have been proposed for this carbolic acid group, but it is complex and troublesome, and as the writer has never needed it, he has no experience with it.

Some fifteen years ago the writer published a note on the character and uses of these phenols in the Proceedings of The American Pharmaceutical Association for 1868, p. 429. This note was revised and republished in The American Journal of Pharmacy, 1869, Vol. 41, pp. 259 and 353. It was there shown that the phenols of higher boiling point which now constitute this Crude Carbolic Acid, U. S. P., were from 3 to 4 times more effective as azymotics than the crystallized Phenol, and therefore were much better for all ordinary uses as azymotics, antiseptics and disinfectants, and were at the same time much less costly. The experience of fifteen years, during which time very large quantities of these substances have gone into use, has confirmed these statements, and enlarged the applications to such an extent that to attempt anything like a detailed account of the uses would require much time and space, and would be useless, because they are so generally known.

Beside the Crystallized Carbolic Acid considered in the last article, there are three forms of this Crude Carbolic Acid, U. S. P., which are in common use, and which seem to be sufficient for all the uses. The first and most important of these is the officinal substance now under review. A very common name for it, adopted by the writer long ago, is simply "Carbolic Acid, or Coal-tar Creasote, No. 1." This has, however, improved in quality of late years since manufacturers have taken out more and more of the weaker crystallizable carbolic acid, and is now no longer soluble to the extent it formerly was, and the labels are thus often misleading in regard to the solubility test.

From this all solutions, mixtures, etc., should be made for the general application of the substance to its ordinary and general uses. About 6 to 8 pounds of it to a barrel of water well agitated and allowed to settle, and the solution filtered if necessary, makes a very useful disinfectant for common profuse use in Hospitals, Almshouses, Jails, etc., and such a solution may be sprinkled over all surfaces, and upon bedding, clothing, etc., with all the advantages obtainable from the substance, and without injury. For soaking dirty or infected clothing before washing, however, this solution is not strong enough, and here the undiluted liquid should be used in the proportion of about $1\frac{1}{4}$ fluidounces to the gallon of capacity of the tub used for these macerations. A very small quantity of any alkali, or a little soap added effects the solution more easily, and is otherwise useful. A tub of such a solution kept in readiness to receive immediatly all articles of bedding, clothing, dressings, etc., from all infections, contagious or epidemic diseases, greatly diminishes the dangers of spreading. In all such diseases as Small Pox, Scarlet Fever and Diphtheria a simple precaution of this kind thoroughly carried out has a practical value which it is difficult to overestimate, and therefore it should never be neglected.

A very much nicer solution has been largely used for many years past, and the use of which is constantly increasing. This is generally called "Disinfectant Solution of Coal-tar Creasote, or Solution of Impure Carbolic Acid," and it should contain about 2 p. c. of the mixed phenols which constitute this "Crude Carbolic Acid," U. S. P. It is very quickly and easily made, simply by agitating well 2 parts of the Crude Carbolic Acid, U. S. P., with 88 parts of water, and filtering the solution through a wet paper filter directly into the bottles in which it is to be kept for use.

This is a clean and colorless solution, entirely volatile, and it does not injure clothing, carpets, bedding or anything of the kind, and therefore it may be sprinkled freely upon anything, however nice. The odor is disagreeable,—far more disagreeable than that of a stronger solution of Crystallized Carbolic Acid,—but it becomes rapidly less disagreeable in use to most persons, and is far more effective than the crystallized acid. This solution is the form most convenient and effective for the treatment of all superficial or cutaneous pain as an anæsthetic. If the fingers be held immersed in this solution for ten minutes, in half that time the cuticle will begin to turn white, the skin to shrivel like a washerwoman's hands, and a slight numbness will be felt. These all increase, and at the end of ten minutes are marked, and the increased numbness is accompanied by a pricking sensation suggestive of the smarting pain which longer immersion produces, and of which this is the beginning. It is a very singular characteristic of this pricking and smarting that it is much increased by holding the hand high above the head, and entirely relieved by holding it down. That is, draining out the blood increases the pricking, whilst filling the part with blood relieves it, and replaces it by a sense of fullness and numbness. The sensibility of the surface is very much diminished or lost, but this loss does not extend below the immediate surface. In ten minutes after the surface is dry, the whiteness and shrivelling disappear gradually, but the numbness and anæsthesia remain, or disappear much more slowly. These are the general indications to the use of this solution in burns, scalds, erysipelas, and other entirely superficial pains.

The 2 p. c. solution is too strong for such applications, and must be diluted by the addition of from one to two parts of water at the time of using it. One part solution and one part water for the thicker and less sensitive surfaces of adult males,—and one part to two of water for the more delicate surfaces of women and children, the strength being adjusted to each case. If applied too strong the pain will, after a time, recur, or be increased, and if too weak will be but imperfectly relieved, but either the one or the other extreme can be surely determined if the part can be alternately held high and low, for if the pain be from applications too strong it will be increased on elevating the part and diminished on holding it down. But if the pain be from the burn through the application of solution too weak to control it, it will be increased by holding the part low. The best, and indeed the only proper way of applying the solution to burns, erysipelas, etc., is by very thin cloths,—such as old worn muslin or handkerchiefs. A saucer is kept by the side of the patient supplied with the proper dilution for the case, and the cloths are wetted from time to time as indicated by the return of pain. If the burn be a grave one or the pain severe, the cloths should be frequently changed during the first few hours at least. Later the cloths may be covered with light oiled silk so that the patient may not be disturbed during sleep. In slight burns or scalds of fingers, hand, wrist, etc., it is often sufficient to wrap the part in the thin cloth, and keep it wet without changing it, putting the oiled silk over the dressing only at night, to prevent evaporation. If the strength be properly adjusted to the case, and the solution be properly applied, the pain will always be relieved within ten minutes, so effective is this local anæsthetic, and solutions made from this Crude Carbolic Acid, U. S. P., are more effective than when made from the crystallized acid.

The vapor of these phenols is also anæsthetic to the mucous surfaces of the lungs, and the vapors from those of the higher boiling points are more effective than those from the crystallized acid. Hence if such a solution as this be allowed to evaporate from wet cloths in rooms occupied by patients suffering from pulmonary irritation, relief will be obtained, and this is the rational explanation of the benefit obtained from sending children with whooping-cough to gas manufactories,—or more recently of evaporating cresol or cresylic acid in the rooms of such patients by a small lamp. But the good effect may doubtless be as well obtained by wetting cloths,—larg or small, in proportion to the effects desired or obtained,—with this 2 p. c. solution, and hanging them in the rooms to evaporate. The solution is generally well dispensed in bottles of two pints each, with appropriate labels and directions, and is so inexpensive and so readily made, that it is easily and quickly accessible to all, both for disinfectant and anæsthetic purposes. The vapor of these phenols is said to be of no effect as a deodorizer and disenfectant, because it is too feeble, recent experiments having shown that nothing less than about 1 p. c. is really germicide. And that very weak solutions really seem rather to favor than prevent the reproduction of germs. That when used as a deodorizer its own powerful odor only predominates other odors, and does not destroy nor correct them, and of course does not affect the sources from which the hurtful odors emanate, unless applied to these sources in sufficient strength. But in considering the possible and probable aerial effect of the vapor there is one relation in which it seems to be overlooked, namely: its relation to the lining of the air passages when the vapor is breathed with the air, which air carries also other vapors and odors. A man, though occupied at other work, in rooms where the vapor of the phenols is prevalent, will very quickly have his renal secretion respond to delicate tests for the phenols, and these phenols he must get chiefly through his respiration, and this proves that he must inspire more of them than he expires, and that therefore he tends to accumulate them. The deleterious odors and vapors of the air must go with these vapors and be subjected to the same processes of condensation and absorbtion, and also of elimination, and reasoning from known reactions of gases and vapors, this cannot go on without change in both, and if both are changed then both are modified, and are so far destroyed by assuming other forms and conditions. Again, the vapors of the phenols are anæsthetic, and therefore tend to blunt or diminish morbific sensibility and irritability, hence it is quite rational that they should blunt and diminish the sensibility to infection and contagion, whether these occur through chemical or vital action.

There is, nevertheless, great danger of relying too much on deodorizers, disinfectants and antiseptics, and they are always badly used when they in any degree take the place of cleanliness and ventilation, and it should never be forgotten that they are of the greater value in proportion as their use is preceded and accompanied by the greatest attainable degree of cleanliness and ventilation, and that these latter are much better without disinfectants than disinfectants are without them.

The Coal-Tar Creasote, or impure Carbolic Acid, No. 2, is a grade of this mixture of phenols that is below that of the officinal one, but it is a grade which from being less expensive has many important uses whenever larger quantities are needed for rougher yet perhaps not less important purposes. It is a mixture of the phenols, etc., of higher boiling points than the Crude Carbolic Acid, U. S. P., and contains more tar oils. From 40 to 60 p. c. of it is soluble in water and the proportion thus soluble regulates its true value. It is almost entirely free from the crystallizable carbolic acid and consists mainly of cresol, xylol and the tar oils, but in proportion to the phenols it contains it is more effective than the No. 1, because those which it does contain are the most effective ones, and are held in more permanent and durable conditions by the tar oils with which they are associated.

For absorbtion by slaked lime, sawdust, charcoal, or sand to form disinfectant powders, and for painting over woodwork or walls of foul places, in jails, almshouses, etc., it is preferable to the other grades. This is the grade which most closely approximates in its uses to the crude carbolic acid of the common market, which is sold by the gallon or barrel to Boards of Health and public institutions for profuse use. but it is rather nicer and more definite in strength and composition, and though very rank and strong has a somewhat less offensive odor. It is quite as good, if not better, than the No. 1, to be kept in hospital wards for instant admixture with the dejections of patients, and for similar uses in water-closets, cess-pools, urinals, etc., and about stables and outhouses, where its oily nature and more difficult solubility renders it less liable to be quickly washed away. Another important advantage it has is that while the other grades are heavier and therefore tend to settle to the bottom of any but dense liquids, this form containing largely of lighter tar oils tends to float upon the top of sewage, etc., and thus in a measure seal it from the air or correct its emanations at their source. It is very deadly to the lower orders of both animal and vegetable life. Carefully adjusted solutions of it may be successfully applied to the destruction of insects, both on plants and animals, but great care must be taken not to get the solutions too strong. The writer knew of a fine Moss Rose bush and a valuable poodle being both destroyed with the insects which infected them, while had the solution used been weaker the insects alone would have been destroyed.

Another not unimportant use to which this grade is well adapted is to destroy the minute plants which grow as a green mould on brown stone, brick, etc., in damp and shady places. Rows of valuable houses, situated on the southerly side of streets which lie in an easterly and westerly direction, are very much disfigured by the growth of these cryptogams, and it is not uncommon to see stone-cutters at work laboriously chiseling them off. If these portals, balustrades, steps and areas be occasionally washed with solutions or mixtures of these phenols of sufficient strength,—namely, about one or two per cent.,—these plants will be killed, and soon after they are killed they lose their hold and can be washed off with street hose and broom. The proper mode of application for such purposes is to pour into an ordinary bucket of water about two wineglassfuls of the carbolic acid, stir very thoroughly with a common dust brush, and then keeping the mixture well stirred, to go over all the surfaces with the mixture, applying it by the brush. This is best done about dark in the evening. Then in the morning the surfaces may be washed down with the broom or hose, when most of the plants may be detached. A few repetitions of this treatment, say a week apart, will soon cleanse the stone or brickwork from these plants, and afterward an occasional application will keep them clean and free, even under the same conditions of moisture and shade in which the little plants formerly flourished.

These circumstances furnish an excellent illustration of how these phenols act as germicides, and in poisoning an otherwise fertile soil against the growth of germs, and the way in which they do this is probably through some modification or some degree of their anæsthetic effect on living matter, for it has been abundantly shown that where the phenols are not in sufficient proportion to kill living germs they may suspend their vitality until the phenols themselves are decomposed, or evaporate, or are washed away.

Like anæsthetics upon animals there seems to be a quantity which stimulates, a larger quantity which stupefies, a still larger quantity which suspends vitality, and finally, a still larger quantity which destroys vitality or kills. And the dose is probably different for different germs.

ACIDUM CHROMICUM.

CHROMIC ACID.

CrO_3 ; 100.4. — CrO_3 ; 50.2.

Chromic Acid should be preserved in glass-stoppered vials.

Small, crimson needle-shaped or columnar crystals, deliquescent, odorless, having a caustic effect upon the skin and other animal tissues, and an acid reaction. Very soluble in water, forming an orange-red solution. Brought in contact with alcohol, mutual decomposition takes place. When heated to about 190° C. (374° F.), Chromic Acid melts, and at 250° C. (482° F.) it is mostly decomposed with the formation of dark green chromic oxide and the evolution of oxygen. On contact, trituration, or warming with strong alcohol, glycerin, spirit of nitrous ether, or other easily oxidizable substances, it is liable to cause sudden combustion or explosion.

If 1 Gm. of Chromic Acid be dissolved in 100 C.c. of cold water and mixed with 10 C.c. of hydrochloric acid, the further addition of 1 C.c. of test-solution of chloride of barium should cause not more than a white turbidity (limit of sulphuric acid).

This excellent description of Chromic Acid leaves very little to be desired. It is perhaps well to know that the crystals as described are always damp,—or rather are never dry, and should not be condemned unless there be liquid present on the bottom of the bottle. The crystals being wet, and adhering to the glass is the natural medicinal condition of the acid, and to get it dryer than this is a costly and unnecessary process for medicinal uses. But if so wet as to have a stratum of liquid at the bottom, then either too much water or too much sulphuric acid, or both, are present. The water is only objectionable as a diluent and as fictitiously increasing the cost, but any great excess of sulphuric acid is objectionable from a medicinal point of view. The check on the amount of sulphuric acid admissible as given by the Pharmacopœia, is perhaps less definite than it should be, because a white turbidity is not definite and will be differently construed by different persons. It would have been better to have made the test quantitative.

A specimen of the acid supposed to be strictly officinal in regard to the admissible proportion of sulphuric acid was tried quantitatively as follows: Treated strictly by the direction of the Pharmacopœia, it gave almost at once a distinct white turbidity. In half an hour there was a distinct stratum of precipitate on the bottom of the beaker. In 12 hours the precipitation was complete and the precipitate a very considerable one. Another c.c. of the test solution of chloride of barium was then added, and gave again a white turbidity, showing that the first had not thrown down all the sulphuric acid. The mixture was well stirred, allowed to settle for 12 hours, the precipitate washed twice by decantation, filtered out, dried and weighed. Calculated as sulphate of barium it gave 6.1 p. c. of sulphuric acid. But the yellow color of the precipitate showed the presence of chromate of barium. A gramme of the Chromic Acid was then taken in a beaker of 75 c. c. capacity, 8 c.c. of hydrochloric acid added, and then carefully, 5 c.c. of alcohol. When about 2 c.c. of the alcohol had been added violent ebullition occurred, and the reduction of the acid seemed complete. When all the alcohol had been added the mixture was boiled during 5 minutes and then 50 c.c. of water was added. Then test solution of chloride of barium was added in excess, about 2 c.c. being needed to complete the precipitation. The precipitate was washed first by decantation and then on a weighed filter and dried until it ceased to lose weight. It then weighed 0.133 gramme, equal to 5.6 p. c. of sulphuric acid. This is certainly the maximum proportion of sulphuric acid that is admissible, and the chromic acid would be much better if it contained less.

The reason why the amount of sulphuric acid present should be small and be definitely limited, is very easily understood. In medicine chromic acid is used only as a caustic or escharotic, and it is perhaps the most important and most valuable of all the errosive caustics, for one simple and characteristic reason, namely, that it is self-limiting in its action in a degree that no other destructive caustic is. It is an active oxidizing agent, and destroys the tissues to which it is applied by oxidation. Thus far its action is similar to that of other caustics, such as nitric acid, for example. But every molecule of chromic acid which destroys a molecule of organic tissue is itself destroyed and rendered inert by being reduced to an insoluble and inert oxide of chromium ; and this principle and degree of self-limitation is not obtained from any other caustic. Sulphuric acid is also a destructive caustic, but not in the same way nor by the same reaction as chromic acid, and it is not self-limiting. Both the sulphuric acid itself and the products of decomposition by it are more continuously and injuriously irritant. It is therefore a more painful caustic than chromic acid, and produces deeper, more prolonged and more irritable sloughing. Hence it is that sulphuric acid is a painful caustic while chromic acid is not. That is, both may produce severe pain, and possibly for a short time equally severe pain, but the self-limiting action of the chromic acid carries its self-limiting effect to the pain also, so that both the action of destruction, and the pain also, are comparatively soon over, and the vital processes go on to separate the slough at once and with little secondary or after irritation.

Hence, the importance of having the proportion of sulphuric acid in the chromic acid as small as practicable and definitely limited. A little sulphuric acid is always present in chromic acid as an unavoidable accident from the process of manufacture, but from want of skill or from carelessness, there is often more left in than should be, while the process by which it may be all removed is troublesome, expensive and unnecessary.

Chromic Acid is rarely, or perhaps never well used in the solid form, because its application cannot be properly limited nor quantity properly adjusted. It is therefore the practice of the best surgeons who are most skillful in its use to liquefy the acid, as soon as they get it, by the addition of water. And as it is needed as strong as possible, so that the smallest possible quantity can be used in an application, the smallest quantity of water that will liquefy it should be added. Some surgeons are in the habit of taking a one ounce vial of the acid and adding to it half a fluidounce of water. This liquefies all, or nearly all the acid at first, but on standing till cold (the solution having heated up the mixture), a small proportion of the acid crystallizes out and serves to keep the solution fully saturated until it is all used. This is a very good method of managing it, but perhaps a better method is to first add two fluidrachms of water, shake well, allow it to settle for a minute or two and then pour off all this solution and throw it away. Then add to the remaining crystals in the vial one and a half fluidrachms of water, when the solution will be saturated as by the first method, and a small proportion of crystals will generally remain undissolved. The rejected portion of the solution will contain nearly all the sulphuric acid which was present, and will leave the remainder in the best practical condition for use,—that is, almost free from sulphuric acid.

The solution is perhaps best applied by means of a glass rod with a smooth end. This will safely carry about half a drop at a time, and may be used as often as needed and with any desired amount of friction upon the parts, but the rod should be dipped in water and dried with a cloth each time before being dipped again into the bottle. A glass brush carries much more of the solution at a time, but generally too much, while it is not easy to get it out of the brush in definite or limited quantity; and friction with the brush is liable to leave spiculæ of glass upon the surfaces. Small pellets of cotton,—especially gun-cotton,—or small pieces of sponge, on a probe or in a forceps serve well to apply the solution, but these should not be dipped into the supply bottle, because they leave a portion of their decomposed material in the bottle to damage the remainder of the solution, the solution being almost as destructive to cotton and sponge as it is to neoplasms. The round smooth end of a glass rod is perhaps the best means of application, and if the surfaces be well dried beforehand the application of a small quantity can be nicely limited and controlled. And by the application of small quantities at intervals of say 24 hours, thin and limited exfoliation of diseased tissue may be repeated to any desired depth, and the healthy surrounding parts be subjected to the least practicable destruction or irritation.

Solutions of chromic acid are very powerful disinfectants and deodorizers even when quite dilute; but like those of permanganate of potassium they discolor everything so badly as to obstruct and limit their use to cases wherein other means fail.

Chromic acid stains the skin and clothing very badly, and the stains are often almost indelible. Indeed, a very good indelible ink for marking linen is made from chromic acid. Diluted hydrochloric acid, in the proportion of about one part to two of water, is the best thing known to the writer for removing these stains, but it will only remove them easily when they are recent and not too deep.

ACIDUM CITRICUM.

CITRIC ACID.

$$H_3C_6H_5O_7.H_2O\ ;\ 210. — 3HO, C_{12}H_5O_{11}.2HO\ ;\ 210.$$

Colorless, right-rhombic prisms, not deliquescent except in moist air, efflorescent in warm air, odorless, having an agreeable, purely acid taste and an acid reaction. Soluble in 0.75 part of water and in 1 part of alcohol at 15° C. (59° F.); in 0.5 part of boiling water, in 0.5 part of boiling alcohol, and in 48 parts of ether. It is nearly insoluble in absolute ether, chloroform, benzol and benzin. When heated to 100 C. (212° F.), the Acid melts and gradually loses 8.6 per cent. of its weight. At a higher temperature it emits inflammable vapors, chars, and is finally dissipated without leaving more than 0.05 per cent. of ash. On adding an aqueous solution of the Acid to an excess of lime-water, the mixture remains clear until boiled, when a white precipitate separates, which is nearly all redissolved on cooling.

If 1 part of the Acid be dissolved in 2 parts of water and treated with a solution of 1 part of acetate of potassium in 2 parts of water, the mixture should remain clear after the addition of an equal volume of alcohol (tartaric and oxalic acids). If 1 Gm. of Citric Acid be dissolved, without heat, in 10 C.c.

of a cold, saturated solution of bichromate of potassium, no darkening of the liquid should be observed within five minutes (abs. of 1 per cent. or more of tartaric acid). An aqueous solution of the Acid should not be darkened nor be precipitated by hydrosulphuric acid (lead and copper). If the crystals have left, on ignition, some ash (see above), this ash should not turn blue by treatment with a few drops of water of ammonia (copper), nor should the further addition of one drop of test-solution of sulphide of ammonium cause any black coloration (lead, copper and iron). 10 C.c. of a concentrated solution should show no precipitate within five minutes after the addition of 1 C.c. of test-solution of chloride of barium with excess of hydrochloric acid (sulphuric acid).

To neutralize 3.5 Gm. of Citric Acid should require 50 C.c. of the volumetric solution of soda.

Preparation : Syrupus Acidi Citrici.

One or two points in the above description and tests are intended to be left to the common intelligence of those who apply them, and yet perhaps they may sometimes escape notice. In testing Citric Acid it is important to powder two or three ounces or more of it together, and to take care that this be not taken from the surface of the package, because large and pure crystals are commonly on the surface, while the smaller fragments, and those most liable to be impure, are by transportation shaken into the middle or lower portions of the package. Any one or two single crystals taken from any part of a package are pretty sure to be good, whether the average of the package be so or not.

In dissolving 1 gramme of citric acid in 10 c.c. of cold saturated solution of bichromate of potassium it is essential to have the acid in fine powder, otherwise the time required for the solution interferes with the time stated for the test. Darkening of the liquid very soon takes place, no matter how pure the acid.

The very best citric acid of the market, and of a quality entirely unexceptionable, will at times, if not always, show a discoloration and even a scanty precipitate by hydrosulphuric acid. But if the acid be good that precipitate is iron, and not either lead or copper. Even should it be a mixture of the three, and yet be in so small a proportion as to produce only a darkening by the test, the metals will not be present in hurtful quantity. The test is, therefore, hypercritical.

There are often, if not generally, traces of sulphuric acid present in the best obtainable Citric Acid, and although this is permissible by the Pharmacopœia, yet still its test is hypercritical and will reject all the acids of the market, if rigidly applied.

The final quantitative saturation test is a very good and useful one, and under ordinary circumstances is of itself conclusive. When the acid is dry and of good quality it will overstand this test by the amount of sulphuric acid present.

The next acid,—the Acidum Gallicum, Gallic Acid,—this writer knows very little about. The description and tests seem very clear and full, the description especially so.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. SEPTEMBER, 1883. No. 11.

THE DISCUSSION ON MEDICAL ETHICS.

Is it derogatory to the professional character of a physician to advertise his art and skill, and his results, for gain, as other artisans do; or to hold patents on surgical instruments and medicines,—as he does on his books by the copyright,—as other artisans do for pecuniary profit; or to consult with his antagonistic competitors, rivals and opponents, either for or without a money consideration, or entirely from motives of liberality and humanity?

And, if it be derogatory, is it so as a mere matter of individual good or bad taste, which should be left entirely free to individual conviction,—and which can be wisely and safely left so,—or is it derogatory because it violates a moral principle and derogates a moral law, which, as a common law of general application and force, should and must control dissenting individuals even to the denial of individual claims to freedom of action?

And, if it be derogatory because it detracts from, damages or annuls a moral law, is it necessary or wise to formulate or express in language the derogation; or is the law so universally known and followed, as the rule of conduct in the profession, that it is puerile and humiliating to have it expressed and recorded as a moral statute?

Such are the main points under discussion, and it may possibly assist in their settlement to look at them from a point of view not yet assumed in the controversy except by natural inference.

There is an idea,—perhaps a law,—by and through which all human relations are governed. In the very limited conception of Infinite Wisdom and Intelligence that can be reached by the highest degree of human intelligence, the ultimate thought is "the greatest good to the greatest number." This is the elementary basis and foundation of all law. It is equally the source of the Decalogue and the Golden Rule, and of all systems of religion and philosophy. Though never attained, nor fully understood, all moral and civil government is based upon it, and in the aggregate merely expresses the progress made in human affairs in reaching toward it. Through it the Creator has always ruled all creatures, and from it men derive their right and power to rule man. It makes right and wrong, truth and error, justice and injustice, and thus calls into existence the conscience, or a moral consciousness. It limits the liberty of the individual, if it does not deprive him of all individual liberty of action, by prescribing what he may not do. With what he may think, as a mere emotion of his individual nature, it may have little to do. But when any emotion passes into action and comes to affect others either as a moral or physical force, then individual liberty is virtually at an end, for it must yield to whatever stage of progress the time may have made toward "the greatest good of the greatest number."

With some such line of thought let each physician scrutinize the issues of this controversy. First, the greatest good to the greatest number in the world,—in his country,—in the community immediately around him; and secondly, the greatest good to the greatest number in his profession. A large majority of physicians will probably find that it is by no means for the greatest good of the greatest number either in the community or in his profession that he should advertise his own or others' opinions of his knowledge or skill, or of their results, as other artisans may or may not do. That he cannot hold patents to gain money by exclusive proprietorship or monopoly of appliances which are exclusively or directly applicable to the relief of human suffering; while he may hold a copyright on a book which indirectly relieves human suffering by spreading his knowledge for the general good, of how he has found, or how he believes relief may be attained. The patent seeks to secure to him the exclusive proprietorship of his intelligence, experience and skill. The copyright seeks to spread as widely as possible the results of his intelligence, experience and skill, that they may do the greatest good to the greatest number, and the moral quality of the pecuniary gain in the two cases is easily discriminated.

They will also probably find that the liberality and humanity claimed for heterogeneous consultations are of a very limited and superficial character, and are very far from being for the greatest good of the greatest number either in the community or in the profession. They will surely find that all the liberality and humanity can be easily secured to both the community and to the profession without such consultations in ways as numerous and as varied as the conditions under which such consultations can possibly be sought. For example, take away the money consideration altogether from such consultations and their moral quality is so far improved that, although not for the greatest good,—nor for any good to the community,—they will, in emergencies, cease to be derogatory to the professional character.

Finally, if individual human actions are not always based upon the rule of greatest good to the greatest number, and if different classes and professions have different and special relations to the general rule or law, subject to different interpretations, then it must certainly be well to have the special relations formulated and expressed in definite, written codes, if only for preservation and official reference, that each individual may see how entirely he is subordinated to the common good, and how little liberty of dissent he has outside of his own conscience, because such liberty when put in action, as individual right, is so liable to be simply lawlessness under a specious and dangerous disguise.

The *New York Medical Journal* for August 11, 1883, at page 157, has a letter from Dr. H. R. Hopkins, of Buffalo, which is based on an article from the last number of this pamphlet upon what constitutes a consultation. This letter so seriously misapprehends the meaning of the article upon which it is based, and the principal issues of this discussion, as to demand notice lest other readers of the pamphlet may be misled as to its true meaning and intent.

Dr. Hopkins thinks the supporters of the old code against the new one, have misconceived the motives and wishes of the advocates of the latter code by representing it for what it is not, and thus have really made a great issue out of nothing,—or at least that one writer in support of the old code has done so, and has only just now found out, by a review of the old code itself, that the whole controversy was brought on, and is carried on, by an unwarranted belief that the advocates wanted anything else than a mere fair and just interpretation of the consultation clause of the old code, and that when this clause comes to be critically and literally construed and interpreted, from its own side of the question, by one of its own defenders, there is shown to be no disagreement,—nothing to controvert, but that in short, under the construction put upon the consultation clause of the old code by this pamphlet in the last issue, no other code is needed, and Dr. H. merely asks the Judicial Council of the American Medical Association to ratify this construction of the Association's Code in order to settle the whole question at issue, and suffer the new code to be abandoned because it is and has always been just like this interpretation of the old code. In other words, that any defenders of the old code who accept such an interpretation of it, abandon their former position and go over to the new code by conceding all that its advocates ever wanted.

By what mental process such a conclusion can ever have been reached it is impossible for this writer to understand, unless Dr. Hopkins so misunderstands the definition of a consultation, which he partly quotes, as given by this writer, as to think that he has abandoned or so modified his former position on the subject as really to go over to the new code.

Nothing could be farther from the intention or meaning of this writer, and he earnestly begs any one, who, like Dr. Hopkins, may have that impression, to correct it at once. But this writer's difficulty is to know how any one could have got that impression from what was written on the subject of consultations. The old code defines what a regular and an irregular practitioner is, and encourages consultations among the former, but distinctly forbids it with the latter. In trying to define what is and what is not a consultation, the writer tried to keep this line of distinction clear and sharp, as the old code has it, and not a word nor a thought can be found in the article which tends to break it down. On the contrary, the entire article, in trying to show exactly what a consultation is and what it is not, shows just what The American Medical Association forbids, how it forbids it, and why, and insists on the point that in all meetings with irregular practitioners, however brought about, no consultation nor any appearance of consultation is permitted. It has always been conceded on all hands, that meetings with irregular practitioners have always occurred and must continue to occur from the unavoidable conditions of the case, but that if there be no holding of council together,—no joint action or responsibility,—no acknowledgment of association or fellowship, either real or apparent, then such meetings were not consultations in any sense of the word, and were not included in the prohibition, if only because they could not always be foreseen or foreknown. But consultations with irregular practitioners were and are forbidden by the old code, as they should be, but are distinctly permitted by direct legislation in the new code, and it is difficult to comprehend how any writer of intelligence and ability can possibly so confuse the subject as to see no difference in propositions which are directly opposed to each other by the very terms in which they are stated. And it was direct opposition and antagonism to the prohibition of the old code which gave rise to the new one, and no serious claim was ever made by the advocates of the new code that any form of consultation with irregular practitioners could ever be held under any proper interpretation of the old code. The claim has always been that the law of this State made certain classes of hitherto irregulars to be regular, and that the main necessity to repeal and reverse the old code was based on this law.

SPECIFIC GRAVITY OF LIQUIDS.

This relation between volume and weight is very important, because there are so few substances known in which this relation is exactly the same. Then, with increasing accuracy of observation, small differences in the specific nature of things become more important, and with this the importance of accurately measuring these small differences. Specific Gravity is one of the constants of nature,—that is, substances generally, whether simple or compound, natural or artificial, have a fixed or specific density, the value of which may be expressed in the relation of volume to weight, and it is only necessary to define the conditions of temperature and pressure, and to have a standard of unity to measure and compare them by, to multiply observations and knowledge by this means almost indefinitely. As temperature and pressure vary very much under ordinary circumstances, it is customary, in very delicate determinations, not to attempt to control them, but simply to observe them with care, and then by corrections reduce them to the standard adopted. For the purposes of medicine and pharmacy, barometric pressure may be disregarded, but temperature is quite important, because all changes of temperature cause corresponding changes in volume, but the rate of change is different for different substances, and often different for different temperatures of the same substance.

A prime necessity for measuring the relation between volume and weight, is a uniform standard to measure by, a substance to which under definite conditions all other substances can be conveniently referred. The substance adopted for comparison, by universal consent and usage, is pure water, and to get this pure, and practically free from dissolved air, it must be distilled and recently boiled. But water, like all other substances, changes in volume with or by changes of temperature; but, unlike any other known substance, it has, within the range of ordinary easy observation, a point of maximum density, and upon this most curious phenomena the whole order of animate and inanimate nature upon this globe depends. If water was not an exception (and probably it is the only exception) to the general law of expansion and contraction by changes of temperature, this world would be a changeless waste of uninhabitable inorganic matter. From about 4° C. = 39.2° F. the molecules of water increase the length of their vibrations both by increase and decrease of temperature. That is, the water expands in volume from about that point, whether it be heated above that point or cooled below it, within the present range of observation, and therefore that point is accepted as its point of maximum density. But it expands either way so very slowly for the first few degrees that the exact point is difficult to determine, and may be closely approximate only. The rate of expansion is probably nearly uniform, but the amount of expansion for each degree of temperature increases very rapidly as it is warmed, so that the total increase of volume for the first 5° C. is equalled or doubled in the next 2°, and the expansion for the first 7°, or from 4° to 11° C., is exceeded by the expansion for 1° between 26° and 27° C. Hence, water being accepted as the standard of unity for measuring the relations of volume to weight in other substances, it is very important to know what temperature is adopted for the unit of measure.

The best standard temperature is that of the maximum density of the water,—namely, 4° C.=39.2° F. This appears to be almost universally adopted throughout continental Europe, and its use is gradually extending to Great Britain and this country. But in the latter countries there is much confusion, as good authorities still give 15.6° C.=60° F., while in giving specific gravities authorities rarely state to which temperature they are to be referred, while the difference is very considerable. In continental Europe the standard being a given volume of water at 4° C., the liquid to be compared is an equal volume, but this may be weighed at the same, or at any other temperature. The standard temperature is not often stated, but is generally taken for granted to be at 4° C. But the temperature of the liquid to be compared is generally stated,—occasionally as 0° C., but much more commonly as 15° C. This latter expression means that the specific gravity is the comparison of equal volumes of water at 4° C., and of the other liquid at 15° C., the first being taken as unity. Then the other will be expressed in decimal fractions above or below unity. Rarely both liquids are taken at the same temperature of 15° C., or at least this appears to be the case. In Great Britain and this country both liquids are very commonly weighed at the same temperature of 15.6° C.=60° F., and when this is the case it is almost impossible to compare the results accurately with those taken in the other way,—or in any other way. Hence, it is very desirable that all observers, and especially all teachers, should strive for a universal method, and the best method is to take water at 4° C. for the standard, and an equal volume of other liquids at any temperature, provided this temperature be stated.

The temperatures of 15° C.=59° F., or 15.6° C.=60° F., are neither of them the most convenient for weighing liquids, because during a large part of the year they cannot be cooled to these temperatures without ice, and this is not universally accessible, and involves much time and trouble. Hence it is not uncommon of late to weigh liquids at 25° C.=77° F. This is near the temperature of ordinary working rooms, and can be easily commanded all the year round without trouble or loss of time, for it is much easier to warm a liquid up a little than to cool it down, and whenever one of these critical or testing processes is made easier, its utility is increased by its being more frequently applied.

All that is needed, then, for taking specific gravity of liquids is a specific gravity bottle of proper construction. Any bottle or flask the diameter of the neck of which is not more than one-tenth to one-fifteenth of the diameter of the body will make a fairly accurate specific gravity bottle, and the size should be proportionate to the quantity of liquids at command, but the larger the bottle the more accurate will be the general results. The ordinary specific gravity bottles as sold are not of the best construction, chiefly because they have no provision for expansion of liquid without overflowing, and therefore it may not be useless to represent one or two of a construction that is convenient for attaining very accurate results easily. Figure 1 of the cut is an ordinary 500 c. c. measuring flask, selected with a narrow neck and the mark low in the neck. A section of the neck just above the mark but including it is then heated in the lamp and drawn out so as to contract it to about one-half the original diameter. This is chemically cleaned, dried and tared, and the tare marked upon the glass. It is convenient to have a counterpoise for such a bottle, and this is easily made of a small vial and shot, the vial being closed by a rubber stopper which does not change in weight by hygrometric moisture. Such a counterpoise is illustrated by Fig. 3. It is sometimes convenient that this counterpoise should not only counterpoise the bottle, but also the standard volume of water. Then 500 grammes of recently boiled distilled water is carefully weighed into the flask at the temperature of the room and weights. This at room temperatures should fill the flask to near the top of the narrow portion of the neck. The flask is then corked and placed in a large bath of ice and water immersed to the upper end of the neck contraction. The bath is to be kept supplied with a moderate stratum of pieces of floating ice during two hours, being occasionally stirred. A corrected thermometer in the bath should indicate about 3° C. during the first hour, and should then be allowed to gradually reach 4° C. by a diminished supply of ice. At the end of the two hours, when the bath has been kept at 4° C. for at least half an hour, the flask should be raised just enough above the surface of the full bath to get the surface of the water in the neck on a level with the eye. A dot is made on the glass with a small file at the lower or lowest part of the crescent-like meniscus, so that when seen horizontally the lowest part of the curve just touches the dot. A slender thermometer, Fig. 2, whose error is known, is then passed down into the flask, still in the bath, and is moved around until it remains without change, and is then read. It will always be found to be within 0.2° C. of the required 4° C., and this is sufficiently accurate, as the water does not perceptibly expand within a degree each way from 4° C. The volume of 500 grammes of water at 4° C., or at its maximum density, is now obtained, and the 500 multiplied by 2 gives 1000. Place a decimal point after the 1, and the standard of unity is complete by which to measure all other liquids.

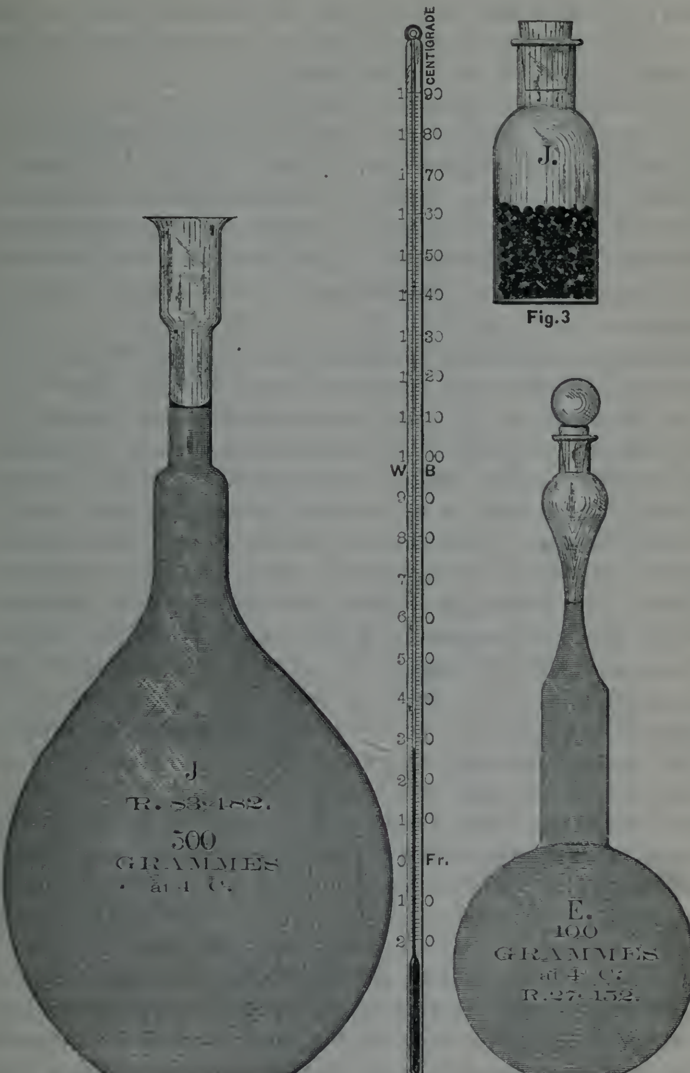


Fig. 1 Fig. 2 Fig. 3 Fig. 4

SPECIFIC GRAVITY APPARATUS.

The dot on the neck of the flask is afterward to be extended around the neck to form a ring, so that in reading, the front and back part of the mark may be made to coincide, thus securing a horizontal position for the adjustment in filling.

It is convenient to have one or more smaller flasks for smaller quantities of liquid, and a flask of 100 c. c. is represented by Fig. 4, made very much in the same way. In such, the bath alone must be depended upon for temperature, as the contraction of the neck necessary for accurate reading is too small to admit a thermometer. Still smaller flasks down to 10 c. c. may be made in the same way, but with such, great care and skill are needed to obtain accurate determinations.

Returning now to the large flask, if the bath be brought to 15° C.=59° F., and the water inside be stirred with the thermometer until it also reaches 15° C., and the thermometer be removed, the water will be found expanded considerably, so as to stand much above the ring mark. With a pipette take out water until the meniscus is again adjusted to the mark, remove the flask from the bath and allow it to attain the temperature of the room and then weigh it. The water will now weigh 499.72 grammes, which multiplied by 2 gives 99944. A decimal point placed before this makes it ·99944, which is the apparent s. g. of water at 15° C., as compared with water at 4° C., as unity or as 1.00000. But this is the apparent and not the true s. g., for in raising the temperature of the water from 4° C. to 15° C., or 11° C., the flask has expanded so as to hold more water up to the ring mark than it did before, and therefore the volume of water is not exactly the same as before, but is greater by the amount of the expansion of the glass. The amount of this expansion of glass vessels by temperature has been frequently determined by good observers, and for a 500 c. c. flask it has been found to be about ·00002 c. c. for each 1° C. Then, as the temperature was raised 11° C. the total would be ·00002 multiplied by 11, which is equal to ·00022 c. c., and this, for the purposes of this correction, may be taken as grammes. Then the flask being ·00022 gramme larger at the second weighing than at the first or standard weighing, this amount must be subtracted from the apparent to get the true s. g. Then ·00022 subtracted from ·49972 gives ·49950, and this multiplied by 2 gives ·99900 as the true s. g. of water at 15° C. as compared with water at 4° C., as unity. In this way the following specific gravities for recently boiled distilled water were obtained by actual experiment with the 500 gram. flask.

In using a 100 gramme flask, of course the correction is just one-fifth of the fraction above given; that is (·000020÷5=).000004 gramme for each 1° C.

	Apparent s. g.			True s. g.
At 4° C.=39.2° F.	1.000000.	corrected for	0° C.=·000000.	1,000000.
" 15° C.=59° F.	.999440.	"	" 11° C.=·000440.	.999000.
" 15.6° C.=60°F.	·999286.	"	" 11.6° C.=·000464.	·998822.
" 22.2° C.=72°F.	·998180.	"	" 19.4° C.=·000776.	·997404.
" 25° C.=77° F.	·997680.	"	" 21° C.=·000840.	·996840.
" 37.8° C.=100°F.	·993770.	"	" 33.8° C.=·001352.	·992418.
" 50° C=122° F.	·989170.	"	" 46° C.=·001640.	·987530.

This is intended to illustrate the error through expansion of glass vessels, and the rule and method of correcting it ; and also the effect of temperature on the expansion of liquids, the observations being made with a large flask, weighed to milligrammes, thus extending the figures to six decimal places. This is far beyond the sphere of other errors, such as those of filling, reading the mark, pressure, etc., but it illustrates the necessity for a uniform standard, which is not yet attained, in general usage, and the nature and extent of the principal difference between apparent and true specific gravity ; and it shows that the error for expansion of glass in the ordinary range of specific gravity determinations,—that is up to 25° C., is always beyond the third decimal place, and hence it is that it is commonly and properly disregarded in every day practice. The specific gravities stated in medicine and pharmacy are always apparent, and it is supposed that the pharmacopœias and their commentaries always express apparent specific gravities, though this is nowhere stated, nor even do they state the temperature of the standard volume of water. They have a stated temperature, which is not uniform, but leave it to doubt whether the standard volume of water is to be weighed at their stated temperature or at some other.

There is reason to believe that many of the published tables of specific gravities are corrected for all the errors, small and great, and that these tables are often adopted and quoted in pharmacopœias and dispensatories, and that this is the reason why the apparent or uncorrected specific gravities of every day practice so rarely agree with them. Therefore, it may be said, as a general deduction or inference, that whenever an apparent specific gravity agrees with authorities such as the pharmacopœias, within one or two units of the third decimal place, it is practically and sufficiently correct. But when different temperatures are adopted for the unity standard, the difference is liable to be greater, especially in the specific gravity of heavy liquids. For example, in the case of Sulphuric Acid, where s. g. is relied upon as the principal indication for strength, and where small differences of strength are often important to be known, the differences in the temperature of the standard volume give an error of just about one unit in the third decimal place. That is, a concentrated Sulphuric Acid compared with water at 4° C., and weighed at 15.6° C., gave a s. g. of 1.83689, and the same acid compared with water at 15.6° C., and weighed at 15.6° C., gave a s. g. of 1.83781.

In light liquids such as Ether, however, the difference is removed to the fourth decimal place, or beyond the usual reading limit. The U. S. P., of 1880, directs that the s. g. of its stronger Ether must be "not higher than 0.725 at 15° C. (59° F.), or 0.716° at 25° C. (77 F.)," and it does not give a temperature for its standard volume of water. This Ether, when compared with an equal volume of water at its maximum density, the Ether being at 15° C.=59° F., has an apparent s. g. of 0.7246, and when compared with an equal volume of water at 15.6° C.=60° F., the Ether being at 15° C. = 59° F., the apparent s. g. is 0.7255, a difference which, under ordinary circumstances, is unimportant, though it is easily recognized by ordinary good management. The same Ether weighed at 25° C.=77° F. compared with the standard volume at maximum density gave an apparent s. g. of 0.71449,—compared with the standard volume at 15.6° C.=60° F., the apparent s. g. was 0.71481.

The s. g. of distilled water not boiled, nor very recently distilled, compared with recently distilled and boiled water, and both at 4° C., wás found to be 1.000006, or a difference of only three milligrammes in a 500 gramme bottle. Water of excellent quality, in its natural condition, namely, the Ridgewood water of Brooklyn,—containing about 7 grains of solid matters to the gallon,—gave a difference of 8 milligrammes in the 500 grammes. Its s. g. therefore, compared with an equal volume of recently distilled and boiled water, both at the same temperature, is 1.000016. Well water containing about 30 grains of solids to the gallon gave in the same way a s. g. of 1.000570.

These observations are made and given to show that the ordinary small specific gravity bottles as sold, used with ordinary scales, may be easily tested without the refinements required for accurate critical work, since they are rarely weighed more closely than to the fourth decimal place. Ordinary distilled water, or even boiled rain water, is sufficiently good for the purpose.

A specific gravity bottle is the only trustworthy way of getting moderately accurate specific gravities, and whether home-made or purchased, it is easily tested.

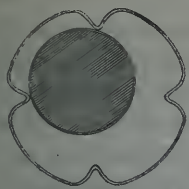
Hydrometers marked for s. g., and for degrees of any arbitary scale, as Baumé, Cartier, etc., are useful for many purposes and very convenient in application, but their results are at best only rough approximations. For frequent extemporaneous use in unskilled hands they furnish very useful information in a very short time, and with very little trouble, if so constructed and managed as to give their best indications. But all the old arbitrary scales should be avoided, and those marked for specific gravity only should be used.

THE URINOMETER.

This instrument is simply a small hydrometer with a range or scale limited to the specific gravity of urine. As commonly sold it is so faulty and so unmanageable as to be almost useless, while the need of a moderately trustworthy instrument is daily more and more felt, as accurate observation is so rapidly improving the art of medicine. Next to the clinical thermometer there is perhaps no instrument more useful to the observant physician, nor more frequently required in daily practice, than the urinometer. In the importance of its indications, also, it is often second only to the thermometer. The specific gravity bottle is the only accurate urinometer, and the foregoing note on the specific gravity of liquids was written mainly as introductory to the use of specific gravity in the examination of urine. But the specific gravity bottle, and the necessary scale and weights cannot be carried to the bedside, while a properly constructed hydrometer can be, and will serve well to indicate when the greater accuracy of the specific gravity bottle is needed. With a good hydrometer and a little skill and practice in the use of it the bottle will not be needed once a week in an active practice, and yet all the needed information will be had with very little loss of time and without the carrying of vials of urine oftener than is needed for microscopic examinations.

There are some good urinometers sold, but the number is small, and often the best are so large that they are not adapted to the pocket, and often it is impossible, when they are most needed, to get enough urine to fill the jar, while their required temperature of 60° F. is difficult and troublesome to attain. But by far the largest number sold are grossly inaccurate, and almost impossible to manage within the narrow limits of their utility.

Their defects are numerous and very general, but the defect which chiefly invalidates them is the cylindrical shape of the air chamber as seen at Fig. 4 of the following illustrations. This shape in a cylindrical jar but little larger than the hydrometer gives a line of contact and cohesion between the instrument and the inside of the jar which is fatal to a free movement up and down in the liquid, and therefore a free and correct floating is nearly impossible. It is quite impracticable to keep the instrument in the centre of the liquid even for a moment or two until read, and the moment it touches the jar the reading is so liable to serious error that the instrument may become not simply useless, but hurtful through giving information that misleads. Beside this, the stem is usually too large to give a distinct reading scale. A proper shape for the air chamber is that of a double cone, base to base, as seen in Fig. 1. In this there is but a single point of contact with the side of the jar, and thus the friction and cohesion is limited to the minimum degree. The stem should be as small as possible to contain the paper scale, because upon this depends the width of the subdivisions of the scale and the distinctness of the reading. The scale should extend from 1.000 to 1.060, and should be so divided that each figured line should represent ·010, and each subdivision ·001, or a unit in the third decimal place. The scale is sometimes marked without the decimal point, as 1000,—1010, etc., and sometimes the unit figure, decimal point and first 0 are omitted, and the scale simply reads 0,—10,—20,—30, etc., the subdivisions being always the same. These latter forms of scale are good enough and are easily understood, but they are not the best form, and are not accurate in expression, for it is a specific gravity instrument, and water being unity, the other divisions are decimal fractions of unity, and should be so expressed. The scale should indicate the temperature to which it is adjusted, and this temperature should not be 60° F. or 62° F., as is common, but should be 25° C.=77° F. This latter is a much more convenient temperature because it is nearer to that of the modern sick room, and because if below that it can always be attained by the warmth of



Section Through A A' Fig 1.

Fig. 2.

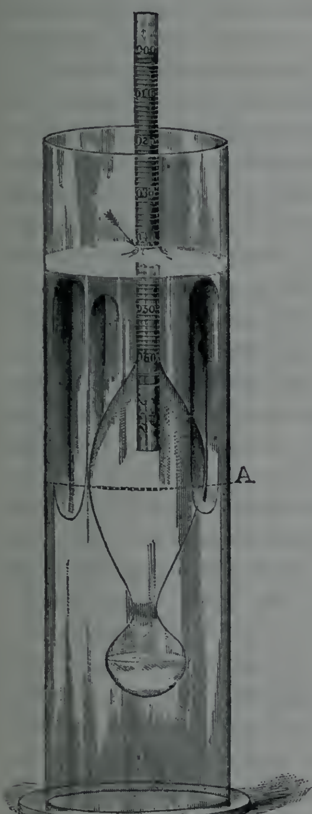


Fig. 1.

Fig. 3.

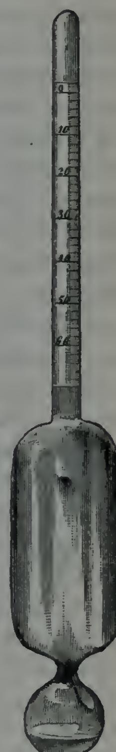


Fig. 4.

URINOMETER.

the hand on the outside of the jar in a minute or two. And if the temperature of the room in which the urine has been standing is within two or three degrees of that either way it is sufficiently near. The urinometer being adjusted to read 1,000 in water at 25° C.= 77° F., the reading will be one unit of the third decimal place, or one subdivision of the scale, too high for each 3° C.=5.4° F. above that figure. Therefore if the urine be measured just after it is voided, say at 37° C.=98.6° F., it will indicate just ·004, or four subdivisions of the scale above the true s. g. This of course is the highest temperature at which urine could be measured, and if such urine should indicate a s. g. of 1.026, and the ·004 be subtracted from it for excess of temperature above that of the scale, the true indication would be 1.022. If a specimen of urine was tried at 3° C.=5.4° F. above the scale temperature, that is, at 28° C.=82.4° F., then it would be ·001, or one subdivision above the true indication, and so on. It will thus be seen that four subdivisions of the scale is the greatest possible error from excess of temperature that this scale admits, and that being within the limit of variation of normal urine (about 1.018 to 1.028) is not a very serious matter in a large proportion of the applications of the instrument. Hence it is one of the advantages of this scale temperature of 25° C.=77° F. as a standard, that in a very large number of the instances of the very useful though negative applications of the urinometer, a thermometer is not essential, and is only needed when some abnormality shows the necessity for closer observations.

The next modification that the writer has to suggest is perhaps a still more important one, because it renders the use of the instrument easier, with far less liability to error. This improvement is in the jar, and consists in indenting the sides of the jar, as represented in Fig. 1, and in cross section by Fig. 2. The jar is cylindrical, as in common urinometers, but has a foot for steadier standing. The glass of the cylinder is softened in the lamp, and while soft is indented so as to make a V-shaped projection inside the jar. These longitudinal grooves or indentations are repeated, so that there are four in all, and the effect is that the hydrometer cannot come to the sides of the jar at all, but must either float free in the centre or touch one, or at most two of the sharp edges of these indentations, as shown in the section, Fig. 2, and where it does touch, it can only be by a single point of contact between two convex surfaces, and thus the friction and cohesion will be reduced to a minimum. The jar, as seen at Fig. 1, is made by the lamp, and the flutes or grooves only occupy the middle half of the cylinder, but if made in a mould the grooves would extend from the lip to the foot, and this would be better, as then the jar would require still less urine to fill it. This is an important consideration, because it sometimes happens that the urine is very scanty when it is most important to know its density or s. g. All the apparatus is shown of full size in the illustrations, and the jar holds about 45 c. c., or $1\frac{1}{2}$ fluidounces, and when the urine is above the normal density a fluidounce or 30 c. c. will fill the jar sufficiently to float the hydrometer. If the indentations extended from top to bottom, as they should, somewhat less urine could be used.

The reading of the indications on the stem is a matter of importance, and requires the personal observation of each individual, and each will fall into a habit of reading, that will be sufficient, if adhered to, as long as the instrument lasts, but a good habit of reading is as easily fallen into as a bad one. Many persons read the indications from below the surface of the liquid, but this is not a good habit for two principal reasons: First, all hydrometers are constructed to be read from above the surface, because they are often used with colored and opaque liquids, which prevent reading from below; and secondly, because the distortion by the liquid is not inconsiderable, and varies with the density of the liquid. Therefore the indications should be read from above the liquid, or at least from above as well as below. The first thing essential to a moderately close reading is to have the stem entirely clean, for if greasy or soiled by the sebaceous matters of the fingers from handling, the liquid will not touch the stem in the proper manner for reading. When clean, the liquid piles up against the stem, covering from two to three divisions of the scale, and the rise of the liquid from the general level of the surface up against the stem gets thinner as it rises higher, so that the absolute point or feather-edge to which it rises cannot be seen, but there is generally a spot or section of a line of reflected light from the concave surface of the liquid when the stratum gets very thin upon the stem, that is useful as the line of proper reading, and the subdivision of the scale, which is nearest to this point when the instrument has come to rest, is the proper one to read. But very often this spot of light cannot be seen, or is seen as a broad and ill-defined reflection; then let the instrument be pushed down a little and set to vibrating up and down, and while it is thus moving let the line of liquid be observed against the moving stem. The horizontal line of the liquid does not move, but the stem does, and by the time the latter comes to rest the subdivision of the scale nearest to it will be easily seen, and when seen a few times it will be easily recognized ever after. The arrow in the cut points as nearly to the reading line as the engraver could make it with the object standing before him. As the flutings in the jar keep the instrument from coming to the side, there is always plenty of time for deliberate observation, and each observer will soon form a habit of observation quite correct enough to be within the sphere of general errors of all such instruments.

A small thermometer, graduated from 20° C.=68° F. up to about 35° C.=95° F., is needed to increase the accuracy of the indications where this is desired, but when the urinometer is carried to the bedside, and frequently used there, merely as an approximative inquiry as to the general character of the urinary excretion, or when it is to be left with the nurse for consecutive observations which are to decide whether closer observations be desirable,—or, in other words, whenever the physician desires to know whether the urinary excretion does or does not vary beyond the normal range of say ·006,—then the instrument, whose extreme variation by temperature of the liquid does not exceed ·004, does not need a thermometer, and when not needed it is an unnecessary expense, and an unnecessary risk to the whole apparatus to carry it.

The apparatus is best carried in a common, round, pasteboard box, into which it fits closely, and which can be renewed at small cost as often as it is worn out. The box is about 4½ inches long by 1½ in diameter, and bears a label on which may be printed the standard for temperature of liquids, and the error of the instrument to be alluded to farther on.

For the double purpose of carrying it more safely and of absorbing the moisture from it after it has been rinsed out each time, thus saving the box from this moisture, a piece of old, thin, soft muslin about eight inches square is placed over the box and pushed down into it by the jar as it is put up after use. When the jar is in place another piece of similar soft thin muslin about 6 inches square is put over the mouth of the jar, and the hydrometer pushes this down with it into the jar. The thermometer can then be slipped down beside this, in the folds of the muslin, and the whole is well and easily packed, so as to be rather difficult to break with any ordinary usage.

This should be an instrument of very moderate cost, because very perishable and often to be replaced, and if of moderate cost it will not afford the time and skill to be very accurate. And as its indications are but approximative at best, from the nature of the instrument, it would be a waste of skill and money to aim at great precision, especially when the specific gravity bottle is so easily accessible when accuracy is required. Hence every one of these urinometers will have an error small or great, but this error will extend with tolerable uniformity throughout its scale, and the error is very easily found,—so easily that each physician should try his instrument for himself, and when he has once got the error so as to add or subtract it, as the case may be, whenever necessary, the instrument will be just as good as if it had no error, except for the small inconvenience of mentally correcting it at each observation, just as one corrects the time by a watch which is slow or fast, whenever such correction is necessary.

The upper mark for unity is corrected by simply filling the jar with common water and bringing this to the temperature of 25° C.=77° F., by the warmth of the hand outside the jar, while the water is stirred by the thermometer. As soon as the temperature is reached the hydrometer is cleaned and put in. The mark should never be more than two or three subdivisions too high or too low, but whatever it may be it is simply to be noted, and the probability is that this plus or minus error will extend throughout the scale. But this is by no means certain, and two other points, at least, in the range of the scale should be tested. All that is needed for this is a nine per cent. solution of common table salt.

Into a counterpoised two ounce vial weigh first 72 grains=4.665 grammes of common table salt in its ordinary condition. Then carefully add to it 728 grains or 47.175 grammes of ordinary water, cork the vial and shake it until the salt is dissolved. This solution has a s g. of just about 1.060 at 75° C.=77° F. as compared with water at 4° C. Fill the jar with this solution, bring it to the proper temperature and introduce the hydrometer. It should give about the same error in this reading as the water did, but whether the same or a different one, let it be noted. Then empty the vial, counterbalance it as before, and weigh into it an equal quantity of the salt solution and water, and having shaken these together, again fill the jar with this mixture at the proper temperature. The reading should now be 1.030, or be as near to it as the other readings were to their points, and thus the error of the instrument will be known at the middle and each extremity of the scale, and the error once known and noted the correction can be applied at any time, when the instrument will be as good as if it were accurate.

All this apparatus, both for the experimental trials and the practical results, was made for the writer by Mr. William Baetz, of 96 Fulton street, New York, who is an excellent glass blower and maker of specific gravity bottles, hydrometers, thermometers, etc., and who will supply orders for the urinometers. Samples of the urinometers, as patterns, will be supplied by the writer, free of cost, to any surgical instrument maker who is willing to make and supply them for sale to pharmacists and physicians. The cost should be about as follows:

For the hydrometer or urinometer	80 cents.
" jar, if made from tubing by the lamp	50 "
(If made in a mould much less.)	
" thermometer	$1.00
" case or box	10
	2.40
If tested and the error given on the label	60
Total	$3 00

DUQUESNEL'S "ACONITINE."

In No. 4 of this series of pamphlets, at page 167, there appears a short article under the above mentioned title showing that the substance sold by H. Duquesnel, of Paris, as "Aconitine Cristallisée," was not the alkaloid as it appeared by the label, but was really a nitrate of aconitine, and the evidence that such was the case was given in the paper.

This statement, made in November, 1882, was based upon two purchases from Duquesnel's agents here, made at not wide intervals. At the writer's request Duquesnel's attention was drawn to the facts, and the paper was sent to him. He emphatically denied the truth of the statement, and wrote vigorously on the subject. But all this did not rapidly change the condition of affairs, for in five subsequent purchases, under the same label, the nitrate was still found to predominate, although each purchase, excepting one, contained more of the uncombined alkaloid than the purchase before it, until by the time of one of the later purchases the proportion of uncombined alkaloid reached 32 p. c. of the whole yield, 53 p. c being combined as nitrate.

But now a very recent purchase yields 90 p. c. of the uncombined alkaloid and 5 p. c. of combined alkaloid, and the presence of nitric acid still very distinct ; and the loss unaccounted for remaining at about 5 p. c.

The substance, therefore, now is in much better accord with the label, and it is but fair and just to the maker to state the improvement. When 90 p. c. out of 95 p. c. total proves to be what it purports to be, it may be considered practically a fair result. It is, however, confidently hoped that this justly celebrated maker of some of these delicate alkaloids will do better than this in the future.

THE PHARMACOPŒIA OF 1880.

(Review continued.)

ACIDUM HYDROBROMICUM DILUTUM.

DILUTED HYDROBROMIC ACID.

A liquid composed of 10 p. c. of absolute Hydrobromic Acid [HBr; 80.8.—*HBr ;* 80.8], and 90 p. c. of water.

Diluted Hydrobromic Acid should be preserved in glass stoppered bottles.

A clear, colorless liquid, odorless, having a strongly acid taste and an acid reaction. Sp. gr. 1.077. By heat it is completely volatilized. On adding chlorine, or nitric acid to Diluted Hydrobromic Acid, bromine is liberated, which is soluble in chloroform or in disulphide of carbon, imparting to these liquids a yellow color. Test-solution of nitrate of silver causes a white precipitate, insoluble in nitric acid and in water of ammonia, and sparingly soluble in stronger water of ammonia.

On being kept for some time, the acid should not become colored ; test-solution of chloride of barium should not produce a turbidity or precipitate (sulphuric acid).

To neutralize 16.2 Gm. of Diluted Hydrobromic Acid should require 20 C. c. of the volumetric solution of soda.

This is a new preparation of the Pharmacopœia, although by no means new to therapeutic practice, and its officinal recognition will do much in securing for it a definite strength and quality. Made by various processes and of different strengths, and its use having survived these disadvantages, it now becomes officinal in a dilute solution with a good definition and tests; but the two tests for strength do not agree. The definition requires a ten per cent. solution. A very carefully made preparation gave, by the volumetric solution of soda test applied exactly in accordance with the last paragraph of tests, a strength of 10.1 p. c., and of course this is accurate. But the s. g. of this compared with water at 4° C., and weighed at 15° C., was not 1.077 as stated, but 1.0698, and at 25° C.=77° F., it was 1.0673. The s. g. of 1.077 is taken from Biel's Table given at page 421, and as will be shown, this table does not appear to be accurate. Whether Hydrobromic Acid becomes colored or not, "on being kept for some time," depends much upon the exclusion of accidental particles of dust or organic matters which reduce the acid. The writer has frequently seen perfectly good specimens which turned brown by liberation of bromine from such accidental causes. This Diluted Hydrobromic Acid contains nearly one-seventh part of the bromine contained in an equal weight of potassium bromide.

Some years ago the writer published a process for making a much stronger solution of Hydrobromic Acid in water (see Transactions of The Medical Society of the State of New York, for 1878, p. 173), and this process having been much used, and having proved to be a convenient one, it, or its product, might have been introduced into the Pharmacopœia with the same advantages as in the case of Phosphoric Acid. This acid contains 34 p. c., and is just half the bromine strength of potassium bromide, and thus the dose is very easy to adjust, while it can be diluted to any extent, serving, as in the case of Phosphoric Acid, to make the Diluted Hydrobromic Acid. The other chief advantage of this strong acid in this country of long distances and heavy freights, is economy in bottles, in transportation, and in the risks of transportation.

This stronger acid continues to be largely used, because it has the advantage of being applicable to some uses to which the dilute acid is not well adapted, and the increased demand for it of late is probably in part due to its being so conveniently used for making the officinal diluted acid, by the following simple formula:

Take of the 34 p. c. Acid..10 parts
Water...24 parts
Mix them. The result is an acid of 10 p. c., or the officinal acid.

In the paper on this acid alluded to above an error was somehow made in stating the specific gravity, and this error has frequently been over-corrected by various authorities. The s. g. given was, as compared with water at 15.6° C.=60° F., and the acid weighed at the same temperature, 1.274, and weighed at 25° C.=77° F. 1.257. Many hundred pounds of this acid have been made during the past five years by careful assay, the acid being always twice distilled and answering all the tests, and the s. g. has been very frequently taken, so that it can be confidently stated that compared with water at 4° C., and weighed at 15° C.=59° F., it is 1.28916, and weighed at 25° C.=77° F., it is 1.28312. These are the figures now obtained by a critical trial of a very carefully assayed acid containing 33.7 p. c. of the absolute acid, and an average of many years' experience varies very little from this result. Biel gives the s. g. at 15° C. as 1.303, and this difference is equal to about 1 p. c. in the strength of the acid. The writer's is an apparent s. g., while it is probable that Biel's has all the corrections applied. But as the sum of these errors is always a subtractive quantity, the writer's specific gravities, if corrected, would show a still greater difference.

Hydrobromic Acid has been shown to have the same therapeutic effect as potassium bromide, and yet it is not a simple duplicate of that salt, since by its use the effects of the base are avoided. Muscular degeneration or debility has often been alleged to result from a long continued use of any of the potassium salts, and when this effect is to be feared or corrected, hydrobromic acid has been substituted wholly or in part for the potassium salt. Again, when any of the bromides, by continued use, come to disagree with the stomach, they may be intermitted, and the acid substituted for a time, or the two may be alternated.

Its most common and probably most effective use, however, is as an addition, either constantly or intermittently, to solutions of the bromides when these have to be taken for a long time and in full doses. In this way full bromine doses may be easily maintained, while the effect of the bases is diminished.

Full doses of the acid are difficult to administer on account of its intense acidity. It is best given with sugar, or with syrup, or with syrup of acacia, and with lemon syrup it is somewhat like lemonade. Large dilution is always advisable. The dose of the officinal acid is 2 to 4 fluidrachms, which is equal in bromine to 17 to 34 grains of the potassium salt. An equivalent dose of the 34 p. c. acid is about 27 to 54 minims.

This acid is very useful in making extemporaneous solutions of many bromides. For example, the very effective bromide of lithium may be very easily made extemporaneously by prescription, by simply saturating, or nearly saturating, the acid with lithium carbonate.

Hydrochloric, Nitric and Sulphuric Acids are all very much more fully characterized than ever before, and the tests are full and definite ; and if hypercritical for most of the uses of the Pharmacopœia this is no fault, but will doubtless be a great advantage to the present condition of the market for these acids. The crude low-priced acids supplied to the arts and manufactures, which are sufficiently good for their purposes, will be excluded from medicinal uses, as they should be, by these tests, whilst all manufacturers of acids can, and many of them do, supply qualities at a very little higher cost, which respond moderately well to all the important tests given.

From some experience with them, but without special investigation, the writer believes that in some instances at least the s. g. and the saturation tests do not agree very well,—perhaps no better than in hydrobromic acid. Nowhere is specific gravity more important than with these acids, because it is the almost universal measure of strength by which they are sold, and it is perhaps unfortunate if these be obtained from tables rather than from practical observation, and it is certainly unfortunate that the s. g. at 25° C. = 77° F. is not given here as it is in so many other places, for it saves a great deal of trouble and so facilitates the application of the s. g. test that many more would use the test.

The density of these acids is commonly taken by hydrometer, and with the manufacturers Baumé's scale is almost universally used. Hence the marks on the packages of 20° for Hydrochloric Acid, 42° for Nitric, and 66° for Sulphuric, for the strengths required by the Pharmacopœia. But if these be referred to the apparent specific gravities or to any of the tables for converting them into specific gravities, they are commonly found to be inaccurate and indefinite. Some few manufacturers are now giving specific gravities on their lists, if not on their packages, and as progress in the arts is made, and as the Pharmacopœia insists on its standard, Baumé's and all other arbitrary scales will go out of use in the presence of the far better specific gravity scale. Although hydrometers are, at best, approximative only, they are, when graduated to the s. g. scale, so much better than the arbitrary or complex scales of the older usage, that their use for such purposes as measuring the strength of acids is greatly to be desired. The instrument makers and dealers now furnish, at a very moderate cost, either separately or in sets, three hydrometers graduated for specific gravity,—one for liquids lighter than water with a range of ·700 to 1.000, one from 1.000 to 1.400, and the third from 1.400 to 2.000. Those of German make are generally adjusted for a temperature of 62° F., but those made in Great Britain and this country generally adopt 60°F. It would much increase their utility, and therefore the sale of them if adjusted to 77° F. But any one who owns a set that he has tested throughout the range of the scale, can easily get the error for this difference of temperature in water, and then apply it to the readings throughout. In applying hydrometers to testing the strength of these acids, care must be taken to avoid the use of a narrow hydrometer jar, for reasons given elsewhere.

Many failures in the daily practice of pharmacy are due to deficiency in the strength of the acids used in the processes, and therefore when an officinal process into which an acid enters does fail, or is only a partial success, the fault is commonly that deficiency in the strength of acid has not been properly compensated by increased quantity. Such failures are often very unjustly charged upon the Pharmacopœia.

ACIDUM HYDROCYANICUM DILUTUM.

DILUTED HYDROCYANIC ACID.

[PRUSSIC ACID.]

A liquid composed of 2 per cent. of absolute Hydrocyanic Acid [HCN; 27. — HC_2N; 27], and 98 per cent. of Alcohol and Water.

Ferrocyanide of Potassium, in coarse powder, *twenty parts*	20
Sulphuric Acid, *fifteen parts*	15
Diluted Alcohol, *sixty parts*	60
Water,	
Distilled Water, each, *a sufficient quantity.*	

Place the Ferrocyanide of Potassium in a tubulated retort, and add to it *forty* (40) *parts* of Water. Connect the neck of the retort (which is to be directed upward) by means of a bent tube, with a well-cooled condenser, the delivery tube of which terminates in a receiver surrounded with ice-cold water and containing *sixty* (60) *parts* of Diluted Alcohol. All the joints of the apparatus except the neck of the receiver having been made air-tight, pour into the retort, through the tubulure, the Sulphuric Acid previously diluted with an equal weight of Water. Agitate the retort gently and then heat it, in a sand-bath, until the contents are in brisk ebullition, and continue the heat regularly until there is but little liquid mixed with the saline mass remaining in the retort. Detach the receiver, and add to its contents so much Distilled Water as may be required to bring the product to the strength of *two* (2) *per cent.* of absolute Hydrocyanic Acid, if tested by the method of assay given in the note.

Diluted Hydrocyanic Acid may be prepared, extemporaneously, in the following manner:

Cyanide of Silver, *six parts*	6
Hydrochloric Acid, *five parts*	5
Distilled Water, *fifty-five parts*	55

Mix the Hydrochloric Acid with the Distilled Water, add the Cyanide of Silver, and shake the whole together in a glass stoppered bottle. When the precipitate has subsided, pour off the clear liquid.

Diluted Hydrocyanic Acid should be preserved in small glass-stoppered vials in a cool and dark place.

A colorless liquid, of a characteristic odor and taste resembling those of bitter almonds, and having a slightly acid reaction. On being heated it is completely volatilized. If to the Acid, rendered alkaline by potassa, a little ferrous sulphate and ferric chloride be added, and the mixture be acidulated with hydrochloric acid, a blue precipitate will make its appearance.

13.5 Gm. of Diluted Hydrocyanic Acid, diluted with 30 C. c. of water, and mixed with enough of an aqueous suspension of magnesia to make the mixture quite opaque, and afterward with a few drops of solution of chromate of potassium, should require 50 C. c. of the volumetric solution of nitrate of silver, before the red color caused by the latter ceases to disappear on stirring (corresponding to the presence of 2 per cent. of absolute Hydrocyanic Acid).

The principal changes made in the above formula and process are in the details of dilution of the materials used, the management of them, and in the use of Diluted Alcohol in the finished preparation. In a long and successful experience in making this preparation, in quantities varying from those of the Pharmacopœia of 1870 up to forty times as much, with a trial of many variations of detail, the writer has never seen any need for the present changes. They may be improvements, but in the presence of a very easy and successful method it is difficult to understand how they can be, and therefore why they should be made. A rather slow and steady reaction between the materials is essential to the best results of the process, because under such conditions the gas is wholly and easily absorbed, and this slow regular reaction is greatly facilitated by the more dilute solution of the Ferrocyanide of 1870, and especially by the much larger dilution of the Sulphuric Acid. A Liebig's condenser or its equivalent, should be introduced between the retort and the receiver, and the end of the condenser should dip into the liquid in the receiver, and the receiver should be tared, and should be large enough to make the final adjustment in.

The substitution of Diluted Alcohol for Distilled Water in the receiver is intended to promote the stability of the acid, but how a more volatile liquid diminishes loss by volatilization is hard to understand, and how it assists in the preservation of a liquid which with ordinary care keeps well without it,—and which without ordinary care will not keep well with the alcohol, is equally difficult to understand. Beside, as the acid is commonly dispensed and administered by measure, the use of alcohol by diminishing the s. g. reduces the strength of the acid by somewhere about 7 or 8 p. c.

By the use of a condenser and Distilled Water in the receiver, the acid is easily obtained of 5 p. c. strength, and is rarely found below 4 p. c. But this is on a large scale. On the scale of the process of 1870 the water will contain from 3 to 4 p. c., and if it contains less it will be through incomplete absorption.

Neither the revision of 1870 nor that of 1880 give a method of reducing the strong acid of the receiver to the officinal standard, yet a concise method would be an improvement to the process. During the last ten years of the writer's practice the strength of the final product has been gradually increased until now it is left at 2.14 per cent. Such a strength, when put up in one ounce vials, and then one of the vials opened and assayed six months after, without special precautions, yields by a slight modification of the Liebig method of assay 2.1 p. c. By the U. S. P. of 1880 method it yields 1.94 p. c., and by a repetition of the first method, after the vial had been open some time and was partly empty, 1.99 p. c. The writer has always used the Liebig method of assay, and after trying that of this revision of 1880, still prefers the older one, as involving much less loss of acid vapor in the process, and therefore more accurate, while it is almost, if not quite, as easy of performance as the newer one, and involves less liability to error. Indeed, had the present revision adopted it, a grave error in the text, to be referred to later, would probably have been avoided. The Liebig method of assay and adjustment as used by the writer is as follows:

Take a beaker of about 100 c.c. capacity and a stirring rod. Put into it first 50 c.c. of water, then 5 c.c. of officinal 10 p. c. Solution of Potassa, and two or three drops of a cold saturated solution of sodium chloride; stir the mixture, and weigh the beaker and contents, including the stirrer. Then introduce by means of a pipette 2.5 c. c. of the strong hydrocyanic acid from the receiver. In doing this let the point of the pipette just touch the surface of the liquid in the beaker, so that the stream as it is delivered gets no exposure to the air. The pipette should not dip into the liquid more than a millimeter, in order not to take out liquid enough to change the weight. Stir the mixture gently, and again weigh the beaker and contents. The difference between this weight and the first one is the weight of the hydrocyanic acid. Add to this, with constant stirring, decinormal solution of nitrate of silver from a burette until a slight permanent turbidity or opalescence in the solution is obtained, and then read off the quantity of silver solution used. Each 1 c. c. of the silver solution used is equal to ·0054 gramme of anhydrous or absolute hydrocyanic acid. Now suppose 2.5 c. c. of the strong acid taken weighed 2.42 grammes, and required 22 c.c. of the silver solution to produce opalescence, then ·0054 multiplied by 22 gives the amount of absolute acid present in the 2.42 grammes taken for assay. Then as 2.42 is to ·1188, so is 100 to the percentage (2.42 : 1188 : : 100 :=)4.909+.

Next, suppose the receiver contained, after the portion for assay was taken out, 82.5 grammes=1273+grains, then as 100 : 4.909 :: 82.5 : 4.05 grammes, which is the total quantity of absolute acid present in the 82.5 grammes in the receiver.

Then if it be required to make this into an acid containing 2.14 p. c., the calculation for that purpose would be as follows:

As 2.14 : 100 : : 4.05 : 189.25+. Therefore the 82.5 grammes of strong acid in the receiver should be made to weigh 189 grammes by the addition of Distilled Water, or the 1273 grains should by a similar calculation be made up to 2920+grains. The diluted acid should then be again assayed for a verification, with only the modification of taking 5 c. c. of it for the weighing, instead of 2.5 c. c., as was done of the strong acid. The result of the verification should, of course, be 2.1 or 2.14 p. c. By the time this is transferred into small vials it will be but little over 2 p. c. unless especial care be taken, and by the time a one ounce vial of it is dispensed in prescriptions it will be a little under the required strength, though not sufficiently below for the deficiency to be of any practical importance.

The Pharmacopœia directs this acid to be preserved in glass stoppered bottles. This is a mistake, as was proved by the writer many years ago. This acid in ordinary one ounce glass stoppered bottles will generally begin to turn black within a year, and often it will within a year and a half become nearly as black as dilute ink. When this change was closely observed it was seen to begin between the ground surfaces of the stopper and the neck of the bottle, and from this point the brownish liquid would run down into the liquid below and apparently set up the same change there; and this change once started goes on pretty rapidly. If the bottles are inverted when filled the change seems to occur more quickly and go on more rapidly. Glass stoppered and corked vials filled with the same acid and placed side by side were repeatedly tried. The one underwent the change and the other did not. Finally, many years ago, when the writer put up this acid in ground-stoppered vials, a very considerable proportion of it, or probably all of it that was not consumed within a year, came back blackened and spoiled to a greater or less degree, and there was evidence that much was dispensed for use having a brownish tinge; and sample bottles saved from that time are now quite black. In 1876 a change was made to cork stoppered vials, and the writer cannot recall a single complaint of decomposition since that time, although occasional decomposition was to be expected from some vials containing films of glass which must be broken off and leave rough surfaces after being cleaned. Corked vials of the acid put up at or about the time of the change are in good condition at this time, except that they may have slightly diminished in strength perhaps.

When the starting point of this change was first discovered about the year 1874, it was supposed that the oil and emery then used for finishing the stoppering was the cause of the decomposition, and the bottles were all made chemically clean by soaking in concentrated sulphuric acid. This did not prevent the decomposition. Then the use of oil in finishing the stoppering was abandoned, yet still the decomposition occurred, and the writer, disheartened, was on the point of resorting to some of the admixtures used and recommended by various authorities,—some of which undoubtedly do prevent the change, when it occurred to him to leave the glass surfaces unbroken and use corks; when at once the whole difficulty disappeared.

It had been stated before these observations were made that the acid was affected by the alkali of some varieties of glass, and the elementary idea, or an indication of the direction in which to look may have been taken from some such statement as that of Mr. Rimmington in 1873, as mentioned by Mr. Siebold in 1874 (see Pharm. Journ. and Transactions, Vol. IV., p. 199), but if so, the writer had forgotten it. These observations, however, show that the unbroken surfaces of a glass do not effect the decomposition, while the ground surfaces of the same glass do; and it is therefore not at all probable that the alkali has anything to do with the decomposition, but that it is rather a mechanical or catalytic effect similar to the effects of platinum black. Nevertheless, the ground surfaces of some glass do not seem to produce the decomposition, because a ground stoppered bottle of German make has, within the writer's experience, kept a 2 p. c. acid unchanged either by decomposition, or in strength, for at least ten years. It is not certain now, however, that the surfaces were not paraffined. Again, the ground surfaces of the same glass cause the change sooner in some bottles than in others, and in a few bottles do not cause it for a long time, if at all; but this is rather curious than important, since vials with unabraded surfaces do not cause the decomposition so far as known. If any reader of these pages should know of a vial of this acid, sent out by this writer, in a corked vial, having decomposed, he will confer a favor by reporting it; and if possible sending the vial for a critical examination of its interior for accidental abrasion of surface.

Mr. R. A. Cripps, of London, has shown, in a paper published in the Pharm. Journal and Transactions, for May 18th, 1883, p. 917, that the Pharmacopœia has fallen into an error in the text of its new process of assay, which is so serious that it reduces the officinal strength to 1 p. c., or to just half of what it intends it to be, and what it states that it is. One of the writer's assistants has verified this statement of Mr. Cripps, and every one who has a copy of the new revision should turn to the heading of Diluted Hydrocyanic Acid, and either change the figures "13.5 Gm." to 6.75 grammes, or should change the "50 c.c. of volumetric solution of nitrate of silver," to 100 c.c., but should be careful not to change both.

One of the most serious difficulties of this process adopted by the U. S. P. of 1880, is the accurate weighing of a definite quantity of the acid without loss of strength during the process, and an inexpert person who has to take out and put back once or twice in adjusting the weight, will rarely get a trustworthy assay. To be at all trustworthy it should be carefully weighed from a narrow, finely graduated pipette, and the exact measure of the quantity be noted. The weighed portion is then thrown away and a fresh portion taken into the pipette and delivered by measure under the surface of the water for dilution.

The process of assay seems to have been adopted from the new German Pharmacopœia, but there it is used for estimating the very small proportion of hydrocyanic acid in bitter almond water where loss of strength by the weighing process is insignificant; but the German Pharmacopœia is free from the error above alluded to.

Diluted Hydrocyanic Acid is a very important therapeutic agent, as certain and as definite in its effects as almost any agent of the materia medica; and these effects are very well known, and their advantages and applications fully appreciated. But the dangerous character of the substance and the variations and uncertainty of strength to which it is liable, very much interfere with its usefulness. Nevertheless, when managed with intelligent care proportionate to its volatile nature, it does not lose strength largely nor very rapidly,—not as rapidly as solutions of ammonia or sulphurous acid. The writer has assayed acid from the same bottle repeatedly in course of its proper use and management, and found variations of only one or two-tenths of a per cent. from first to last of the bottle. That it does lose slightly through the cork is probable, but the loss within a reasonable time must be small. In support of these statements the following assays may be given: April 18th, 1882, or about 17 months ago, a portion of 168 pounds was made and adjusted to 2.14 p. c. Two one-ounce vials from this portion,—one glass-stoppered and the other corked, and both tied over with bladder,—were hung out upon the roof and were left there exposed to all the changes of weather through the two summers and one winter, and so placed as to get the direct rays of the sun during nearly all the time it was above the horizon. That in the ground stoppered bottle began to turn black in about a year, and is now black throughout. That in the corked vial only commenced to change visibly within about six weeks, and it is now tinged, though in fair condition. No trustworthy assay could be made of the black acid, though it still smelled strongly of the acid. The other vial gave 1.82 p. c. of acid.

Physicians who wish to use Hydrocyanic Acid may easily test it approximately at the time of use. If one drop of officinal,—or very nearly officinal acid, be added to 15 c.c.$=\frac{1}{2}$ fluidounce of distilled water in one vessel, and one drop of test solution of nitrate of silver be added to 7 c.c.$=2$ fluidrachms of distilled water in a test tube, and the first solution be dropped into the second from a pipette, and the contents of the test tube be closely observed for a few seconds between the drops, a distinct opalescence should be observed before the fourth drop is added, and the opalescence becomes very marked as the fourth and fifth drops are added. If the acid be of full officinal strength, a faint opalescence in the upper part of the test tube will be perceptible after the second drop, if closely looked for. But if the acid has lost a little in dispensing, and is near the end of a vial, four or five drops may be required. But if more than eight or ten drops be required, the acid has been badly taken care of, and should be rejected. Any soft water, such as rain water, will answer for this testing, provided it be free from chlorine, and this will be seen at once on adding the nitrate of silver solution to the water in the test tube.

It is a very curious fact, but one that has been repeatedly observed, that if, say 8 fluidounces of water containing but a small amount of chlorine,—such water as the Ridgewood water of the city of Brooklyn,—be rendered opalescent by say two drops of the test solution of nitrate of silver, well stirred in, this opalescence will entirely disappear on stirring in two drops of 1.97 p. c. hydrocyanic acid, and will be much diminished, but not entirely cleared, by one drop. In such testings and observations the drops should all be of the same size, and that is practically secured by dropping them from the same pipette.

A physician has recently mentioned to the writer that failing to get any effect from hydrocyanic acid as prescribed, he sent to five pharmacists for as many samples, two of which failed to react with nitrate of silver.

If makers would but be careful to send it out of full strength, and pharmacists would but be careful and skillful in keeping and dispensing it, there would be much less complaint of deficient strength, and it would be much more largely used with advantage.

In dispensing, it should never be poured from the vial, but always be taken out with a minim pipette, and be delivered into the prescription vial from the pipette. And, when diluted in the vial for administration, it should be dosed at the bedside also by an accurate measuring medicine glass.

Bearing in mind its easy decomposition, and the smallness of the dose, it can rarely be safely mixed with other ingredients in the same prescription, but had better be given separately, and be alternated with other medicines needed by the patient.

How it can by any possibility be of any use in some complex prescriptions into which it enters,—especially in such heterogeneous mixtures as "chlorodyne," it is difficult to understand, and the probability is that it is decomposed so rapidly that in a few days it could not be found.

It is said that when diluted to one-tenth of one per cent. it does not lose strength by ordinary exposure, but so weak a dilution would be difficult to assay accurately, to know whether it had lost strength or not.

AN EPHEMERIS

OF

MATERIA MEDICA, PHARMACY, THERAPEUTICS AND COLLATERAL INFORMATION.

VOL. I. NOVEMBER, 1883. No. 12.

THE DISCUSSION ON MEDICAL ETHICS.

The New York *Medical Journal* for September 8, 1883, page 255, publishes "An Open Letter to County Medical Societies in the State of New York, by Samuel S. Wallian, A. M., M. D., Bloomingdale, N. Y.," on the legal bearings of the code question.

The position taken by the author of this letter has been more than once disproved, but although he has evidently read the law which he interprets but does not quote, he so gravely misapprehends it as to be led into misstatements of its letter and spirit; and the subject is so important, and the misstatements are made in such positive and dogmatic terms that they may mislead some readers.

The author says: "There is no need of consulting the courts. The law is so plain that a wayfaring man though a doctor, even, need not err therein. The average school-boy can expound it without fear of tripping."

This is true, but the exposition, in the main, is exactly the reverse of what this "Open Letter" makes it, and hence the danger of such positive statements made upon a basis that is not quoted to sustain them.

The author of the letter begins by saying: "The Act of 1806 duly incorporated the Medical Society of the State of New York, and authorized the formation of the several county societies as auxiliaries."

That the exact reverse of this is true the law itself will show. The county societies were created first, and the State Society afterward as a body of delegates from the county societies, and therefore deriving both its legal existence and its powers from the county societies. In other words, the State Society was and is a representative body, and all its authority and power under a republican form of government is derived from the county societies; and its sole control over any minority of the county societies is derived from a majority representation. In other words, the State Society is only an expression of the collective will of the county societies, and exercises its powers through majority rule of the assembled county societies.

In order to prove the truth of this, and the error of the author of the "Open Letter," it is necessary to quote the first two sections of the law:

CHAPTER 138, LAWS OF 1806.

AN ACT

To incorporate Medical Societies for the purpose of regulating the practice of Physic and Surgery in this State.

Whereas, Well regulated medical societies have been found to contribute to the diffusion of true science, and particularly the knowledge of the healing art; therefore,

Be it enacted by the People of the State of New York, represented in Senate and Assembly, That it shall and may be lawful for the physicians and surgeons in the several counties of this State, now authorized by law to practice in their several professions, to meet together on the first Tuesday of July next, at the place where the last term of the Court of Common Pleas next previous to such meeting was held, in their respective counties, and the several physicians and surgeons so convened as aforesaid, or any part of them, being not less than five in number, shall proceed to the choice of a president, vice-president, secretary and treasurer, who shall hold their office for one year, and until others shall be chosen in their place; and whenever the said societies shall be so organized as aforesaid, they are hereby declared to be bodies corporate and politic, in fact and in name, by the names of the medical society of the county where such societies shall respectively be formed, and by that name shall be in law capable of sueing and being sued, pleading and being impleaded, answering and being answered unto, defending and being defended, in all courts and places, and in all matters and cases whatever, and shall and may have a common seal, and may alter and renew the same at their pleasure.

And be it further enacted, That there shall be a general medical society, to be composed of one member from each of the county societies in the State, elected by ballot at their annual meeting, who shall meet together in the city of Albany on the first Tuesday of February next, and being so met, not less than fifteen in number, may proceed by ballot to the choice of a president, vice-president, secretary and treasurer, who shall hold their office for one year, and until others shall be chosen in their places; and the said society, being so organized, shall be, and they are hereby declared to be a body corporate and politic, in fact and in name, by the name of "The Medical Society of the State of New York," and by that name shall be in law capable of sueing and being sued, pleading and being impleaded, answering and being answered unto, defending and being defended, in all courts and places, and in all matters and causes whatsoever, and shall and may have a common seal, and may alter and renew the same at their pleasure.

The next section of this law of 1806 which concerns the statements of the "Open Letter" is that upon By-Laws. It is as follows:

And be it further enacted, That it shall and may be lawful for the respective societies, to be established by virtue of this act, to make such by-laws, rules and regulations, relative to the affairs, concerns and property of said societies; relative to such donations or contributions as they, or a majority of the members, at their annual meeting shall think fit and proper: *Provided,* That such by-laws, rules and regulations, made by the Society of the State of New York be not contrary to, nor inconsistent with the constitution and laws of this State or of the United States, and that the by-laws, rules and regulations of the respective counties shall not be repugnant to the by-laws, rules and regulations of the medical society of the State of New York, nor contrary to, nor inconsistent with the constitution and laws of this State or of the United States.

This section is simply mandatory, and not penal. That is, it commands, but attaches no penalty of any kind, and yet the author of the letter ventures to assert that:

"Whenever a county society enacts a set of regulations (Code) 'inconsistent' with the regulations (Code) of the State Society, it simply and from that moment *ceases to have any legal existence.* It becomes, to use a political term, a rebel and seceder." * * * * "Taking the action of the Essex County Society as a sample of what others have done, a majority of 6 to 1 (18 to 3) declared by resolution, at their annual meeting in June last, that they *repudiated the existing code of the State Society,* and reaffirmed allegiance to the code of the American Medical Association. Hence, since the 26th day of June, 1883, the Essex County Medical Society has had no legal existence."

The extraordinary boldness of this positive assertion can only be properly realized by a careful reading of the whole law when it will be found to be unsupported by a single word or inference. There is no method of disciplining county medical societies who by their acts traverse the majority rule of the assembled county societies in the State Society, in this law of 1806, nor in the law of 1813, which is an amended repetition of the law of 1806, nor in any of the subsequent amendments to these laws. The force of the proviso of the law is not a penal one, and makes no allusion whatever to any loss of chartered existence through erroneous or repugnant by-laws, and it is certainly a violent straining of the proviso to draw any such inference from it. The argument of the new code movement to the effect that the new code was necessary in order to bring the by-laws of the State Society into harmony with the laws of the State by command of this proviso, was never pushed to the absurd reduction that the State Society had lost its legal existence by not having sooner adopted the new code, since the proviso applies equally to State and County Societies.

The only provision for disciplining refractory county societies is found, not in the organic law at all, but in a by-law of the State Society, and that by-law prescribes both the kind and the degree of such discipline, and these do not include loss of representation in the State Society, except by special application to the Legislature to suspend the corporate rights of such county or counties. The exact by-law is as follows :

"V. Relating to County Medical Societies."

"Sec. 2 If any county medical society shall neglect to perform all such acts as may be required to be done by it, by the law incorporating medical societies, or any other law of the State relative to the science of medicine, or shall do acts which may be considered derogatory to the honor of the medical profession, or shall oppose or neglect to comply with the by-laws of this Society, it shall be admonished touching any such proceedings; and if it is deemed necessary for the public good, that from the improper conduct of any such county medical society their corporate rights should for a time be suspended, then, and in that case, it shall be lawful and just for this Society to make application to the honorable the Legislature for such purpose."

Now, as the right of representation in the State Society is one of the corporate rights of county societies, here is a way, and the only way, in which that right can be suspended, and that way has not been resorted to. What, then, becomes of the whole tissue of misstatements of this "open letter," and of the alleged necessity for county medical societies to call special meetings and reverse their former decisions in order to gain admittance to the next meeting of the State Society.

It is an undisputed fact that a large majority of the county societies have either opposed or neglected to comply with a new by-law of the State Society. It is therefore clearly the duty of the minority of the county societies first to admonish the majority for such proceedings, and this the minority may be held to have done, possibly, by the vote of last year, and now, the admonition having been either unheeded or disregarded, the minority may take the next step, and petition the Legislature to suspend the corporate rights of the majority of the county societies. And if the Legislature should grant such petition, then the right of representation in the State Society among the other corporate rights of such societies will be suspended for a time, and the minority will have excluded the majority from the State Society, and will hold possession to do as they please. But how the minority of counties is to do all this in the face of any active opposition by the majority of counties is not clear; and such active opposition is, at last, aroused.

A tabular analysis of the vote taken at the last meeting of the State Society and published at page 247 of this series of pamphlets, shows that thirty out of the forty-six counties voting by delegates, opposed the new by-law, and that, in a total vote by counties, including delegates and permanent members, twenty-six counties voted against and sixteen for the new by-law, or more than two-thirds. But by popular numerical vote, disregarding counties, the individual votes counted fifty-eight to sixty-five, and the new by-law was thus confirmed. Now, if the twenty-six counties are to be disfranchised at all by the sixteen, it certainly cannot be done at the next meeting of the State Society, because the preliminary step of petitioning the Legislature to disfranchise them has not been taken. After that is taken the Legislature must act. Suppose this step be taken on the first day of the meeting by the sixteen counties, the twenty-six not being there in sufficient number to defeat it. And suppose the Legislature act upon it and grant the petition the next day, then and then only could the twenty-six counties be excluded, and the sixteen have full sway.

In view of what is here presented it is earnestly hoped that this "Open Letter to the County Medical Societies" may not succeed in misleading any of them.

It will be remembered that the N. Y. Academy of Medicine was committed to the new code by its delegates at the last meeting of the State Society. Three of the five delegates were present, two of whom voted to sustain the new code and one against it, while it was not generally known at that time which code would be most acceptable to the Academy, as the body had taken no action in the matter. Yet the old code was a part of its constitution and by-laws, and as all candidates were obliged to sign this constitution and by-laws before they could be admitted to membership, it could only be considered as being on the old code side of the question.

When the delegates, on their return from the State Society, made their report to the Academy it was expected that the issue would be brought, and that the Academy would have to place itself on one side or the other of the controversy. But an attempt was made to avoid that which was unavoidable, and a motion to pass the subject over prevailed, as though it were possible for any such body to thus avoid an issue which involved its organic laws.

Soon after this action it became more and more apparent that the principal officers of the Academy were earnest advocates of the new code or no code, and that the body was practically in the hands of the new movement through this circumstance, and through the untiring activity and energy of the leaders of the movement, whilst the Academy might or might not be in accord with its chief officers, and their earnest desire to change its plan of organization. It was plain that new members could not be admitted to its roll without subscribing to the old code of ethics, but was not so plain that candidates for membership were not subscribing to that code when opposed to it, and ready to help to defeat it whenever the issue was brought. Hence the postponement of the issue which had been effected was altogether in favor of that side of the issue which was so energetically advocated by the officers of the body, because it gave time and opportunity to reinforce their strength.

Seeing the position in which the Academy had placed itself by trying to avoid the issue, a number of the older and more conservative members introduced and carried at one of the regular meetings a series of resolutions instructing the Committee on Admissions to report no candidate for membership who was known to be in opposition to the code of ethics which he was required to sign in order to obtain membership. To an outside observer of the Academy's position it would seem like a very useless and harmless thing to pass such resolutions, for it could hardly be conceived that any gentleman would be likely to apply for admission whose moral sense was so highly cultivated that he needed no restraints from codes of ethics, and yet who would deliberately sign a code of ethics to which he was conscientiously opposed, and which, if so opposed to, he must of necessity take the first opportunity to annul. But this view of the matter was not taken by the new code party, for the new code and no code parties at once joined in a violent opposition to the resolutions, and tried in every way to obstruct their passage. Nevertheless they were passed, and the form was gone through by which their reconsideration was debarred.

At the same meeting another resolution was introduced and carried by which the Academy disavowed all sympathy with the new code and no code movements, as represented in the action of the State Society, and the parliamentary process by which reconsideration was debarred was also adopted again here.

This resolution of course placed the Academy in a very definite position upon the issue, and the body then adjourned from April until October, apparently in order that hot blood might cool, and more sober second thought prevail.

At the approach of the October meeting the President of the Academy issued a circular letter containing an earnest appeal for a return to fraternal harmony and adjustment of present difficulties. An irrepressible conflict was recognized and as the best way to repress this a new departure was proposed. By confusing medical ethics with medical politics both were condemned under the latter title, and the proposed new departure was to so change the organic laws that everything relating to ethics, excepting a broad and ineffective generalization, be eliminated from the organization of the Academy. In other words, as a kind of peace-making compromise between old code and new code, the extreme of no code was proposed and advocated. This most remarkable way of settling the difficulties, involved radical changes in the organic laws, which reached beyond the extreme of the new code party, and the way in which it was to settle the defenders of the old organization and the old code was so easily seen that it called out a circular signed by nine old and prominent members of the Academy. This answering circular briefly pointed out the character and drift of the proposed mode of settlement, and appealed to the members to be present at the meetings to oppose such extreme and radical action.

As a very curious circumstance connected with these two circulars, the author of the first one published his conviction that the second one was a silly hoax; and for this conviction gave reasons that he considered conclusive.

At the October meeting the President's amendments came up, notwithstanding that the Council disapproved of them and recommended their withdrawal. They were freely discussed in Committee of the Whole, but could not be finally acted upon at that meeting, and were therefore carried to another meeting on October 18th, when they were again discussed in Committee of the Whole, reported to the Academy and put to vote. A motion was immediately made and carried that the vote be taken by ballot. This cut off the yeas and nays which were so desirable upon such an issue. A skillfully put motion for indefinite postponement was, however, seconded, and the yeas and nays upon this were called for, so that at last a record of the vote was obtained that was practically correct so far as showing where each voter stood. The recorded vote on indefinite postponement was 94 to 117, and the direct vote by ballot taken immediately after was 121 to 92. The Academy in its by-laws had a wise provision against capture by an excited majority, in a by-law which required a three-fourths vote to change its by-laws, and therefore, these amendments were lost, and the organization remained as of old, with the old code of ethics still as a part of its constitution and by-laws. But the majority present was not satisfied; and as being a majority it had that much control. It was moved that the resolutions passed at the April meeting instructing the Committee on Admissions to enforce the by-laws upon new members, be rescinded. Against this it was claimed that a motion to reconsider them having been lost, they could not again be brought up for consideration at all. But the President decided that rescinding and reconsidering were entirely different, which was, in effect, that they could be rescinded without being reconsidered. An appeal was taken from this remarkable decision, but of course the majority sustained the decision and the resolutions were rescinded, as though it were possible to repeal or cancel an act without a reconsideration of it. This leaves the Committee on Admissions uninstructed as regards the enforcement of the constitution and by-laws, but it is hard to see how it permits any disregard of them, or how any candidate can be admitted to membership who will not support the old code of ethics.

From the published reports of the meeting it does not appear that the separate and subsequent resolution passed at the April meeting, whereby the Academy disavowed all sympathy with the State Society on the code issue, was acted upon. If not, then that still standing defines the present position of the Academy as being unchanged from the past, and therefore as still adhering to the old code.

It is sincerely to be hoped that the Academy may be allowed to sustain this position even if the resignations of those who can no longer live under the old code have to be renewed and accepted, as logically they must be under such circumstances, since New York city is certainly entitled to one body of medical men who can live under and defend the old code, even if they should constitute a minority of the profession of the city; especially since the County Society has been so very successfully carried by the new movement.

At the annual meeting of The New York County Society two tickets were presented for offices, the one fairly committed to the defence of the old code, and the other as fairly committed to the new. This was designed to bring out the whole strength of the profession of the society on the issue, and in this way decided it as far as that society was concerned. The total membership of the Society prior to this annual meeting is supposed to have been about 900, while the average ordinary regular meetings of the Society were attended by some thirty or forty members. This annual meeting and its direct issue, however, brought together some 518 members, and to these were added at that one meeting the unprecedented number of eighty-one new members, making a total recorded ballot of 599 votes.

The Society having been in the hands of the new code party, and practically the source from which that movement originated, it seemed hardly doubtful how these eighty-one new members would vote, and therefore as a fair test of how the Society, as previously constituted, really stood, it was proposed to exclude these eighty-one new votes brought in just at this critical time, but the motion was at once declared out of order. The nominee for President who supported the new code obtained 375 votes. The defender of the old code, 220; majority, 155. Majority less the 81 new votes, 74. The majority would, therefore, have been a very decisive one even without the newly made members, and would have been more creditable to the Society.

This election definitely settles the question as far as the New York County Society is concerned, and as the County Society is supposed to embrace or include the membership of all the other societies of the county, it may be accepted as settling the question for the entire profession of New York when the question is considered numerically,—one vote being as good as another,—the vote of the recent graduate just starting his claim to some narrow specialty, just as good as that of the veteran whose broad education has been supplemented by years of experience.

It remains now to be seen whether anything like this result can be obtained in the other counties throughout the State whereby to maintain the ground attained in the State Society.

In the last note the New York County Medical Society is credited with being practically the source from which this new code and no code movement originated. A similar statement was made in a former note by the writer in regard to the origin of the Registry Law, and as this latter statement has been emphatically denied,* the former one may be denied upon the same grounds. It is possibly literally true that the new code and the preceding Registry Law were formulated and obtained by and in the State Society, but it is also equally true that in a practical sense both the Registry Law and the new code movement originated in the New York County Society, and that without the efforts of that Society the State Society would not have adopted nor advocated either measure. Farther than this, it must be apparent to every one who has followed this question back to its small beginnings, and then followed the controversy, that the whole movement was brought into the State Society by a very few members of the New York County Society, whom every one knows from their untiring energy and vigilance in the accomplishment of their purposes. And the prominent wonder to-day is, how such an enormous amount of energy and activity could have been aroused, in a single county of the State, to overthrow a long established code of ethics on the principal charge that it is a dead letter, or that when enforced it is illiberal. That is, the entire profession of a large and important State has been divided into two or three opposing factions, and has been separated from the profession of all the other States, and all this to overthrow a code of ethics which, whether it ever did any good or not, has never been seriously or justly charged with doing harm.

Therefore if there be no other motives for the change than those advanced by its advocates, and if the defense of the old code, which has been thus forced upon its advocates, be entirely unsuccessful, the cost to the general profession will be infinitely greater than the sum of all the advantages claimed, and the means taken greatly dispropor

*See *The New York Medical Journal* for October 6, 1883, page 376.

tionate to the end sought, unless it be that, in a greatly overcrowded profession, which is still in process of being more and more over-crowded, there is some process of evolution at work, through this movement, whereby a permanent differentiation is to be started for future good.

TESTING URINE FOR GLUCOSE

BY FEHLING'S SOLUTION.

The diseased condition which is characterized by the presence of glucose in the urine, in common with most other chronic diseases, is much more easily cured when treated in the earlier stages; and as the proportion of glucose in the urine is a pretty accurate measure of the stage of the disease which produces it, the importance of detecting and roughly measuring small amounts of glucose in urine can hardly be over-estimated.

Glucose, often called simply sugar, or grape sugar, or invert sugar, or dextrose, is often present in very small proportion in normal urine, and is still more frequently present and in much larger proportion in the urine of healthy persons, after over-feeding or unusual feeding, or some peculiar irregularity of diet or digestion, but present only for a short time, and disappearing with the absence of the special cause. But such temporary presence occurring often and persisting longer from time to time, is the probable early history of every confirmed case; and if so, the early recognition of the symptom will lead to an early investigation of the cause, and the prompt adoption of means for its removal.

The best test for glucose in the urine, and the one most widely known, is by the use of Fehling's standard copper test solution. Many other modes of testing have been proposed and used, and some others are doubtless more critically accurate when in the hands of expert analytical chemists, but no other has stood the test of experience so well, nor proved to be so well adapted to ordinary every-day use by those who needed it most, yet who could not be most expert in the critical use of such agents. Neither do the modifications of Fehling's test, when it is put into the form of solid lozenges or pellets, seem to be always trustworthy, convenient though they may be, so that the slightly modified or improved solution of later years seems to be the test best adapted to common use.

It is, however, liable to change by keeping, and yet there is no indication of this change in the appearance of the solution. Its use as a test depends on the circumstance that when solutions of glucose are boiled with certain alkaline solutions of some salts of copper, the copper is reduced to the state of a yellowish or copper-colored insoluble suboxide in a practically fixed relation or proportion. When long kept the solution is liable to change, so that when diluted with water and boiled, the copper salt is reduced as if glucose was present, when it is not present. What this change is, or how or when it occurs, is not known, and therefore the rule is to dilute and boil the solution and allow it to partially cool to see whether there be any precipitation before the urine is added. And if there be a precipitation, to discard the solution for one more recently made. The writer knows of several instances in which the solution has remained perfectly good during several years, but also knows of many more instances wherein the same solution made from the same materials by the same formula, spoiled in a few months, and considerable quantities had to be thrown away.

To supply a solution which will certainly keep for any length of time, with accurate directions for using it, so that in ordinary inexpert hands it may not only be a trustworthy qualitative test for glucose, but approximately indicate the quantity of glucose present where the proportion is small,—is the object of this note. And the design is to treat the application of the test in such detail that any physican, pharmacist, student or trained nurse can follow the process step by step, and with a moderate number of trials reach results that are trustworthy and useful, though not critically accurate. This will not in all cases obviate the necessity for accurate examinations by experts, but will merely render such examinations infrequent, and serve to indicate when they are necessary. In all modern treatment of disease by well-trained physicans the careful watching of the urinary excretion is regarded as a prime necessity. Then, if this can be done, by processes which are simple and easy, with results close enough to be all that is practically needed in the large majority of cases, much time, labor and skill are saved, while the more complex and accurate processes which require expert skill are still in reserve for the small number of cases that require them.

As long practiced by the writer, and now to be described, any physican, pharmacist, student or trained nurse can, after a few trials, apply this test for glucose, and thus the physican's time may be saved by delegating the testing to any such assistants as he may have. But no one should be discouraged in the applications by a few failures at first, since everything worth knowing has to be learned through failures.

The formula used for many years by the writer for making Fehling's Solution is published in "Volumetric Analysis," by Francis Sutton, F. C. S., F. I. C., Phila. edition of 1882, p. 256. It is as follows:

For the Solution of Cupric Sulphate: Purified sulphate of copper in granular crystals, air dried, is best adapted to this use. Weigh 69.28 grammes of the salt, dissolve it in a litre flask in about half a litre of distilled water, add 1 c. c of pure sulphuric acid and then distilled water to made the whole measure one litre at the ordinary work-room temperature. Transfer this to a stock bottle, and label it "Solution of Cupric Sulphate for making Fehling's Standard Copper Test Solution."

For the Solution of Alkaline Tartrates: Weigh 350 grammes of recrystallized sodio-potassic tartrate or Rochelle salt, put it in a litre flask and dissolve it in about 700 c. c. of distilled water. Filter the solution if necessary, and having returned it to the litre flask, add to it a clear solution of 100 grammes of caustic soda in about 200 c. c. of distilled water and make the whole measure a litre at the ordinary work-room temperature, by adding distilled water. Transfer the solution to a stock bottle, and label it "Solution of Alkaline Tartrates for making Fehling's Standard Copper Test Solution."

When ordinary sulphate of copper and Rochelle salt are dissolved in hot water and the solutions filtered hot and stirred while cooling, the salts are deposited in granular crystals, which are easily drained, washed and dried. Such purified salts make solutions which do not need filtration; and such only should be used for making Fehling's solution. The solution of caustic soda cannot be filtered, but must be allowed to settle clear. This is best done by making twice the quantity needed, and when clear, pouring off one-half for present use; and by adding a similar quantity of soda and water to the remainder and setting it aside, after solution, it will be ready for the next making.

These solutions of Cupric Sulphate and Alkaline Tartrates when mixed in equal volumes make Fehling's solution, of which each c. c.

will contain 0·03464 gramme of cupric sulphate, which, under definite conditions, practically represents 0·005 gramme of pure anhydrous dextrose, glucose or grape sugar.

This Fehling's solution, diluted with an equal volume of water, may be boiled without change. But the addition to it of a very minute proportion of glucose causes a proportionate decomposition, and the final separation and deposit of suboxide of copper nearly proportionate to the glucose added.

In order to be in trustworthy readiness for use at all times, no matter how rarely or how frequently they may be wanted, the two solutions are put up separately. A 4 fluidounce=120 c.c. glass stoppered bottle of each solution, is put up in a pasteboard case with two test tubes and a 1 c.c graduated pipette divided to fifths of a c.c., the bottles and case properly labeled, and having the following directions for use pasted on the box as a reminder to each person at the time he may use the test:

Application of Fehling's Solution.

Put into the test tube in the following order: First, 1 c.c. of the copper solution;—next, 1 c.c. of water;—next, 1 c.c. of the solution of alkaline tartrates, and finally another 1 c.c. of water, and shake the mixture without applying the finger to the mouth of the test tube.

Boil the solution by holding the tube in an inclined position—first, *over* the small flame of a spirit or gas lamp, and when well heated, but not yet boiling, by holding only the side of the tube to the side of the flame.

After cooling for a minute or two the solution should remain perfectly transparent, and of the original sapphire blue color.

Then add 1 c.c. of the urine to be tested, mix well and boil the mixture with the same precautions as before, to prevent explosive boiling and loss of the test.

If the urine contains 1 p.c. or more of glucose, the liquid will lose its transparency and become of a dirty, greenish color as soon as it boils.

If it contains 0·25 p.c. of glucose it will usually remain transparent during the boiling, but the color becomes a lighter, dingy blue, with a greenish tinge. On cooling, during five or ten minutes, it assumes a dirty green opalescence and deposits suboxide of copper.

If it contains 0·1 p.c. of glucose it will remain transparent, or nearly so, of a light, dingy blue color, for half an hour to an hour after boiling and then become cloudy, the clouds being of a dirty, greenish color. On longer standing the cloudy portions settle and leave a transparent blue solution above, and a minute quantity of reduced copper will be visible at the bottom of the tube.

Normal urine, or that which contains only a normal amount of glucose or other reducing agents, remains transparent throughout,—or very nearly so, but has the color changed to a somewhat inferior blue. This blue will, in many instances, have a greenish tinge, and a greenish fluorescence when seen by reflected light, but there will, in twenty-four hours, be no deposit of suboxide of copper visible to the naked eye.

As a quantitative estimation the above statements are roughly approximative only. The two solutions are accurately made, however, and when put together in exactly equal measures make the improved Fehling's solution as given in "Volumetric Analysis" by Sutton, 4th edition, Phila., 1882, p. 256,—each c. c., under definite conditions, being equal to 5 milligrammes of glucose. Hence the 2 c. c. taken for the above testing are equivalent to the 0·01 gramme of glucose, and that amount in 1 c.c. of urine is just 1 p. c.

Although as full and definite as is easily practicable, some explanation in detail seems almost necessary to an understanding of the application. The mixture when first boiled is, of course, Fehling's solution diluted with an equal volume of water. In measuring, the point of the pipette is dipped successively into the liquids, and the object of the prescribed succession is that the pipette may be well rinsed with the water between the dippings into the solutions, and that all of each measure of each solution may be transferred, by the rinsing, into the test tube. The copper solution is, of course, the most important to be kept accurate and free from all admixture, and hence it is measured first, when the pipette is perfectly clean and dry.

The proper and convenient use of the pipette is a matter of considerable importance, and although minim pipettes as well as c.c. pipettes have long been in use by means of rubber tips, for dosing medicines, etc., yet, it is believed, that very few persons use them in the best way. Hence it may be useful to describe the best way:

Each pipette is supplied with a rubber tip,—or unperforated rubber nipple,—which fits over the upper end of the pipette, air-tight, but not so tightly as to prevent being easily slid up and down upon the upper end of the pipette. This movement up and down is rendered smoother and easier by dipping the narrow end of the rubber into water before putting it on the tube. When the pipette is to be used, the rubber tip thus wetted is pushed onto the pipette as far as possible or until the end of the pipette is up to the very top of the nipple. Holding the body of the pipette in the left hand the point is dipped into the liquid to be measured. Then with the right thumb and forefinger the nipple is compressed upon the glass tube, forcing the contained air out through the liquid. The nipple is then set free and allowed to expand, when the liquid will rise in the pipette to a height proportionate to the amount of air expelled, and thus the pipette is partly filled. To complete the filling up to the 0 mark the thumb and finger of the right hand are applied to the lower end of the nipple, where it clasps the pipette air-tight, this lower end is thickened into a ring-like band of rubber, and by grasping this with the thumb and finger it can be easily screwed upward upon the pipette without admitting any air. As it is carefully screwed upward, of course the liquid will rise in the pipette, and thus the exact measure or mark may be accurately reached, just as by moving up the piston of a syringe. When the desired mark,—say the upper, or 0 mark is reached, the pipette is removed from the liquid and carried to the vessel that is to receive the accurately measured quantity. By this time a drop or a part of a drop will be hanging from the point; but as this was not there when it left the liquid, and is the result of the expansion of the air inside from the warmth of the fingers, it belongs to the quantity to be measured. The nipple is now screwed downward on the pipette just as it was screwed upward in filling, until the liquid inside falls to the mark of the desired measure. If it gets all the way down before the mark is reached, then the nipple must be compressed cautiously until the required delivery is completed and the hanging drop is taken off the point by touching the point against the side of the receiving vessel. Then the nipple is allowed to expand again, for the air will pass in without any more liquid escaping. If the whole contents of the pipette are to be delivered at once into the receiving vessel, this is best done either by compressing the nipple or by screwing it entirely off of the top of the pipette, thus allowing all the charge to run out. Then by draining down for a moment, and taking off the last drop or part of a drop by touching the point of the pipette against the side of the receiving vessel, the measured quantity will be pretty accurate. All pipettes are so-graduated that the minute quantity of liquid which remains in the capillary portion of the lower end does not belong to the measured quantity.

Of course the management by which the pipette is partly filled to any of the lower marks of its graduation is exactly the same, so that the operator can measure his quantities either way.

If the pipette be quite clean there is no risk, and considerable convenience in dipping it directly into the bottle and drawing the charge from that as long as it will reach the surface of the liquid. But when the liquid gets too low in the bottle to be easily reached, it must be poured out into a clean test tube or other vessel, and be measured from that. In the use of the pipette in measuring from a test tube, or a vial as in dosing medicines, it is often very convenient to have it passed through a perforated cork or through a short section of rubber tubing, which may fit the test tube or vial as a cork. Then the vial is held in the left hand, and the adjustment made with the right.

Of course to those who are expert in the ordinary use of pipettes no means of charging is so good as suction by the lips, but to do this, especially with short tubes, requires very considerable experience and dexterity,—an amount of skill not generally acquired by physicans, pharmacists and nurses; while comparatively few trials with the rubber cap will enable any one to do fairly accurate work with it.

The boiling of solutions in narrow test tubes without loss and without scattering the liquid over everything is not an easy thing to do, but in one way it can be done with ordinary care. The tube is held by a folded strip of paper half an inch wide, passed round it near the mouth, the two ends of the strip coming together where they are held by the thumb and finger. A small flame is much safer and better than a large one, and the heating should not be hurried. The tube should not be over one-third or one-half full, and should be held inclined. At first the whole of the filled portion may be passed to and fro through the flame and over it, taking care to heat the upper portion most. When pretty well heated but not enough to approach too closely to boiling, it is no longer held in the flame but at the side of it, so that the side of the tube just touches the side of the flame. In such a position it is passed backward and forward, —first one side and then the other, still holding it longest to the flame near the surface of the liquid so that the upper portion of the liquid boils first. When the surface portion begins to boil, then make the remainder of it boil successively down to the bottom, until finally bubbles of steam are given off from the very bottom. With a little caution, gentle boiling may in this way be kept up for any desired length of time, but in this test it is only necessary that the liquid should fairly boil. The explosive boiling, which is so liable to shoot a part or the whole of the liquid out of the tube, is very annoying, and the writer has never found any way of avoiding it that is more satisfactory than the one here described. Small bits of platinum, or better still small bits of common clay tobacco pipe render the boiling more safe, but in this test they somewhat obscure the results, while they introduce a complication.

Applied with moderate care in this way, as a qualitative test, Fehling's solution is entirely trustworthy for any proportion of glucose in ordinary urine, below a quarter of one per cent.; and a proportion much less than this is of comparatively slight importance unless it be persistent, since it may accidentally occur in the urine of healthy persons from errors of diet, etc. But it is these small proportions where they are persistent that it is most important to determine, and to watch their changes, as well in cases which are terminating favorably as in those which are just commencing and to be taken when in the most manageable stages. Therefore the writer undertook to make the test roughly approximative as a mode of quantitative estimation, and thus increase its sphere of usefulness to the physician in ordinary general practice.

Normal urine taken at various times in the 24 hours, and used of various ages up to 48 hours, or incipient decomposition;—of various specific gravities from 1.016 to 1.027;—used both in the natural acid condition and rendered alkaline by solution of potassa,—was used for these determinations. To such urine proportions of glucose were added, varying from one-tenth of one per cent. up to four per cent., and with these the observations were made, the results of which are given above, each observation being repeated several times with various specimens of urine, and the description was made to apply to an average of the observations. The only disturbing element in the conclusions reached is that no diabetic urine was tried at this time, though the writer has not unfrequently examined diabetic urine at other times. Hence, although it is not generally safe to draw nice conclusions from artificially prepared bases, it is believed that these are quite accurate enough and safe enough to be practically very useful, at least in determining when more critical examinations are necessary.

In all examinations the prescribed quantity of 2 c.c. of the test, diluted with 2 c.c. of water should be adhered to, and the first trial should be made with 1 c.c.=16 minims of the urine to be tested. Cases are recorded in which the proportion of grape sugar in diabetic urine reached 7 or 8 p. c., but it is perhaps rare for the proportion to exceed 4 p. c.

When 1 c.c. of urine which contains 4 p.c. of glucose or grape sugar is added to 2 c.c. of freshly made Fehling's solution, diluted with 2 c.c. of water, the color of the mixture will generally change, and its transparency be lost in a minute or two, before being heated. Warming hastens the reaction, and boiling gives first a greenish yellow, and on cooling a heavy brown precipitate and a brown supernatant liquid.

The same quantities and conditions with urine containing 2 p.c. of glucose gives a dingy yellow mixture on boiling. On cooling a copious dingy yellow precipitate settles out, leaving a transparent yellow supernatant solution.

With urine containing 1 p.c. of glucose the reaction does not occur until the liquid is nearly boiling, and the mixture then becomes of a light dingy yellowish green color, and loses its transparency. No blue tint remains, and but a very light dingy green, showing that all,—or very nearly all the copper salt present has been reduced. This is, of course, as it should be, since the quantity of solution taken is just equal to 1 p. c. of glucose. On standing for an hour or two the characteristic yellow suboxide of copper is all collected at the bottom of the tube, but much dirty greenish flocculent matter remains in suspension, with a transparent stratum at the surface. In a few hours this transparent portion will have increased so as to be more accurately observed. If it has a blue tint then the amount of glucose present is less than 1 p.c. in proportion to the depth of the blue tint. If the amount be 1 p.c., or more than 1 p. c., there will be neither blue nor green tint, but only yellow, but the flocculent portion below may be greenish.

With urine containing ·5 p.c. of glucose,—or rather with ·5 c.c. of urine containing 1 p. c. of glucose,—the reaction occurs about the boiling point, and on boiling the whole assumes an intransparent dingy green appearance. On cooling and standing for a longer or shorter time, the precipitate all goes down and leaves a transparent blue solution, but inferior in both the color and the depth of color to the original sapphire blue. That is to say, half of the copper salt has been reduced.

With the same quantity of the test solution and ·25 c. c. of urine containing 1 p.c.—which is nearly equivalent to 1 c.c. of urine containing ·25 p. c. of glucose,—the reaction does not usually occur on boiling, but the color changes materially. On standing for a minute or two the whole becomes greenish and intransparent. Later it settles, leaving a deep blue transparent solution above.

Urine containing ·1 p. c. of glucose gives a distinct reaction as before described, but not until the mixture cools.

Different specimens of normal urine vary considerably in their reactions with the test. Some degree of reaction was perceptible in every specimen tried, and the variation extended between the limits of producing a mere slight change of color and of giving a dingy opalescence after standing an hour or two. In the latter case, after standing 24 hours, there was a separation into a small flocculent greenish stratum below and a large transparent deep blue portion above. With a glass a few particles of suboxide of copper were seen at the bottom of the tube. The average trials of normal urine, however, gave only a slight change of color, and in 24 hours the flocculent matter which had separated was redissolved and no visible precipitate.

When the test is applied as described, using 1 c.c. of urine, it will be at once seen whether there be glucose present or not. And if present, whether the proportion is above or below 1 p.c. If above 1 p.c., then ·5 c.c. of the urine should be used for the next trial. If this should discharge the blue color entirely, then ·2 c.c. or ·1 c.c. of the urine should be taken for the third trial.

If the proportion be below 1 p.c. the quantity of urine taken may be doubled; or may be subdivided, as in the other case, until the reaction reaches that degree described as indicating say, 1 p.c.

The pipette supplied with the test case is divided to ·2 c.c. for the purpose of making these subdivisions of quantity of urine, and therefore can be read to ·1 c.c., or half a division with sufficient accuracy. The pipette is not very accurately made, but is correct to within ·1 c.c. in the whole capacity, and this is quite close enough for the purposes of this test; and when this is the case it is a waste of money to pay for greater accuracy than is aimed at, or attained, in other steps in the application of this test. The subdivisions are found to be very useful in watching the increase or diminution of the proportion of glucose, in the progress of cases and the effect of treatment. For example, where the proportion of glucose is small ·5 c.c. of urine is taken as the regular test for comparison from time to time. When it is larger ·2 c.c. will be found better, and when largest ·1 c.c. may be sufficient for a close observation of the changes. And it should be remembered that the smaller changes thus observed have no significance unless the whole quantity of urine for the twenty-four hours in which the test is made, be mixed and carefully measured. The two 4 fluidounce bottles make enough solution for about 120 applications of the test, and the case complete should not cost the physican over a dollar and a half under ordinary circumstances.

In that watching of the urine wherein negative results are generally obtained, a case of solution will, in ordinary practice, last for years perhaps, and it is only in the comparatively rare diabetic patients where much will be used. For such uses it might easily be put up in double quantity at a comparatively small additional cost, since it is the case, bottles, pipette, etc., which make up for the largest proportion of the cost.

The ground glass stoppers should in all cases be paraffined, otherwise they will soon become so fixed in the long intervals of ordinary use that it will be difficult to get them out. With this and a few other precautions that would naturally suggest themselves, any one can put up these solutions, and perhaps some will improve on the plan of the writer as here given.

THE PHARMACOPŒIA OF 1880.

(Review continued.)

ACIDUM LACTICUM.

LACTIC ACID.

A liquid composed of 75 per cent. of absolute Lactic Acid, [$HC_3H_5O_3$; 90.—$HO,C_6H_5O_5$; 90], and 25 per cent. of Water.

Lactic Acid should be preserved in glass-stoppered bottles.

A nearly colorless, syrupy liquid, odorless, having a very acid taste and an acid reaction. Sp. gr. 1.212. It is freely miscible with water, alcohol, and ether, but nearly insoluble in chloroform. It is not vaporized by a heat below 160° C. (320° F.); at higher temperatures it emits inflammable vapors, then chars, and is finally entirely volatilized, or leaves but a trace of residue.

When diluted with water, Lactic Acid should afford no precipitate with test-solutions of nitrate of silver (hydrochloric acid), chloride of barium (sulphuric acid), sulphate of copper (sarcolactic acid), nor with sulphide of ammonium after addition of excess of water of ammonia (lead, iron). It should not reduce warm test-solution of potassio-cupric tartrate (sugars). When mixed and heated with excess of hydrated zinc oxide, and extracted with absolute alcohol, the latter should not leave a sweet residue on evaporation (glycerin). Cold, concentrated sulphuric acid shaken with an equal volume of Lactic Acid should assume at most only a pale yellow color (organic impurities).

To neutralize 4.5 Gm. of Lactic Acid should require 37.5 C.c. of the volumetric solution of soda.

Preparation: Syrupus Calcii Lactophosphatis.

The above definition and description are very much improved and extended, and are now perhaps all that can be needed or desired, and a moderately critical application of the tests will secure a good quality of acid. One property of the acid not mentioned which it is very useful to know, is that it is very hygroscopic, and when exposed to the air it increases in weight and diminishes in strength pretty rapidly by attracting moisture.

So far as the writer knows this acid is very little used in medicine, and is never made in this country. Two or three German makers appear to supply the entire demand, and one of these makers supplies more than all the others together. Indeed it often occurs that this make is the only one accessible. Under these circumstances it seems to be impossible now to get this acid of the strength required by the Pharmacopœia. The quality is good, but the strength deficient. Two purchases of it made within the past year gave the following results:

Specific gravity compared with water at 4° C., and weighed at 15° C.=59° F. 1.220. Weighed at 25° C.=77° F. 1.212. Assayed by volumetric solution of soda it gave 71.8 p. c. of absolute acid. This acid fulfills all the requirements of the Pharmacopœia, except that it exceeds the officinal s. g., but is 3.2. p. c. short in strength. Therefore the officinal s. g. does not agree with its required strength. The second purchase gave a s. g. of 1.186 at 15° C.=59° F. and 1.178 at 25° C.=77° F. And by assay 68.5 p. c. of absolute acid.

Thus it appears that in using the best acid that is obtainable in the market here, care must be taken to ascertain the strength and to vary the quantity accordingly. And should it be retained in the next revision, it should be re-examined for s. g. and strength, and the description be modified to accord with the best that can be obtained.

It is not an important therapeutic article, and seems to be gradually falling into disuse.

ACIDUM OLEICUM.

OLEIC ACID.

$$HC_{18}H_{33}O_2\ ;\ 282. — HO,C_{36}H_{33}O_3\ ;\ 282.$$

A yellowish oily liquid, gradually becoming brown, rancid and acid, when exposed to the air; odorless or nearly so, tasteless, and, when pure, of a neutral reaction. Sp. gr. 0.800 to 0.810. Oleic Acid is insoluble in water, but completely soluble in alcohol, chloroform, benzol, benzin, oil of turpentine and the fixed oils. At 14° C. (57.2° F.) it becomes semi-solid, and remains so until cooled to 4° C. (39.2° F.), at which temperature it becomes a whitish mass of crystals. At a gentle heat, the Acid is completely saponified by carbonate of potassium. If the resulting soap be dissolved in water and exactly neutralized with acetic acid, the liquid will form a white precipitate with test-solution of acetate of lead. This precipitate, after being twice washed with boiling water, should be almost entirely soluble in ether (abs. of more than traces of palmitic and stearic acids). Equal volumes of the Acid and of Alcohol, heated to 25° C. (77° F.) should give a clear solution, without separating oily drops upon the surface (fixed oils).

Just now this acid seems to be an important addition to the Pharmacopœia, and a good description and tests much needed. But those given above which are most definite and most characteristic do not apply to the Oleic Acid, which is generally accessible, and which has been exclusively, or almost exclusively, used in this country since the oleates were introduced here. And if this description and tests is to apply in future, the entire practice must be revolutionized, and this writer does not know of such an oleic acid, nor where it is to be obtained. Both the pharmacy and the therapeutics of the acid and the resulting oleates have been based on a substance which, though comparatively easily obtained, would not be admitted to use under the officinal description and tests, and yet upon this substance almost, if not all the medicinal results have been obtained thus far.

When the oleates first attracted much attention here the Chairman of the Committee of Revision of the Pharmacopœia of 1880, published in The American Journal of Pharmacy for January, 1873, vol. xlv., p. 2, a process for obtaining Oleic Acid of sufficient purity for these externally applied oleates, from the commercial acid or "Red Oil" of the candle-makers. And this process, with slight modifications by the writer and others, has been followed ever since, and has supplied all, or nearly all the acid used in medicine up to this time. The authority for this statement, is that the writer believes himself to have been much the largest user of oleic acid in this country up to a late date. Having commenced to make the oleates from this acid in 1871 when a single barrel of the acid satisfied the demand for a year, these oleates, without the least advertising or drumming of any kind, have steadily increased in use until this year, when fifteen barrels was insufficient, and many orders for the acid in large quantities, to supply other makers of oleates, had to be declined. Only within the past year or two has the demand for oleates been sufficient to attract the attention of "the trade," and now that they are being largely advertised the writer does not know what acid is being used, except that he has freely told every one who has asked, the source of his own supply, and his method of purification—and except that he has supplied several makers of oleates.

The candle-makers use all sorts of fats, good and bad, that will yield them a firm, solid, stearic acid, and many of these fats they buy cheaply in the form of various kinds of refuse, and they continue their process all the year round. Much of the fat is rancid when they use it, and all through the summer it is all apt to be more or less rancid. But they do not get enough scrap fat, and inferior stock, and often have to use good fresh and sweet fats. By only going to them in cold weather, and by watching for opportunities when they are working on good materials, and by paying full prices for a little extra pains, cleanliness, etc., a crude acid can be had in any quantity that is quite proper for medicinal uses. This is the best, and perhaps exceptional quality, of the "Red Oil" of the market, and when this is distilled in a current of superheated steam, it becomes a pale brownish yellow oily liquid, transparent at summer temperature, but at 15° C.=59° F. it deposits about half its volume of crystalline white palmitic or margaric acids. The transparent portion separated and subjected to a temperature of about 10° C.=50° F. deposits an additional portion of the solid acids. These, when carefully filtered out at or below this temperature, leave the oleic acid which has been used and sold by this writer.

It is a pale brownish yellow, oily liquid, varying in depth of color between that of pale and ordinary sherry wine, sometimes as deep in color as almond oil, and it becomes slightly browner by age. Thus far it practically agrees with the Pharmacopœia description. But it is never neutral to test paper, but always acid, and it does not become rancid and acid to any considerable extent by any ordinary exposure. A specimen exposed to the air in a shallow basin for two or three weeks, changed very little in sensible properties, and in its action on litmus paper. A little oxyoleic acid was present at first, and probably increased a little, but 1 c.c. of 10 p.c. solution of ammonia in 50 c.c. of water, shaken with 50 c.c. of the oleic acid, deprived it of its acid reaction, both in that portion which had been exposed and that which had not. Therefore, the proportion of oxyoleic acid must be so small as to be insignificant, and yet is sufficient to give an acid reaction always.

This oleic acid is not "odorless or nearly so," but has a peculiar distinct odor that is not that of rancid fat, but is suggestive of that odor, though it is not disagreeable to most persons, and the taste is like the odor, but it is not the acrid, almost pepper-like taste of rancid oils, though it gives a distinct after-taste of acridity in the fauces. The s.g. compared with water at 4° C. is not "0·800 to 0·810," but is ·8955 at 15°C.=59° F., and ·8896 at 25° C.=77° F. It is completely soluble in alcohol, but the other solubilities stated were not tried. "At 14° C. (57.2° F.)" it does not become semi-solid, but remains transparent at 4° to 5° C. It may not be of any great disadvantage to the oleic acid for medicinal uses, to leave in it the very considerable amount of palmitic, margaric or other acids of higher melting points permitted by this test, but the test simply rules out an oleic acid which has less of these other acids in it. The small proportion of oxyoleic acid doubtless lowers the solidifying point of all the fatty acids, but not to a very great extent. The oxyoleic acid is also objectionable therapeutically, because it is an irritant, and therefore there should be a limit set to the amount which is permissible.

The test given for the absence of more than traces of palmitic and stearic acid will never be satisfied by any oleic acid which the writer has ever seen which becomes semi-solid at 14°C.=57.2° F., since all the solid portions at this temperature are margaric or palmitic acids. Another point which invalidates this test is that a soap made with a carbonated alkali as directed, without boiling, will always give a precipitate with acetate of lead, which will contain carbonate of lead, and this of course not being soluble in ether, would be accepted as palmitate or stearate of lead, when neither the one nor the other was present.

The principal differences between the oleic acid which has hitherto been used and that now required by the Pharmacopœia are, the odor, taste, acidity, specific gravity and solidifying point. And the greatest of these differences is in specific gravity. All the others may be understood as being differences between a chemically pure acid and one that is less pure, and the question would be whether a chemically pure substance was needed for these external uses, after all the experience made with the oleates has been from an acid which, though of good quality, is not chemically pure. But the very great difference in specific gravity must mean more than this, and it led the writer to make the following investigations:

On referring to authorities, it was found that Gmelin quotes Chevreul as his authority, and gives ·898 at 19° C. Watt's Dictionary of Chemistry also quotes Chevreul, but gives ·808 at 19° C. In Wurtz Dictionnaire de Chimie, the article on oleic acid is written by P. Schutzenberger, and gives ·808 at 19° C. Other authorities seem to copy almost exclusively the latter figures, and the temperature being the same, it seems probable that all come down from Chevreul who wrote 70 years ago, and that some one has made a mistake. Allen, however, gives ·900 to ·905 for Commercial Oleic Acid.

A specimen bottle of German Oleic Acid from a very good maker, costing, wholesale, $11 per pound,—not labelled "C. P.,"—was carefully examined in comparison with the above mentioned acid from Red Oil. It was of the color of pale sherry,—not lighter than the best specimens from Red Oil,—had the same peculiar odor and the same acid reaction. The s. g. under the same conditions of standard and temperature was ·8923 at 15° C.=59° F. and ·8864 at 25° C. =77° F.; and it answered all the other tests of the Pharmacopœia as well, but no better than the Red Oil acid, and in all probability it contained quite as much oxyoleic acid.

Cottonseed oil, olive oil, refined lard oil and almond oil were then each saponified, the soaps decomposed by tartaric acid, and the oleic acid separated from the other fatty acids in all, except the cottonseed product. This contained so little oleic acid that it was not separated.

The work was not done with critical accuracy, but only with practical accuracy, such as would be applied on a manufacturing scale, and the results were briefly as follows:

The olive oil gave an oleic acid which was almost odorless,—was neutral, and when sufficient palmitic acid was left in it, was semi-solid at 14° C., but the proportion of palmitic acid to produce this was very considerable, so that a large proportion of the lead salt was insoluble in ether. The s. g. at 15° C.=59° F. was ·9026; at 25° C. =77° F. it was ·8964. The s. g. was taken with enough palmitic acid in it to be not quite transparent at 15° C.=59° F.

Refined lard oil of very good quality gave an oleic acid which was perceptibly different in some sensible properties from the acids from the olive and almond oils. The difference is, however, difficult to describe. It felt a little smoother and softer to the touch, and a little of it seemed to spread over greater surfaces, and it seemed that the hands became dry more quickly when wetted with it. Some comparative trials of the rate of absorption were made, but they were not accurate enough or definite enough to be stated. The lard acid was nearly odorless, but not tasteless, and gave the irritant acrolein-like impression or after-feeling in the fauces. It was neutral to litmus paper, and only lost its transparency when cooled to 5° C.=41° F. The s. g. at 15° C.=59° F. was ·9041; and at 25° C.=77° F., ·8976.

The mixed acids from the almond oil when cooled to 8° C.=46.4° F., and the oleic acid filtered out at that temperature, gave an acid of a rich, deep brownish-yellow color, deeper than that of the oil from which it was made, and deeper than any of the other acids. It was nearly odorless and tasteless, and not quite neutral to litmus paper. It remained entirely transparent at 4.4° C.=40° F., and was not cooled lower than this. Its s. g. at 15° C =59° F. was ·9100; at 25° C.=77° F., ·9039. This acid was then again saponified with caustic soda, and a lead salt made from it by decomposition with solution of acetate of lead. The washed lead salt was exhausted by ether,—the ethereal solution filtered, and the ether distilled off in a water bath gradually heated to boiling, and boiled actively for half an hour. The acid was then of a pale yellow color, but had a fatty odor. Transferred to a flask which it filled to the middle of the neck to diminish contact with the air, it was then heated in a sand bath to 210° C.=410° F. At about 100° C. vapor was given off with the appearance of gentle boiling, and this boiling continued to the end of the heating, diminishing as the temperature arose, and had not entirely ceased, but nearly so, when the heating was discontinued. The vapor given off had at first a slight odor of ether, and afterward seemed to be mainly steam with a fatty odor. Toward the end of the heating a visible vapor came off with an odor suggesting acrolein, and as this evidence of decomposition became distinct and unmistakable the heating was arrested before the bubbles of vapor had entirely ceased to arise from the bottom and sides of the flask. The flask was then corked and cooled. During the heating,—which required about an hour and a quarter for about 150 grammes of the acid,—the color became much deeper, so that the acid was much deeper in color than the original almond oil, and quite brown; and the volume was reduced by 5 to 8 p.c. (estimated). The s. g. at 15° C.=59° F. was ·8984, and at 25° C.=77° F., ·8917.

When cooled down to 3.4° C=38° F. it congealed at the surface first, and during the congelation the temperature rose to 5.2° C.=41.4° F., and the whole became a soft solid mass from which no liquid would flow.

A part of the same acid which had been saponified only once, as before mentioned, the soap decomposed with tartaric acid in excess, and the resulting mixed acids separated by cold at 8° C.=46.4° F. when cooled remained perfectly transparent to 2.5° C.=37° F., and then began to crystallize in distinct white groups on the sides and bottom of the flask. These groups were few and small, and the mass of acid did not crystallize at that temperature. It was therefore concluded that these small groups were palmitic acid crystallizing out. Each then stood for eight hours at a temperature of 3° C.=37.4° F. when the last portion was filled with crystals, though still liquid, and had a temperature of 4.6° C. The portion which had been resaponified, ether extracted and heated, was so nearly solid that the thermometer could only just be pushed through the mass, and its temperature was 4.4° C.

The marked difference in s. g. of this acid, before and after the second saponification, is doubtless partly due to the palmitic acid present in the first, and entirely absent in the last portion. But the boiling off of so much vapor in the heating of the latter portion, and the considerable reduction in quantity, leads to the inference that before heating the acid is a hydrate, and by heating parts with a molecule of water. If this be the case, the difference in s. g. before and after heating would be accounted for.

These data show conclusively that all the authorities referred to give a very erroneous s. g. for oleic acid, excepting Gmelin, while this, as well as the other authorities, quote from Chevreul; and it is not at all strange that the Pharmacopœia should have fallen into this very popular error. It seems pretty clear, too, how the error occurred. Some printer or copyist has probably made Chevreul's ·898 into ·808,—not a difficult thing to do, especially when the old style figure 9 is used, as it may have been seventy years ago. It is rather curious that no redetermination of this s. g. has reached the prominent authorities referred to, since doubtless such redeterminations of so important a substance must have been often made.

The Pharmacopœia is, however, wrong in its temperatures of solidification, since by these it permits a large proportion of palmitic acid to be present in the oleic, and afterward gives a hypercritical test for excluding palmitic acid almost entirely.

Not one of the specimens of oleic acid made for this investigation was either pale yellow in color, or was nearly odorless or tasteless, and the after taste, in the fauces, was in all cases very pronounced.

The general practical conclusion reached here is that for medicinal uses a well prepared oleic acid from Red Oil is unexceptionable and should be continued in use, and the writer will still continue to use it, although he, with all others who do use it now, must state on the label that it is *not* the Oleic Acid of the U. S. P. of 1880. Then those who can get an acid which will answer the officinal tests will of course not take this, nor be liable to be deceived by it.

It is possible and perhaps even probable that oleic acid from animal fats is better for use in the animal economy than one from vegetable fats, for the same reason that ointments have always been made from animal fats rather than vegetable. But this has been neither proved nor disproved. It is, however, a more important question now than ever before, since the most important use of oleic acid now is, as a vehicle for the introduction of medicinal agents into the circulating fluids within, to affect the general economy. As local agents for the treatment of external and local affections, such as diseases of the skin, the question of the most prompt and rapid absorption is of comparatively little consequence. But when quinia, morphia, mercury, etc., are to be introduced into the blood for general therapeutic effect, the most prompt and rapid absorption is very important. And, from this point of view, if the oleates are even moderately successful, as they now appear to be, their utility has as yet only begun to be realized in medicine.

The rapidity with which they are absorbed from the surface of the body is certainly very remarkable, and seems to vary very little in different portions of the skin, but varies very much in different conditions of health and disease. A moist skin, and especially the leaky skin of collapse, or of low vitality, and a sweating surface, absorb oleates badly or not at all ; and from this condition to that of the very prompt absorption of health, there are, of course, all possible degrees of activity and inactivity.

ACIDUM PHOSPHORICUM.

PHOSPHORIC ACID.

A liquid composed of 50 per cent. of Orthophosphoric Acid [H_3PO_4 ; 98.—$3HO,PO_5$; 98], and 50 per cent. of Water.

Phosphorus, *sixteen parts*	16
Nitric Acid,	
Distilled Water, each, *a sufficient quantity.*	
To make *one hundred parts*	100

Mix *one hundred* (100) *parts* of Nitric Acid with *one hundred* (100) *parts* of Distilled Water, in a glass retort having the capacity of *four hundred* (400) *parts*. Having placed the retort upon a sand-bath or wire-gauze support, connect it loosely with a well-cooled receiver and add to the acid in the retort the Phosphorus, previously cut into fine pieces. Insert a funnel through the tubulure of the retort, and then gradually apply heat until the reaction is seen to commence. Regulate the heat carefully so as to prevent the reaction from becoming too violent, or, if necessary, check it by the addition of a little Distilled Water through the funnel. From time to time return the acid liquid, which collects in the receiver, into the retort, until all the Phosphorus is dissolved. Then transfer the liquid to a weighed porcelain capsule and continue the heat, at a temperature not exceeding 190° C. (374° F.), until the excess of Nitric Acid is driven off, and an odorless, syrupy liquid remains. Cool the dish and contents, and add enough Distilled Water to make the liquid weigh *one hundred* (100) *parts*.

Test small portions for Nitric, Phosphorous, and Arsenic Acids by the methods indicated in the note.

If Nitric Acid be present, evaporate the liquid until no reaction for Nitric Acid can be obtained. Then cool the Acid and add enough Distilled Water to make the product weigh *one hundred* (100) *parts*

If Phosphorous Acid be present, add to the liquid a mixture of *six* (6) *parts* of Nitric Acid and *six* (6) *parts* of Distilled Water, and again evaporate until no reaction for Phosphorous or Nitric Acids can be obtained. Then, having cooled the Acid, add enough Distilled Water to make the product weigh *one hundred* (100) *parts*.

If Arsenic Acid be present, dilute the Acid with *one hundred and fifty* (150) *parts* of Distilled Water, heat to about 70° C. (158° F.) and pass through the liquid a stream of hydrosulphuric acid gas for half an hour, then remove the heat and continue passing the gas until the liquid is cold. Close the vessel tightly, set it aside for 24 hours, filter the liquid, heat it till all odor of the gas has been driven off, again filter and evaporate until the residue weighs *one hundred* (100) *parts*.

Preserve the product in glass-stoppered bottles.

A colorless liquid, without odor, of a strongly acid taste and reaction. Sp. gr. 1.347. When heated, the liquid loses water, and when a temperature of about 200° C. (392° F.) has been reached, the acid is gradually converted into pyrophosphoric and metaphosphoric acids, which may be volatilized at a red heat. If the diluted Acid be supersaturated with ammonia, addition of test-mixture of magnesium produces a white, crystalline precipitate. If this precipitate be dissolved in diluted acetic acid, the solution yields a yellow precipitate with test-solution of nitrate of silver.

Phosphoric Acid, diluted with 5 volumes of water, and gently warmed, should not be blackened by test-solution of nitrate of silver, nor be turned white or whitish by test-solution of mercuric chloride (abs. of phosphorous acid); when heated to about 70° C. (158° F.), thoroughly saturated during half an hour, and afterward until it is cold, with hydrosulphuric acid gas, then set aside for twenty-four hours, it should not deposit a lemon-yellow sediment (abs. of arsenic acid). If a crystal of ferrous sulphate be dropped into a cooled mixture of Phosphoric and Sulphuric Acids, no brown or reddish zone should make its appearance around the crystal (abs. of nitric acid) After diluting the Acid with 5 volumes of distilled water, no precipitate should be produced on the addition of small portions of test-solution of chloride of barium (sulphuric acid), or of nitrate of silver (hydrochloric acid); nor should any precipitate be formed, after several hours, by the addition of an equal volume of tincture of chloride of iron (pyrophosphoric and metaphosphoric acids).

On pouring 5 Gm. of Phosphoric Acid upon 10 Gm. of oxide of lead free from carbonate of lead and from moisture, evaporating and igniting, a residue will be obtained which should weigh 11.81 Gm.

Preparation: Acidum Phosphoricum Dilutum.

This 50 p.c. Phosphoric Acid is new to the Pharmacopœia, and is a very useful addition, first, because it will serve many purposes better than the Diluted Acid: and secondly, because in time it will probably supersede the diluted form to the great saving of bottles, freight and risk of transportation. The writer has made and dispensed an acid of this strength for many years past, and a large number of persons have discovered that there is no good reason for transporting so much water, and paying for bottles to hold it, as in buying the Diluted Phosphoric Acid, when they can get an acid of five times the strengh at a proportionate cost.

In an experience of over thirty years, embracing the manufacture of many tons of this acid, upon almost every scale of quantity, the writer has used the above given process, and almost every other process which has been proposed, that appeared safe enough to warrant trial. Indeed, one process, at least, which was not safe, was tried and nearly cost him his life. The result of this experience is that although the officinal process above given will yield the acid, and is the best in its general principles, it is not the best or the most convenient in the management of its detail. Several others appear to be more easily practicable and more economical, but when tried the appearances are not realized. The management of this officinal process, which has been longest and most successfully used by the writer, is as follows:

Take of	Phosphorus	16 parts.
	Nitric Acid	about 96 parts.
	Hydrosulphuric Acid Gas	
	Distilled Water, each, a *sufficient quantity.*	

Mix 32 parts of the Nitric Acid with 36 parts of the water in a flask of three times that capacity, add the Phosphorus in its commercial condition, set the flask in a water-bath and heat the whole at the temperature of a boiling water-bath until the reaction slackens. Put the remaining 64 parts of the nitric acid undiluted into a bottle, and by means of a very small syphon or other equivalent arrangement, allow it to run into the flask drop by drop, or at a rate which just keeps up a moderate reaction, which is always controllable by the rate at which the acid is added. This moderate reaction can be kept up equally well by adding the acid at intervals, 1 or 2 parts at a time. When all has been added, the heating is continued until all, or very nearly all, the Phosphorus is dissolved. Transfer the whole to a porcelain capsule, heat it on a sand bath until the excess of nitric acid is driven off, cool and dilute with distilled water to about 128 parts, and then pass hydrosulphuric acid gas through it until it is saturated. This is best done cold, in an ordinary bottle, which is not more than three-fourths filled by it. The gas should pass through slowly and for a considerable length of time, —say three or four hours at least,—and the bottle should be, from time to time, corked and shaken. When, after shaking, the cork has a tendency to be drawn in, the saturation is incomplete ; but when the tendeney is to push it out, the saturation is complete ; and the bottle is corked and allowed to stand over night. The dilute acid is then to be filtered through paper into a flask, and the flask set into a hot water bath for several hours, or until it no longer smells of the hydrosulphuric acid gas. Then filter it again through paper and evaporate it in a tared capsule until it is reduced to about 70 parts. When thus finally concentrated it almost always has a brown tinge from particles of organic matter, which have accidentally got into it during the long process, from the paper filters or from the air. A drop or two of nitric acid added a little while before the end of the heating will discharge this color by oxidation, and the after heating will drive off the products of the decomposition and the remaining traces of nitric acid. Then cool, and dilute with distilled water until the whole weighs 96 parts, or until the acid has a s. g. of 1.347 at 15° C.=59° F. compared with water at its maximum density ; or 1.344 at 25° C.=77° F.

In practice there is a very considerable advantage in avoiding the large dilution of the whole of the nitric acid, and in adding the larger part of it little by little in its strong condition, because the reaction is more rapid and is better maintained with less attention and greater safety.

Only for a short time during the past thirty years has the writer been able to obtain Phosphorus which did not contain a very considerable proportion of arsenic, and therefore the treatment by hydrosulphuric acid gas has always been essential to the process.

The Phosphorus always has to be weighed wet, and on account of this water and the arsenic, and the small accidental losses, the 16 parts will never yield quite the 100 parts of the 50 p.c. acid required by the Pharmacopœia, but will, perhaps, on an average, yield over 96 parts.

The s. g. 1.347 given by the Pharmacopœia to indicate an acid of 50 p.c. does not agree with the Table of Schiff, given at page 424. The Table gives 1.3486 for 50 p.c. and therefore, an acid of 1.347 would contain about 49.83 p.c. As the officinal s. g. does not agree with the Table given as authority, it seemed desirable to know which was the more correct.

An acid which answered to all the tests and had a s. g. of 1.34838 at 15° C.=59° F. and 1.34290 at 25° C.=77° F. was assayed by the PbO process, as given by Fresenius, and gave 50.9 p.c. thus showing that the text of the Pharmacopœia is probably more correct than the Table of Schiff which it quotes.

The tests of quality and strength which are given are a very great improvement over former revisions and are now full and sufficient, and at the same time are simple and easily applied. This is a matter of the greater importance, because very few pharmacists or physicians will undertake to make the Acid, and must therefore depend upon the large manufacturer for their supplies.

ACIDUM PHOSPHORICUM DILUTUM.

DILUTED PHOSPHORIC ACID.

Phosphoric Acid, *twenty parts*	20
Distilled Water, *eighty parts*	80
To make *one hundred parts*	100

Mix the Phosphoric Acid with the Distilled Water.

Diluted Phosphoric Acid has the sp. gr. 1.057, and contains 10 per cent. of Orthophosphoric Acid. It should respond to the tests of purity required for Phosphoric Acid.

On pouring 5 Gm. of Diluted Phosphoric Acid upon 5 Gm. of oxide of lead free from carbonate of lead and from moisture, evaporating and igniting, a residue will be obtained which should weigh 5.36 Gm.

This is the prepartion of the last revision, only that it is increased in strength by about ·2 p.c. and is now very conveniently made from the new officinal Phosphoric Acid just considered. Some care must be taken to avoid confounding the two strengths in using, since one is just five times the strength of the other, and the stronger is called simply Phosphoric Acid.

The s. g. is as nearly accurate as can be readily determined or expressed by three decimal places, but it would have been useful both here and under the concentrated acid to have given it also at the more convenient temperature of 25° C. as is done in many cases. The s. g. at 15° C.=59° F. is 1.057, and at 25° C.=77° F. it is 1.054.

An acid having the s. g. 1.05819 at 15° C. and 1.05543 at 25° C. gave by assay a strength of 10.2 p.c.

This is the form in which Phosphoric Acid is still generally prescribed, but as the dose is large,—20 to 60 minims—and as it is sometimes added to mixtures where the large proportion of water is objectionable, or is already present, the stronger Acid in one-fifth the quantity becomes very convenient.

Phosphorus is pretty generally accepted as an important agent in the treatment of some adynamic conditions of the nervous system, and from time to time it has been insisted on that for its greatest efficiency it must be administered in its unoxidized condition. Several times in the past twenty years it has become the fashion to give phosphorus in substance, either in solution in various forms of tincture,—solution in oil, or distributed in some form of pill mass, or in the form of some easily decomposed phosphides; but the fashion has generally been of short duration, although often well advertised. The reasons why it should not hold its ground in this form are probably the dangerously irritant and toxic nature of the substance,—the certainty that it cannot enter the circulating fluids uncombined,—and finally, the conclusion which seems to have been gradually reached in many quarters, that when oxidized to the condition of phosphoric acid, it is capable of doing all the good attainable from any other condition, while not liable to do harm. The so-called "Chemical Food" and "Acid Phosphates" which have been so abused as to make it difficult to see where the limit of tolerance is, for the human stomach, certainly show that excesses in phosphoric acid are not very hurtful; while the large and still increasing use of it in hospitals for the insane shows its medicinal value. While the dose of uncombined phosphorus is very small, and its administration has to be carefully watched in order to avoid toxic effects, the dose of the acid is large and harmless. One-twentieth of a grain of uncombined phosphorus is a maximum dose which cannot be continued without danger, but when oxidized to the acid condition, one, two or three grains may be given, not only without any danger, but probably with all the advantages that are attainable from the substance in any form. That phosphorus is assimilated and applied to all the needs of the animal organism from phosphoric acid and the phosphates is undoubted, and therefore, it seems highly probable that phosphoric acid is the best, if not the only form in which it should be generally used.

To many persons at least, phosphoric acid is a prompt brain stimulant as well as tonic. When mental activity is depressed from overstrain or deficient nutritive support, one or two fluidrachms of Diluted Phosphoric Acid in the form of a lemonade is not only very refreshing, but is often promptly recuperative, and hours of improved work may be the result. At one time a famous caterer of carbonated drinks in Wall street kept and served a phosphoric acid syrup with his carbonated waters of various kinds, and it was said to be quite popular for its effects upon the overstrained brain work of that locality. But since the death of both the caterer and his immediate successor, the writer does not know whether the practice is continued or not. Probably it was the fashion of a year or two, and may have lapsed, but certainly it had a basis of reality, and was better and more durable in effect than the alcoholic stimuli which for a time it partly replaced. But like alcoholic stimuli, the effect is very different on different individuals.

ACIDUM SALICYLICUM.

SALICYLIC ACID.

$HC_7H_5O_3$; 138.—$HO, C_{14}H_5O_5$; 138.

Fine, white, light, prismatic, needle-shaped crystals, permanent in the air, free from odor of carbolic acid, but sometimes having a slight, aromatic odor, of a sweetish and slightly acid taste and an acid reaction. Soluble in 450 parts of water and in 2.5 parts of alcohol at 15° C. (59° F.); in 14 parts of boiling water; very soluble in boiling alcohol; also soluble in 2 parts of ether, in 2 parts of absolute alcohol, in 3.5 parts of amylic alcohol, and in 80 parts of chloroform. When heated to about 175° C. (347° F.) the crystals melt, and at about 200° C. (392° F.) they begin to sublime; at higher temperature they are volatilized and decomposed with odor of carbolic acid. The aqueous solution is colored intensely violet-red by test-solution of ferric chloride.

A solution of 1 part of Salicylic Acid in 10 parts of alcohol, mixed with a few drops of nitric acid, should not become turbid upon the addition of a few drops of test-solution of nitrate of silver (abs. of hydrochloric acid). A saturated solution in absolute alcohol, when allowed to evaporate spontaneously in an atmosphere free from dust, should leave a perfectly white crystalline residue, without a trace of color at the points of the crystals (abs. of organic impurities, also of iron). On agitating a portion of Salicylic Acid with 15 parts of concentrated sulphuric acid, no color should be imparted to the latter within fifteen minutes (foreign organic matter). If 5 C. c. of saturated aqueous solution of Salicylic Acid be poured into a test-tube, into which had been introduced, shortly before, a crystal of chlorate of potassium and 2 C. c. of hydrochloric acid, and some water of ammonia be now carefully poured on top, the latter should not assume a reddish or brownish tint (abs. of carbolic acid).

This acid is new to the Pharmacopœia, and is a very important addition. The description and tests are very full, and on the whole are satisfactory. It is, however, easily sublimed and at a temperature far below that given. Before the patents were taken out for its manufacture the writer made considerable quantities of it, and found that sublimation was one of the best means for its purification, although Kolbe, who invented the process for its artificial production, had stated that it could not be sublimed. It is sublimed quite as easily as benzoie acid, and in the same kind of apparatus, and is best sublimed by an ordinary steam heat, say 60 to 80 lbs. pressure. And the heat obtainable at such a pressure does not exceed 145° C.=293° F. The sublimed acid is very pure and nice, and has a slight aromatic odor resembling cinnamic acid, but not at all like carbolic acid. Hence the above officinal statements in regard to melting and subliming need correction.

In a "Note on Salicylic Acid," published by Mr. John Williams, F. C. S., of London, in the Pharmaceutical Journal and Transactions for April, 1878, p. 785, the author draws attention to an homologous acid present in the better grades of artificial Salicylic Acid often to the extent of 15 to 25 p.c., and gives a method for separating it. Such a substance, it is believed, is still present in much of the acid of commerce at the present time, though not in so large proportion as when Mr. Williams wrote, and a test for it is very much needed, though not found among the officinal tests. The writer knows of no test for it, nor any better way of avoiding it than by using only the better grades of the well crystallized acid of the market. Even these grades contain 4 to 5 p.c. of something which is not Salicylic Acid, and which is not detected by the officinal tests, but so long as the proportion is so small it is of but little practical importance. It does, however, disturb the chemical reactions of the acid in combining it, as will be further noticed under the soda salt,—whether it affects the therapeutic action or not. It was formerly believed to be the cause of the early gastric disturbance, and of the later delirium, both of which were often very troublesome when the acid was more frequently given uncombined. Latterly, since the acid has improved in quality, and since the soda salt has been so generally used, less has been heard of these troublesome accidents.

The final test of the Pharmacopœia for carbolic acid appears to be hypercritical, since specimens of the acid that were of excellent quality,—even better than is attainable in the ordinary market,—give a pinkish coloration with this test. It is possible that the small proportion of the homologous acid described by Mr. Williams may be decomposed by this test, and thus the reaction be accounted for.

The apyretic effect of Salicylic Acid is one of the most remarkable and important therapeutic discoveries of the age, and its control over all such conditions as are generally met with in acute and subacute rheumatism is almost complete. Its applications, therefore, in medicine are very numerous and very important.

In its internal use the points most necessary to be borne in mind are the disturbing effects of very large doses, and the rapidity with which it is eliminated. It should, therefore, be given in full doses at first until the impression is made, and then in moderate or small doses frequently repeated.

It is best given in wafers or cachets, and it should not be packed into capsules. Two or three doses of 15 to 20 grains with two or three hours' intervals will usually produce its characteristic beneficial effects. Then ten grains every two hours, with intervals gradually increasing to three and four hours, serves to keep up the effects with the smallest risk of such disturbance as will require it to be suspended when most needed.

Of late it has been more rarely used, the Salicylate of Sodium having taken its place with the same effect, and with some advantages.

It is a curious and very interesting and important circumstance that full doses of Salicylic Acid or Salicylates do not interfere with the digestive functions of the stomach, and yet a very small quantity will prevent the action of pepsin. At least this statement is made on what appears to be good authority.

An ordinary cold saturated solution contains somewhere about one part in three hundred, and such a solution is very convenient indeed, as a vehicle for solutions of alkaloids for hypodermic use. If a drachm of the acid be added to a pint of water, and the mixture be well shaken, such a solution with some undissolved acid at the bottom of the bottle will be the result. Then if this be used entire, or diluted with an equal volume of water, for making hypodermic solutions, such solutions will remain free from growths of all kinds for an indefinite length of time, and will not be more irritant than if made from water alone.

ACIDUM SULPHURICUM AROMATICUM.

AROMATIC SULPHURIC ACID.

Sulphuric Acid, *two hundred parts*	200
Tincture of Ginger, *forty-five parts*	45
Oil of Cinnamon, *one part*	1
Alcohol, *a sufficient quantity,*	
To make *one thousand parts*	1000

Add the Sulphuric Acid gradually to *seven hundred* (700) *parts* of Alcohol and allow the mixture to cool. Then add to it the Tincture of Ginger and the Oil of Cinnamon, and afterward enough Alcohol to make the product weigh *one thousand* (1000) *parts.*

Aromatic Sulphuric Acid should be preserved in glass-stoppered bottles.

Aromatic Sulphuric Acid has the sp. gr. 0.955, and contains about 20 per cent. of officinal Sulphuric Acid, partly in form of ethylsulphuric acid.

On diluting 9.8 Gm. of Aromatic Sulphuric Acid with 20 volumes of water, and filtering, the filtrate (with washings) should require, for complete neutralization, not less than 36 C. c. of the volumetric solution of soda.

In the revisions of 1860 and 1870 this preparation was made from powdered Ginger and Cinnamon by exhausting them with a part of the Alcohol, and then mixing this tincture with the remainder of the Alcohol to which the Acid had been previously added. This yielded a preparation in which a deposit soon formed, and the process was thus far objectionable, although the deposit was small and probably unimportant. It was, however, easily avoided, and a better preparation obtained, by mixing nearly all the Alcohol with the Acid, and percolating the spices with the cooled mixture, reserving just enough alcohol to displace the acid mixture from the exhausted spices. A practice of many years with this method leads the writer to believe that it is unobjectionable, while it is both simple and easy.

Now, in the revision of 1880, the spices in substance are replaced by the Tincture of Ginger and the Oil of Cinnamon, or Oil of Cassia, at the choice of the operator. But the Committee of Revision must have determined to alter the proportions greatly, or else some mistakes must have crept in. The 45 parts of Tincture of Ginger represent nine parts of Ginger, but the 1 part of Oil of Cinnamon represents about 100 parts of Cinnamon. The new preparation, therefore, represents 20 p.c. Sulphuric Acid, 0·9 p.c. Ginger and 10 p.c. Cinnamon, while the former preparation of 1870 represents about 19 p c. of Acid,—3.16 p.c. Ginger and 4.74 p.c. Cinnamon. The Ginger element is, therefore, reduced by more than two-thirds, while the Cinnamon element is more than doubled. If it was intended to keep the preparation practically unaltered, as it is in the acid element, then the Tincture of Ginger should have been about 158 parts, representing 31.6 parts of Ginger, and 0·474 part of Oil of Cinnamon, representing about 47.4 parts of Cinnamon, since that spice yields about 1 p.c. or less of oil.

This is not an important preparation, and might have been omitted from the Pharmacopœia without great loss. But as it is now it is not so good as that of 1860 and 1870, and the writer will continue to make by the older formula. In loyalty to the U. S. Pharmacopœia he yields to no one, yet does not feel bound to follow it into its mistakes. The difficulty for him is to ascertain,—or to judge which are mistakes. No authority is free from mistakes, but supposed mistakes are not always really such.

ACIDUM SULPHUROSUM.

SULPHUROUS ACID.

A liquid composed of about 3.5 per cent. of Sulphurous Acid Gas [SO_2 ; 64.—SO_2 ; 32], and about 96.5 per cent. of Water.

Sulphuric Acid, *fourteen parts*	14
Charcoal, in coarse powder, *two parts*	2
Distilled Water, *one hundred parts*	100

Pour the Acid upon the Charcoal previously introduced into a glass flask, and mix the two well together. By means of a glass tube and well-fitting corks, connect the flask with a wash-bottle which is one-third filled with water, and fitted with a cork having three perforations Into one of these perforations insert a safety-tube, which should reach nearly to the bottom of the bottle; into the remaining perforation fit a glass tube and connect it with a bottle which is about three-fourths filled by the Distilled Water. This tube should dip about an inch below the surface of the water. By means of a second tube connect this bottle with another bottle containing a dilute solution of carbonate of sodium, to absorb any gas which may not be retained by the Distilled Water. Having ascertained that all the connections are air-tight, apply a moderate heat to the flask until the evolution of gas has nearly ceased, and during the passage of the gas, keep the bottle containing the Distilled Water at or below 10° C. (50° F.) by surrounding it with cold water or ice.

Finally, pour the Sulphurous Acid into glass-stoppered, dark amber-colored bottles, and keep them in a cool and dark place.

A colorless liquid of the characteristic odor of burning sulphur, a very acid, sulphurous taste, and a strongly acid reaction. Sp. gr. 1.022–1.023. By heat it is completely volatilized. Litmus paper brought in contact with the Acid is at first turned red, and afterward bleached. On pouring a few drops of the Acid into a test-tube containing diluted hydrochloric acid and some test-zinc, a gas is evolved which blackens paper wet with solution of acetate of lead.

If to 10 C. c. of Sulphurous Acid there be added 1 C. c. of diluted hydrochloric acid, followed by 1 C. c. of test solution of chloride of barium, not more than a very slight turbidity should be produced (limit of sulphuric acid).

If 1.28 Gm. of Sulphurous Acid be diluted with 20 volumes of water and a little gelatinized starch be added, at least 14 C. c. of the volumetric solution of iodine should be required, before a permanent blue tint is developed.

This process is practically the same as that of the former revision, and with the present improvements in detail it leaves nothing to be desired. The description and tests are, however, much extended and improved, as they needed to be; but for some unknown reason the Committee has reduced the strength of the preparation nearly one-half. In the previous revisions, for twenty years, the strength has been about 6.4 p.c. while now it is reduced to about 3.5 p.c. This is evidently not a mistake, since the change is duly noted in the Table of changes of strength at page 455; but the writer has never seen any reason given for the change. It is quite as easy to make it of the former officinal strength as the latter, and the precautions necessary to adjust the strength and to keep it unchanged are the same in both strengths. It is an article of extensive use, for a great many different purposes, and hence it goes into a great many channels beyond those of the Pharmacopœia, and in which the Pharmacopœia is not known, and its uses for twenty years past are based upon, and adjusted to, the former strength of 6.4 p.c. Therefore, the present change will disturb a great many, if not all of its prominent uses, and this without any reason that the writer has seen stated. That the Committee had good reasons for the change must, of course, be assumed, but neither the writer nor any persons whom he has asked,—some members of the Committee included,—at present know why the change was made. Thus in the absence of known reasons, manufacturers who have a steady demand for the article are not likely to make the change in their product, but if they do not, or if they do, even, they should certainly give their strength upon their labels. And if they adhere to the former strength the label should not only state the strength but give a formula for reducing it from the former officinal strength to the present. The relations of the strength are such that no exact formula can be given. Each part of the 6.4 p.c. requires 0·828591+part of water to be added to reduce it to 3.5 p.c. But a more practical relation or formula is that 1 pound avoirdupois of the 6.4 p.c. strength requires 13¼+avoirdupois ounces of water to reduce it to 3.5 p.c., or practically 13 ounces. This makes the practical relation of 16 acid to 13 water, as the lowest expression without fractions. Therefore the physician or pharmacist who buys a one-pound bottle of the 6.4. p.c. and wants to reduce it to the present officinal strength, must transfer it to a tared bottle of sufficient size and add to it 13 avoirdupois ounces of water.

As it can be made of the former strength very nearly as easily and as cheaply as of the present, the price of the lower strength will not be proportionately less, and should not be, under any circumstances, more than 25 p.c. less,—it will be to the interest of all dispensers and consumers to buy the 6.4 p.c. and reduce it, because by this, not only in price per pound, but in bottles, freight, risk, etc., for the carrying and storing of the 13 ounces of water, there is a very considerable saving, and the requirements of the Pharmacopœia can be as fully met as though it was bought of the officinal strength, while the other numerous and large uses of the acid, which are now so long established on the former strength, will not be disturbed.

For the destruction of all the lower orders of animal and vegetable life there are few agents so simple and effective as Sulphurous Acid, and hence it is one of the best and cheapest antiseptics and disinfectants, and one which is adapted to a great many uses. Being a gas, and one that is given off freely and rapidly from all its solutions and from burning sulphur, it is capable of being made to penetrate into all air spaces wherever germs and foul gases can go. It is, therefore, an excellent deodorizer as well as a disinfectant, and one of easy application, but must always be used in sufficient quantity to be effective, and when in sufficient quantity,—like chlorine gas,—it renders the air irrespirable.

It must not be forgotton that in its action it is converted into sulphuric acid by oxidation, and that this acid is corrosive and destructive; and also that sulphurous acid is a powerful bleaching agent and often destroys the colors of fabrics, wall-papers, frescoes, etc.

In the treatment of all diseases of parasitic origin it is unfailing if applied properly and of sufficient strength.

END OF VOLUME I.

INDEX.

A

M

N

O