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LABORATORY NOTES ON THE DETERMINATION OF QUININE IN THE PRESENCE OF CERTAIN OTHER SUBSTANCES, AND ESPECIALLY IN "FERRI ET QUINIÆ CITRAS.*

BY ALFRED NEOBARD PALMER.

The chemist is often required to determine the quinine in pharmaceutical preparations wherein the alkaloid is associated with other substances—such as glycerin, sugar, citrate of ammonium, etc.—and it then becomes important for him to know whether the presence of the substances just named at all interferes with the accuracy of his determination of the quinine when that determination is effected by shaking up the fluid with ether or chloroform after the quinine has been precipitated with an alkali. Moreover, still following this method of analysis, it sometimes becomes necessary, in the case of certain cinchona preparations, to add considerable excess of the alkali, so as either to re-dissolve some of the substances other than quinine precipitated together with the latter, or to render the line of separation between the aqueous layer and the chloroformic or ethereal layer quite clear and well-defined. And here, again, the analyst desires to know whether, in the presence of this possibly large excess of alkali, he still gets in his chloroformic or ethereal layer all the quinine that exists in the fluid operated upon. I have at various times made experiments with a view of satisfying myself upon some of these points, and since the appearance of Mr. Allen's interesting paper† have continued these as well as made two or three additional ones on the determination of quinine with *chloroform* in presence of sugar, Mr. Allen having confined himself to its determination

*From the Pharmaceutical Journal and Transactions.
†Pharmaceutical Journal, June 3rd, 1876, p. 964.

under these conditions with *ether*. The result of these experiments I now present.

In all cases where the simple and rapid method of estimation above referred to can be employed I am now accustomed to use a pear shaped glass separating vessel, which may be obtained of apparatus dealers, of about four ounces capacity, the pear stalk being represented by a short tube provided with a tight-fitting stopper, while at the opposite end of the vessel, representing the top of the pear core, is another stoppered opening. Through this last opening fluids are poured into the separating vessel: by the tube they are run out of it. I will now describe distinctly my course of procedure in these experiments. Let us suppose we have a solution of sulphate of quinine, and we make two estimations of it—one by ether and one by chloroform. The tube-cock of the separating vessel being closed, a measured volume of the solution to be examined was run in; then (out of a burette) the alkali; lastly, ether or chloroform was poured in, the whole well shaken, and set aside for at least two or three hours. When ether was used the underlying watery layer was drawn off down to the stop-cock; then a little water poured into the glass vessel, the stopper, (which was of course removed while the watery layer was being drawn off) inserted; the whole well shaken and set aside for another two or three hours. The watery layer was now drawn off to the last drop down to the very bottom of the tube, and the ethereal layer run off through a small filter into a weighed dish; a little more ether was shaken up in the vessel and run into the dish in the same way: the ether in the latter evaporated, and the residue dried at about 270°F.,* and weighed. When chloroform was used, after the underlying layer was drawn off down to the tube-cock through a small filter into the dish below more chloroform was poured into the vessel, well shaken up, and after two hours drawn off down to the last drop through the filter, and evaporated with the first layer.

When the substances, whose effect on the accuracy of the quinine-determination was to be studied were present, these were added in solution to the sulphate of quinine solution and thoroughly mixed therewith previous to the addition of the alkali.

I have entered into these details so that my method of procedure and allusions hereafter may be clearly apprehended.

I may say further that in all my experiments specially prepared and quite pure sulphate of quinine and well washed ether and chloroform were alone employed.

I find then that, working under these conditions—

*The residue of quinine left on evaporating an ethereal or chlorofomic solution of quinine on the water-bath does not contain a constant percentage of water. I cannot agree with Mr. Allen when he implies that the "ether residue" is always hydrated to the extent of 4.28 per cent. Constant results can only be obtained by weighing the residue after drying at 260°—270°F.

1. Whether the precipitant be ammonia, potash, or soda, whether added in slight or in large excess, whether the quinine solvent be ether or chloroform is quite indifferent. In any case, and in all cases the actual quantity of quinine present in the fluid operated upon is obtained.

2. The association of sugar or of glycerine with the quinine in the fluid nnder examination does not in any way affect the accuracy of the process when the precipitated quinine is dissolved by shaking up the mixture with *chloroform*, and drying the residue of evaporation of the latter at 260°–270° *until its weight is constant*, Mr. Allen has shown that ether also in the presence of sugar takes up all the quinine thrown down by an alkali. I believe this is also the case in the presence of glycerine. In one experiment undertaken with a view to satisfy myself hereon I recovered all the quinine present but in a second only ·1 grm. out of ·106 grm. It is possible, however, that in the latter case a little of the ether was spilled. I have had neither time nor inducement to proceed any further with the investigation of this particular point.

3. Nor does any loss of quinine occur when it is determined in presence of citrate of ammonium, so long as chloroform is the solvent employed.

4. But when in the last case ether is substituted for chloroform, the ethereal layer contains only a portion of the quinine present, the remainder being held entangled in the aqueous layer, from which it can be extracted by shaking the latter with chloroform, and this is still so even when the aqueous and watery layers are allowed to remain in contact for so long a time as eighteen hours. I may say that in such cases the aqueous layer, which tastes very bitter, has always a strongly ethereal smell; and from this fact as well as from other circumstances, I am inclined to think that the ethereal solution is rather mechanically entangled in the aqueous layer than that the quinine is chemically retained by it. But, however to be explained, about the fact of the retention of part of the quinine under these circumstances by the solution of citrate of ammonium, there can be no doubt at all. In one experiment 6·5 per cent. of the quinine was thus retained; in a second experiment 12·1 per cent.; in a third, 13·8; in a fourth, 37.5 per cent.; in a fifth, 50 per cent. It seemed to me that the percentage retained varied with the *strength* of the citrate of ammonium solution as distinguished from the *volume* of the latter. But I am not sure of this.

"Ferri et Quiniæ Citras" is sometimes estimated by shaking a solution of the substance with ether after addition of excess of ammonia, and weighing the residue obtained on evaporating the ethereal layer. But "Ferri et Quiniæ Citras," contains citrate of ammonium, and ether (as the results described above show) is incompetent (or at least cannot be relied on) to remove all the quinine which is precipitated in a solution of that salt. We are not there-

fore surprised to find "Ferri et Quiniæ Citras." when estimated by this process, showing very low percentages of quinine. If the alkalized aqueous layer which has been shaken with ether be tasted it will nearly always be found very bitter, and, if shaken up with chloroform, will yield to the latter an additional quantity of quinine. In three cases recorded in my note-book chloroform extracted an additional 2 per cent. or thereabouts of quinine, in each case the ethereal and aqueous layers having been allowed to remain in contact for several hours before the underlying layer was drawn off.

The same experimental results, however, that condemn beforehand the use of *ether* for the determination of quinine in "Ferri et Quiniæ Citras" indicate at the same time the employment of *chloroform* for that purpose. When a watery solution of from 8 to 12 grains of the sample, contained in the "pear-shaped evaporating vessel," is *strongly* alkalized with ammonia, twice shaken with chloroform, and treated in the way described above, the whole of the quinine contained in the citrate will be found in the two chloroformic layers. The process, thus carried out, for accuracy, simplicity, and rapidity, leave nothing to be desired. After the precipitated quinine has been shaken up in the separating vessel with chloroform, the latter need not remain longer than half an hour before being drawn off. The addition of the ammonia to *strong* rather than *faint* alkalinity is rendered necessary by a fact to be referred to presently, while this excess, as we already know, in no way affects the accuracy of the determination. Of course, if a preliminary experiment should show that only a portion of the alkaloid precipitated from the citrate, on addition of ammonia, is dissolved when shaken with a suitable quantity of ether, the total alkaloid obtained by this method will have to be dissolved in dilute acid, and the amount of quinine therein determined by any of the approved processes. Citrate of ammonium being absent from this solution, ether may now be relied on for taking up all the quinine precipitated in it, and unless employed in too great excess, for separating this from the other cinchona alkaloids present.

Samples of "Ferri et Quiniæ Citras," yielding by the chloroform method of analysis just described 13 per cent. of pure waterless quinine, will answer to the pharmacopœia tests; but the citrates sold as "P.B." of the best makers seldom contains less than 14 per cent. And when the substance referred to is made according to the process of manufacture recommended in the pharmacopœia, I do not think a much higher percentage of quinine than this will in general be obtained. Four samples of different makers (all of them of high repute and standing) gave, by the chloroform method, 14, 14·2, 14·4 and 15·37 per cent. respectively of the pure dry alkaloid.

When by addition (from a burette) of a dilute solution of ammonia to an aqueous solution of "Ferri et Quiniæ Citras," the latter has become distinctly alkaline to red litmus paper, further

addition of ammonia gives a further precipitate of quinine, and this will continue until at last often more than twice the volume of ammoniacal solution has been added that was added at first. In one case further addition of ammonia to ferro-quinic citrate solution, after the latter already turned red litmus paper dipped into it distinctly blue, precipitated an additional 4·6 per cent., and in another case an additional 3 per cent. of quinine.

The method of estimating "Ferri et Quiniæ Citras" recommended in the pharmacopœia cannot be said to be at all satisfactory. If the indications of litmus paper be alone attended to, the "slight excess of ammonia" there prescribed may be, as we have seen, *too slight* to precipitate all the quinine present. We are not told, moreover, whether the precipitate so obtained when collected on the filter is to be washed or not: if washed, some of the quinine will be dissolved out by the wash-water; but, if unwashed, it will retain a very great deal of the solution in which it is precipitated, the ammonium and iron citrates of which will then be reckoned as quinine. In one experiment, the unwashed precipitate obtained from 50 grains of a sample of "Ferri et Quiniæ Citras" containing 13 per cent. quinine having been collected on a small filter, and allowed to drain in the funnel for forty-eight hours, was found, after drying, to weigh 8·2 grains; the filtrate (somewhat short of a fluid ounce in volume) yielding to chloroform an additional ·4 grain of quinine. Now as only 6·5 grains of quinine were present together, and of this ·4 grain was contained in the filtrate, there could have been upon the filter no more than 6·1 grains: 8·2 grains were however indicated, which quantity therefore consisted of 2·1 grains of citrate of iron and ammonium and 6·1 grains of quinine. At another time in the case of a sample containing 14·4 per cent. quinine, when the filter, with the precipitate from 50 grains upon it, instead of being drained in the funnel, was placed upon several folds of blotting paper to remove superfluous moisture, the precipitate was found to weigh 9·5 grains. But since the filtrate contained dissolved ·3 grain of quinine, there could not have been upon the filter more than 6·9 grains of the alkaloid, which were therefore here associated with 2.6 grains of foreign substances. Results more nearly approaching accuracy may be obtained by pressing the precipitate repeatedly between folds of blotting paper, and still more nearly by transferring it to a weighed capsule which is then slightly warmed: the quinine will immediately shrink upon itself and set free the greater part (about three-fourths) of the retained solution of the citrates, which may be easily poured off, the residual quinine being then dried and weighed. But our precipitate will not now amount to the 8 grains which the pharmacopœia requires. And it it will still fail to represent the quantity of quinine actually present in 50 grains of the sample, since, on the one hand, it will retain even now about ½ grain or ¾ grain of iron and ammonium citrates, and will be deficient, on

the other, in respect of the quinine dissolved in the filtrate and lost in other ways. It is true that these two opposite sources of error will sometimes balance each other. But we may well be impatient of a process giving results that are only approximately accurate, when in that by chloroform we have one which is as absolutely trustworthy as it is simple in application and rapid in execution.

THE TREATMENT OF BURNS.*

It is always useful to have at one's fingers ends the best treatment for such common and painful emergencies as burns and scalds, and, indeed, such knowledge cannot be too widely diffused. The summary given by Mr. Holmes, in his recent Manual of Surgery, is very concise and complete, and embodies large experience. He says:—

At the time of the accident, the main indications are to exclude the air from the burned surface, to allay pain by opiates, and to give stimulants in such quantities as may be necessary. The applications which are in use for burns are too numerous to mention, and the choice of one or other of them will depend in a great measure to the depth of the burn. A mere superficial scorch is best treated by some warm solution applied on a thick rag and kept constantly moist. Goulard-water with laudanum is perhaps as grateful as anything. Painting the surface with ink soon relieves the pain of a small superficial burn, or covering it with whitewash or some other similar substance, which will crust over it and completely exclude the air from it. Common flour thickly dredged on the part is a very good and handy application. But such crusts should not be applied over burned surfaces of the second degree, since their removal would soon become necessary, and this would drag off the epidermis. The bullæ should be pricked, the epidermis gently smoothed down, and some simple ointment put next the skin, or some oily substance which will not stick when it is necessary to change it. A very favourite application to these burns and to others of greater depth is the carron oil, made by mixing lime-water and linseed-oil in equal parts, and deriving its name from its having come into extensive use at the great Carron Foundry in the numerous burns occuring there. Oil of turpentine is a very good application to those in which the surface of the skin is quite destroyed. But for the first few days I doubt whether anything is better than simply swathing the part in thick layers of cotton-wool, which is prevented from sticking to the burned surface by some simple ointment (cerat. calaminæ is generally used) spread on thin soft linen or

*Phila. Med. & Surg. Rep.

cambric, and covering the whole burned surface. When after a few days, the discharge becomes foul, this dressing should be changed for some deodorizing or antiseptic oily application, or the latter may be used from the first; but all the antiseptics I have yet seen used have been stimulating, and for the first few days it is desirable, I think, to avoid any local stimulation. The carbolized oil answers every indication better than any other substance which I know of, but it should not be used too strong; for it may both prove too stimulating and thus increase the discharge, and it may be absorbed, producing a black condition of the urine, and other symptoms of incipient poisoning. It is well, then, to begin with a very weak solution (about 1 to 12), and if this does not correct the fetor its strength may be gradually increased, or a stronger solution of carbolic acid may be placed over the dressings. If carbolic acid is not tolerated, some preparation of benzoin, or Condy's solution, or the lot. sodæ chlorinatæ may be applied either directly to the burned surface or over the dressings.

THE SOLUBILITY OF CINCHONA PRINCIPLES IN GLYCERINE.*

BY F. ANDREWS, LONDON.

A notice of the solvent powers of glycerine upon Peruvian bark having lately appeared in the *Pharmaceutical Journal* and *The Chemist and Druggist*, an account of a few observations made by myself, although very fragmentary and incomplete, may perhaps prove interesting.

Some months ago I had occasion frequently to mix tincture of bark with glycerine in equal proportions. As the mixture remained perfectly bright it occurred to me that perhaps glycerine might prove as good a solvent of the active principles of cinchona as the spirit, and I therefore made the following experiment:—Four ozs. of yellow bark in coarse powder were mixed with four fl. ozs. of rectified spirit, and digested for several days. The mixture was transferred to a percolater and spirit added until four ozs. of a very strong tincture of bark had passed through. This was mixed with an equal quantity by measure of glycerine, and the spirit evaporated. There remained four fluid ozs. of a thick syrupy liquid, dark brown in colour, and having the peculiar bitter and astringent taste of Peruvian bark in the highest degree: it was perfectly bright, and entirely without deposit, showing clearly that the glycerine had retained all that had been dissolved by the spirit. I then thought it would prove im-

*Abstract of a paper read at the British Pharmaceutical Conference, and published in the Chemist & Druggist.

portant to find whether there was anything left in the bark that could be extracted by glycerine, and, therefore poured water into the percolator until upwards of eight pints had passed through, and the percolated liquid was colourless and tastless. The apparently exhausted bark was then placed in an evaporating dish, and four fl. ozs. of glycerine stirred in. The mixture was heated slightly, and allowed to stand a day or two, again transferred to the percolator, and water passed through until about a pint of turbid brownish liquid was obtained. This was evaporated to four fl. ozs., the result being a dark brown syrupy fluid, having, of course, the peculiar taste of glycerine, but with very slight bitterness or astringency.

Several experiments were then made by the direct action of glycerine upon bark. Percolation was tried, but the process was so slow as to be practically useless, and finding that quinia and its sulphate were soluable in warm glycerine, and were not precipitated from solution by the addition of water, the following was adopted as the best :—

Four ozs. of yellow bark were mixed with eight fluid ozs. of glycerine, heated for a short time over a water bath, and allowed to stand till cold : water was then added in successive portions, and strained out, until there appeared no extractive left. The whole was then evaporated to eight fluid ozs. the original bulk of the glycerine. This liquid carefully made, appears to contain in each fluid ounce the whole extractive matter of half an ounce of bark, and might, I think, be appropriately termed glycerinum cinchonæ. Of its medical value it is not for me to offer an opinion, but two or three medical men to whom it has been mentioned think it likely to be very useful.

In conclusion, I must apologise for a very imperfect essay. I had intended to do much more, but have been prevented. However, the solubility of quinine in warm glycerine, and the extraordinary power possessed by the latter of dissolving the extractive principles of cinchona, are, I hope, facts of sufficient pharmaceutical importance to justify my little paper. I hope now some one more able will take up the subject, but shall try to return to it myself, and report progress at our next meeting.

Professor Redwood regarded this as a useful and practical paper.

Mr. Cleaver asked if the glycerine extract gave any precipitate when mixed with water.

Mr. Martindale referred to the formula in the United States Pharmacopœia, which he said somewhat resembled this preparation. The strength of that was 16 fluid ounces, equal to 1 lb of the bark. He had found that product liable to gelatinise. It mixed tolerably well with water.

Mr. Ekin asked what particular bark had been used. He supposed the gelatinisation referred to by Mr. Martindale would be due to quinovic acid.

Mr. Andrews said the preparation did precipitate when mixed

with water, but to a very slight extent, not nearly so much as the Pharmacopœia liquid extract. The bark he had used was fully up to the Pharmacopœia standard. After extraction by glycerine there was a trace of bitterness left in the bark, but it was very slight.

ALCOHOLIC SOLUTION OF SHELLAC.*

BY A. PELTZ.

The production of a clear alcoholic solution of shellac has been the subject of numerous experiments, but hitherto none has turned out satisfactory except slow filtration. As is known, by digestion of one part of shellac with six or seven parts of 70 per cent. alcohol, a solution is obtained which when warm is almost clear, but upon cooling becomes turbid and is only partially clear after standing a week. The plan of pouring sufficient alcohol over coarsely powdered shellac to form a thin paste, yields upon the addition of more alcohol after the lapse of eight or ten hours a liquor that does not deposit any more, but which is not clear. Another method suggested, of boiling the alcoholic shellac solution with animal charcoal gives a clearer liquid, but there is always loss through absorbtion by the animal charcoal.

The object sought by the author was to obtain a clear alcoholic solution in a short time without much loss. Previous communications upon the substance occurring in shellac to the extent of five per cent., which renders its alcoholic solutions turbid, and is described by some authors as wax and by others as a fat acid, suggested an attempt to effect its removal before dissolving the shellac. The shellac therefore was boiled with water, from one to five per cent. of soda or ammonia being added, but without satisfactory result, a somewhat larger addition of the alkali caused the solution of the shellac.

The author next prepared a solution with one part of shellac and six parts of 90 per cent. alcohol at the ordinary temperature, which was effected with frequent shaking in ten or twelve hours. To this he added carbonate of magnesia to about half the weight of the shellac used and heated the mixture at 60° C. The solution so obtained cleared more rapidly than a solution to which magnesia had not been added and filtered in less time; but it did not supply what was sought. When powdered chalk was substituted for magnesia, the solution after standing some hours became three-fourths clear, while the lower turbid portion could be rapidly filtered. It only required a little alcohol to wash the filter, and a clear alcoholic

*Pharmaceutische Zeitschrift f. Russland, in Pharm. Jour. & Trans.

solution of shellac was obtained. Further experiments, for instance, with sulphate of baryta, did not give a better result. When such a solution is made on a large scale it would be best filtered through felt.

Notwithstanding that the object of the author had thus been attained, one or two other experiments were tried. To three parts of the above-mentioned shellac solution one part of petroleum ether was added, and the mixture was vigorously shaken. After standing a few moments the liquid separated in two layers; the upper light coloured layer was the petroleum ether with the wax dissolved in it, the lower yellow brown layer was a clear solution of shellac with only a little petroleum ether adhering. Upon allowing the petroleum ether to evaporate spontaneously, the wax that had been dissolved out of the shellac was obtained as a white residue. By using a stronger alcohol (95 per cent.) to dissolve the shellac, and subsequently adding petroleum ether a perfectly clear solution was obtained that only separated into two layers after the addition of water. Consequently an alcohol weaker rather than stronger than 90 per cent should be used.

The shellac solution obtained by means of petroleum ether, however, has the disadvantage that the shellac is left after the evaporation of the petroleum in a somewhat coarser form and easily separates; this may be obviated by the addition of one to three per cent. of Venice turpentine.

Further experiments showed that the petroleum ether could be replaced by the ordinary commercial benzine.

ADULTERATION OF ESSENTIAL OILS.*

Before proceeding into details, we wish to call special attention to the outrageous frauds which are constantly practised in the sale of essential oils. Many of these are daily huckstered about among the dealers and consumers in the larger cities by a class of itinerant vendors who have their stock in trade with them, and who dispose of their wares for almost any offer that they can obtain. Their oils are usually largely and clumsily adulterated, though it is not always possible to prove the admixture by positive chemical tests. One of these New Jersey distillers frankly admitted to the writer that all the commercial oils of cedar, hemlock, and spruce, made by him and his acquaintances, are prepared by putting the branches of the respective trees into the still with an amount of turpentine proportioned to the price they expected to realize. He prided himself not

* From the Report on Adulterations published in the Proceedings of the American Pharmaceutical Association.

a little on the superiority of these *distilled* oils over those made by mere admixture with turpentine.

When it is borne in mind that by far the major portion of the more expensive oils are consumed by bakers, confectioners, soap-makers, and bottlers of mineral or soda water, who have no means for testing them, and who thus become easy victims to these vile swindlers, we are more forcibly than ever before impressed with the desirability of perfecting some plan for the better protection of honest merchants and for the punishment of the guilty. The writer has on two occasions purchased four cans of oil of lemon, one lot of which contained but 75 per cent. of oil, and the other scarcely 33 per cent. Had these been accepted, the loss in the one case would have been about $75, in the other over $175. We may well compare this species of fraud to that of passing counterfeit money, and it seems but just that similar punishments should be inflicted for both crimes. Nor are substitutions of this kind by any means confined to our illustrious New Jersey friends. It would almost seem as though European distillers were trying to rival, if not to surpass them. The writer recently had in his employ a gentleman who claimed to have formerly held responsible positions in two of the largest German houses dealing almost exclusively in essential oils. He exhibited to us a full line of receipts for mixing and cheapening all the more prominent oils, on which he placed great value, and which he was very anxious to compound in this country. Still more recently, the writer was informed by the official representative of an extensive French firm, of Grasse, that all the chief grades of lavender, rosemary, and origanum or red thyme, sent to this country, both by themselves and other manufacturers, contained at least 75 per cent. of turpentine. And yet some druggists can rarely find essential oils quite cheap enough to suit their views!

Oil of Almonds.—We are informed on most excellent authority that the so-called *French* oils of almond, both fixed and essential are obtained exclusively from peach kernels.

Oil of Bergamot.—We were shown a highly complex formula said to be used by the manipulators in Germany for skilfully reducing this oil. Almost three-fourths of the compound consisted of the oils of orange, copaiba, lemon, a little neroli, and several others. We were informed that large quantities of this sophisticated oil are disposed of in Europe.

Oil of Ceylon Cinnamon.—Albert P. Brown found this oil to be adulterated with sassafras and cloves. The oil of the leaves of the Ceylon cinnamon is also frequently sold in place of the true oil of the bark. The former is a brown, viscid, essential oil of clove-like odour; it is sometimes called Heavy Oil of Ceylon Cinnamon.

Oil of Erigeron.—A specimen of this oil was sent to the writer by Mr. Joseph L. Lemberger, which was so largely adulterated that the true odour was entirely overpowered by that of turpentine.

OIL OF JUNIPER BERRIES was offered to the writer by a highly respectable firm of wholesale liquor dealers, who, in their desire to have a really pure and superior article, had themselves imported it direct from Holland, having ordered the very best that was obtainable. As a very much greater quantity had been sent than their order called for, they were anxious to dispose of a portion of it. The gentlemen were so very sure about the absolute purity of their oil, for which they had paid a very liberal price, that they were loath to believe their own eyes, when, after agitation with an equal quantity of water, only 20 per cent. of their so-called oil was left, the remainder being alcohol.

OIL OF LEMON, put up in original cans and genuine imported cases, branded "E. B. & Co.," was found by the writer to contain 25 per cent. alcohol and 40 per cent. castor oil. Another lot, branded "W. S. & Co.," contained 25 per cent. alcohol. There is every probability that both seals were counterfeit, as the letters composing them were slightly different from those found on the top of genuine cans from Brehmer & Sanderson. The metal on which the seals had been impressed also presented a dull and tarnished appearance, while it is usually perfectly bright and clean.

OIL OF MELISSA.—The oil of lemon-grass, obtained in the East from *Andropogon citratus*, is very frequently substituted for the true oil of melissa, which is distilled in Germany from *Melissa officinalis*.

OIL OF ORIGANUM rarely reaches this country. A few pounds imported by the writer cost about $5 per pound. The so-called commercial oil of origanum is obtained in France from *Thymus vulgaris*. The original packages are even distinctly marked *Essence de thym rouge*. As has been already stated, this oil is very frequently mixed with turpentine in large proportion. Its chief consumption is among the manufacturers of patent liniments, who are totally indifferent as to quality, so they only obtain an original package.

OIL OF PEPPERMINT was met with also largely reduced with castor oil and alcohol. Twenty-six pounds of this adulterated oil yielded, when distilled by the writer, 8½ pounds of pure oil, about a gallon of castor oil remaining in the still. The proportion of alcohol, which had been present, is represented in the loss.

OIL OF ROSE GERANIUM is now so frequently substituted by the ginger-grass or palma rosa oil, obtained from *Andropogon Schœnanthus*, that it is somewhat difficult to procure the true oil of *Pelargonium odoratissimum* or *Radula* in commerce.

OIL OF SASSAFRAS was purchased by the writer from a party who represented that he had personally distilled it, and was found on evaporation to leave a residue of 14 per cent. of rosin.

OIL OF VERBENA is almost out of the market, being everywhere substituted by the oil of lemon-grass, *Andropogon citratus*.

OIL OF WINTERGREEN was offered to the writer by a tall Jerseyman, who professed to have distilled every drop of it himself, and

who therefore claimed to be able to guarantee its absolute purity, which proved to contain just two-thirds of its volume of alcohol. It is somewhat remarkable that even this large proportion of alcohol could scarcely be recognized by the senses, and that, as far as could be judged by the taste and smell, this was an unusually fine specimen of oil of wintergreen. Several other lots have been met with containing various proportions of oil of sassafras.

Oil of Wormseed.—Joseph L. Lemberger has favoured us with a specimen of this oil, smelling very strongly of rancid turpentine.

Oil of Wormwood has been met with extensively mixed with turpentine.

Olive Oil is largely substituted by some of the cheaper fixed oils found in this market. Very little of that which is sold by grocers is even imported from Europe. A new York merchant, who is extensively engaged in bottling this article in imitation of the imported style, informed us that for the cheapest grade he is in the habit of putting up refined cotton-seed oil, and for a somewhat better brand the oil of benne. The expressed oil of mustard, a by-product in the manufacture of table mustard, is also applied to the same purpose. Our French friend, whom we have before alluded to, also kindly informed us that in his country the ground-nut oil (*Arachis hypogœa*) is used to an enormous extent for admixture with olive oil, so that but very little of the latter is exported strictly pure.

FENUGREEK.*

BY J. R. JACKSON, A.L.S.

Trigonella, the genus to which the fenugreek belongs, is a group of herbaceous plants belonging to the Papilionaceæ, natural order Leguminosæ, rather widely distributed in Southern Europe, Northern, Central, and Southern Africa, Western and Central Asia, and one species (*T. suavissima*) in Australia. All the plants possess a strong, clinging, aromatic odour, which is particularly the case with *T. Fœnumgrœcum*, the most important plant in the genus. It is a native of the region of the Mediterranean, where it has been cultivated for a very long time, and is an erect annual from one to two feet high, with obovate cuneate leaflets and yellow papilionaceous flowers borne in the axils of the leaves. The pods are from two to four inches long, pointed or beaked, and contain from ten to twenty small, rough, brown seeds.

The fenugreek claims a history of great antiquity; the plant

*From the *Gardeners' Chronicle*, in the *Pharm. Jour. & Trans.*

was much valued by the ancients both for food and medicine, and it was also grown for the purpose of feeding oxen. It is referred to by Hippocrates, and was prescribed by Aretæus both for internal and external application. Reduced to a powder, the seeds were recommended by Dioscorides to form cataplasms in inflammatory cases. Pliny refers very fully to its medicinal virtues, and other authors, especially Avicenna, treat of its properties at some length. Pomet, in his 'Compleat History of Druggs,' published in London in 1725, says, "The ancients and some Germans at this time make a decoction of this seed, and eat is as they do other pulse, to remove and expel wind; but I believe few or none will imitate them in this practice, which is so disagreeable to the nose and palate; it is much better for cattle, and especially horses, to mix with their oats to fatten them. It is of greater use externally than internally." These seeds continued to be used for external application, chiefly for cataplasms and fomentations, down to a comparatively recent period, but at the present time their chief uses with us are in veterinary practice, and as a condiment in curry powder. It is not many years since, however, that they were included in the Greek Pharmacopœia. Pomet's opinion that these seeds are "much better for cattle, and especially horses, to mix with their oats to fatten them," seems to have become fully realized, for at one time the powdered seeds of fenugreek were greatly in demand for feeding cattle, and it is said that the patent cattle foods so much advertized at the present time are largely composed of, or seasoned with, these seeds. Be this as it may, it is certain that, when crushed, they are much used for flavouring damaged hay.

Pomet, in the work before referred to, gives a quaint but tolerably accurate description of the plant, as well as a figure. He says:—"Fenugreek, which some call improperly Senegrè and others Bucera or Aigoceros, because the pods which enclose the seed resemble in some manner a goat's horn, is a plant which grows in several parts of France. Its stalks are round, hollow, of a darkish colour, the leaves small, half-round, composed of three and three together, something after the nature of the trefoil, the flowers small and white, bearing a large pod, which is long and sharp, representing, as said before, a bull's, or rather, a wild goat's horn. The seed carries the name of the plant, and is the only part of it which is sold by the name of fenugreek. This seed ought to be fresh, of a lively yellow, towards a gold colour, but it becomes reddish, and changes brown if long kept; it is about half as big as a grain of wheat, hard and solid, and is of a triangular shape, but the smell and taste of it are both offensive. The farmers about Aubervilliers sow and cultivate this as they do coriander seed, which is sent to Paris, and from thence to Holland and other parts."

Woodville in his 'Medical Botany' refers to the plant as a native of Montpellier, and as having been first cultivated in Britain

by Gerard. Southern France and Germany furnished this country with its supplies of fenugreek seeds at the time Woodville wrote, the plants being cultivated expressly for the seeds, which were largely exported. That these formed an article of import long prior to the date of the above work—1793—or even to that of Pomet, is clear, for in a curious little book called 'The Treasury of Drugs Unlocked,' by Jo. Jacob Beehe, of London, merchant in drugs, published in London, in 1690, we find in a simple alphabetical list of useful seeds and the places of their production, the following:—"Semen Fænugreci, Germany." The plant is now cultivated largely in India, also in Morocco, the South of France, some parts of Germany and Switzerland, as well as in other warm climates. In Alexandria the seeds are eaten as an article of food prepared in the following manner: They are put into cups, and kept wet to cause germination. In a few days the cups are filled with growing plants, in which state they are sold in the streets, and appear to be relished as a great delicacy. In India the fresh plants are eaten as a green vegetable, but the seeds are by far the most important product, as is proved by some statistics quoted by Dr. Fluckiger and Mr. Hanbury in their new work on drugs, wich show that the quantity of seeds imported from Sind to Bombay during the year 1872-73 amounted to 13,646 cwt., the value of which was £4405. From Bombay also were shipped in the same year 9655 cwt., of which quantity only 100 cwt. were sent to the United Kingdom.

CARBOLIC ACID POISONING.

Dr. W. H. Griffith says on this subject, in the *Medical Press and Circular*:—

"Many cases have been recorded of poisoning by carbolic acid, arising both from its internal use and from the external application of it to a raw surface. It gives rise to giddiness, nausea, a feeble pulse, delirium, coma, or collapse, and sometimes to severe spasms, ending in paralysis and death. The post-mortem examination reveals a liquid state of the blood, and a pale and shrunken condition of the lungs. There is intense venous congestion of the brain and its membranes; and in Neumann's experiments on the lower animals he found that carbolic acid caused congestion of the brain substance and fatty or granular degeneration of the liver in the lower animals.

"Olive oil is stated to be the best antidote, but the combination formed by oils with carbolic acid tends rather to facilitate the absorption of the latter. The administration of albumen, which forms with the acid an inert coagulum, is unquestionably a better measure. Husemann considers that saccharate of lime acts more efficaciously, an opinion with which I am inclined to coincide.

"Most authorities state that the treatment of a case of poisoning by carbolic acid should consist, first, of the immediate administration of emetics; but as the alimentary tract is rendered insensible by the local action of the poison, emetics are entirely inoperative and utterly useless. Without doubt, however, the stomach-pump should be used without delay, and plenty of milk and the reputed antidotes should be administered,

"Carbolic acid is largely used to prevent stenches. When offensive gases are once formed they are not destroyed by carbolic acid, as they are by chlorine or by permanganate of potash; carbolic acid can only prevent their generation.

"The fact of venous congestion of the brain having been observed as a consequence of carbolic acid poisoning has led to the adoption, by Dr. Moslen, of Griefswald, of venesection of the external jugular, with a successful result.—*Phila. Med. & Surg. Rep.*

COMPARATIVE VALUE OF VARIOUS FUELS.

Although frequent attempts have been made to render the use of fuel as advantageous as possible, the results are far from satisfactory, as only part of the heating power is utilised. The difference between theoretical and effective heating power for various sorts of fuel may be seen by the following table, which gives the number of pounds of water evaporated by one pound of fuel.

Fuel.	Heating Power.		
	Theoretical.	In Steam Boilers.	In Open Boilers
Petroleum	16·30	10—14	.....
Anthracite	12·46	.....	.....
Coal	11.51	5·2—8	5·2
Charcoal	10·77	6—6·75	3·7
Coke	9–10·8	5—8	.....
Brown Coal	7–·7	2·2—5·5	1·5—2·3
Peat	5·5–7·4	2·5—5	1·7—2·3
Wood	4·3–5·6	2·5—3·75	1·85—2·1
Straw	3·0	1·86—1·92	.....

As regards the heating of steam boilers, Mr. Thompson found, by a series of experiments, that on the average, only forty-seven per cent. of the theoretical heating power of the fuel is utilised, the remainder being lost through imperfect combustion, radiation, and other causes.

NOTE ON THE ADMINISTRATION OF PHOSPHORUS.*

BY DR. E. R. SQUIBB.

NOTE BY THE EDITOR.—The first portion of this paper, which, for want of space, we are compelled to omit, is more particularly devoted to a discussion of the therapeutical effects of phosphorus, and of the eligibility of various vehicles for its administration. On the first of these subjects there is given much information of value to the physician, and for those who wish to read up the literature of phosphorus more thoroughly, a list of authorities is given. Amongst these may be named Wagner, of Berlin, (*Archives* for 1872, vol. LV. p. 11.) J. Ashburton Thompson, of London, ("*Free Phosporus*," published by H. K. Lewis, 136 Gower St., W. C.) and Lemaire (*Bulletin General de Therapeutique*, Sept. 1875.) The objections to the various vehicles which have been proposed for the solution or suspension of phosphorus are stated in great detail by the author and a decided preference is shown for cod liver oil. In regard to this Dr. Squibb says: "From all that has been written upon the subject it seems to be pretty well established that *phosphorus* should only be given in solution, and that the solvent used should be bland and not volatile, and should be capable of protecting the substance from the oxidation for a reasonable length of time when protected from light and air. Such a solvent has been found in cod-liver oil, and the testimony in regard to this solution in cod-liver oil, up to this time, so favourable as to indicate that all other preparations should be abandoned. It is therefore the object of this note to show that a definite uniform solution of phosphorus in cod-liver oil may be easily made and easily managed, so as to give an opportunity to the physician and pharmacist to use it with great accuracy and safety by ordinary extemporaneous prescriptions, allowing the physician to change his dose, and mode of administration, as each case may require in its different conditions and stages. This should put medication by free phosphorus under the same conditions, for accurate observation, with other potent remedies, and would enable physicians sooner to determine its true position and more accurate value in the materia medica by bringing it within their entire control, and responsibility. It is so very difficult to prevent phosphorus from oxidation when in contract with substances containing oxygen; and when in contact with substances which contain no oxygen, so difficult to prevent its combination with other elements, which impair, or destroy activity, that it is not easy to understand how it can ever reach the circulating fluids of the body, as free or uncombined phosphorus. Yet that it does so seems now pretty well established; and

*Read at the meeting of the American Pharmaceutical Association, and furnished to our correspondent.

if it does so, a solution under the protective agency of a combination in oil globules, which by emulsion in the intestinal tract, pass into the chyle, is the most rational. Whether its ultimate effect in the tissues be as phosphorus, or as phosphorus acid, must still be very doubtful, when it is remembered that before reaching the tissues, it is ærated in the lungs. That phosphorus can never be effectively employed but in its free and most active state (Thompson, p. 9) is abundantly disproved by the experience of this country, and epecically by the systematic observation in large hospitals for the insane, see especially a paper on "the Physiological action and Therapeutic uses of the Acidum Phosphorium dilution" by Judson B. Andrews, M.D., assistant physician in the New York Lunatic Asylum" published in the American journal of Insanity for October, 1869. In regard to the specific action of phosphorus upon the bones, Wagner says "For the therapeutic application it is in general more advisable to make use of the phosphorus in substance than the phosphorus in phosphoric acid. If any considerable action is to be developed by the two latter preparations they must be used in doses which, in animals, at least disturb the digestive apparatus to a high degree." The officinal (U. S. P.) dilute phosphoric acid is very efficient in doses of 20 m=1.25 cc to 30 m 18.75 cc given three times a day, such doses contain in the first about 0.65 grs=45 milligrams; the second about 0.98 gr.=68 milligrams of phosphorus. The equivalent doses of uncombined or free phosphorus should be about 1.60 to 1.40=to 1 1⅓ milligrams. Therefore the quantity of phosphorus given in the condition of phosphorus acid is nearly 50 times greater than when given as free phosphorus to produce an equivalent therapeutic effect, provided the effect be the same, and not 800 to 1000 times greater, as in Wagner's experiments on the lower animals, to obtain his effects upon the tissues. This part of the subject is much in need of closer investigation, and it is to be hoped that Dr. Andrews, or some other careful observer, who may be equally familiar with the uses and effects of phosporic acid, will compare it with free phosphorus, and give the result to the profession when some means of accurate dosing of free phosphorus is afforded, as by the note. Refering them to the numerous authorities for what has been written on the subject of the effects and modes of admistration of free phosphorus, it is here proposed to dismiss all the formulas for its administration, except that which up to the present time may be conceded to be the best, namely its solution in cod-liver oil, and to do so formulate and elaborate this mode of administration that it may afford a safe and uniform practice, as a basis for more accurate observation and more exact experience; and may enable the physician to prescribe, and pharmacist to dispense the substance accurately and conveniently, in any dose, as with other articles of the Materia Medica; the object being to get the phosphorus into the stomach without oxidation, and yet in a condition to be all readily

absorbed and active. A secondary object is to administer it in such a variety of forms as may adapt it to different conditions of stomach and palate, and render it as little disagreeable as may be consistent with the primary object of keeping it free from oxidation and active.

SOLUTION OF PHOSPHORUS.

Take of phosphorus, well dried, 1 part, cod-liver oil, 99 parts; put the cod-liver oil in a bottle, which will be about three quarters filled by it; fit two corks to the bottle, set one aside, and fit the other with two small glass tubes, one short, the other to reach very near the surface of the oil when the cork is in the neck of the bottle; then pass a current of dry carbonic acid (carbon dioxide) into the bottle through the longer tube for about 15 minutes, or until the air is all driven out and replaced by the gas; counterbalance a vessel of water on a good scale, and weigh into it the phosphorus which has been cut into as large and as few pieces as possible, under water; in another shallow vessel, having one or two small pieces of phosphorus in excess of the weight required; then put ice into the water with the weighed phosphorus and set it aside for half an hour, next counterbalance a dry capsule and add to the counterbalance the exact weight of phosphorus required, chill the capsule well by immersion in iced water, dry it and replace it on the scale; then take the pieces of chilled phosphorus from the water one at a time: dry them rapidly with a soft absorbent towel or with good bibulous paper, and place them in the chilled capsule on the scale until the exact weight of dry phosphorus is obtained, then remove the perforated cork from the bottle; drop the pieces of dry phosphorus rapidly into the oil and put in the unperforated cork which had been fitted and set aside; set the bottle in tepid water, and warm the water until the phosphorus melts, and shake the mixture until the phosphorus is entirely dissolved, keeping it at about the same temperature till the solution is effected. Remove the longer tube from the perforated cork and replace it with a syphon, the short leg of which should reach to the bottom of the bottle, and then replace it in the bottle of solution, connect the india-rubber tube of the self-regulating reservoir of carbon dioxide to the short tube of the cork, and put the pressure of the reservoir on to the bottle. Fit the end of the long leg of the syphon with a short piece of india rubber tubing, and the other end of this tubing with a piece of small glass tubing about 2 inches—5 centimeters—long, and put a pinch-cock upon the india rubber tubing, the bottle being placed upon a stand some 6 inches—15 centimeters—high; then carefully open the pinch-cock and suck over the solution so as to fill the long leg of the syphon. Finally, by means of the syphon and pinch-cock, fill the solution into dry, ground-stoppered bottles, of not more than one fluid ounce—30 cubic centimeters—capacity, allowing the carbon dioxide to fill the bottle from the drying apparatus of the reservoir as the solution is drawn

out. In filling the bottles the glass tube should pass to the bottom and the bottles be filled as full as safe, leaving the least practicable room for air, and they should be at once tightly stoppered and left in a cool dark place. The writer has found no way of avoiding oxidation and the formation of pellicle except by the use of carbon dioxide as above described, and no better way of accurately drying and weighing the phosphorus than that described. In all attempts to do without chilling, some fragments or the whole took fire before it could be properly dried and got into the oil. This solution of phosphorus has the sensible properties of the cod-liver oil from which it is made, and the oil should be as limpid, as bland, and as free from odour and taste as possible, and must be entirely free from rancidity, except that a slight odour of phosphorus is superadded. When exposed to the air it emits white vapour in small amount, and becomes covered with a dark brown pellicle. This pellicle protects the oil below from rapid change. In dispensing the solution from a one ounce bottle this pellicle forms after the first portion has been taken, and increases in quantity to the last; it generally adheres to the sides of the vial, the oil from below breaking it at each dispensing. No part of the pellicle should ever be dispensed, nor should the last half drachm of the vial be used. The solution should be dispensed, and the dose be calulated always by weight. It is a one per cent. solution and, therefore, every 100 grs. contain 1 grain of phosphorus; each minim weighs 0·88 or $\frac{7}{8}$ of a grain and, therefore, represents 0·0088 grs. of phosphorus. This solution might perhaps be improved by previously decolorizing the cod-liver oil by filtration through carefully prepared animal charcoal, and also, perhaps, by adding to the oil, say, one twenty-fifth of its weight of strong ether, to give an atmosphere of the vapour in the dispensing bottle to protect against air and oxidation. The writer has not had time to try these, but should they prove practically advantageous he intends to adopt them in the preparation.

Administration of the Solution.—Perhaps the best and most simple means of giving the solution is by a further definite dilution with cod-liver oil. If, as it is not unfrequently the case, small doses of phosphorus are indicated in conditions which require cod-liver oil, or in cases primarily needing phosphorus wherein cod-liver oil would be a useful adjunct, the following dilutions would be convenient: Counterbalance a bottle containing a pint of cod-liver oil, and then pour into the oil 64 grs. or 4 grammes of the solution. This gives a dilution of one fiftieth of a grain or $1\frac{1}{3}$ milligrammes of phosphorus in each $\frac{1}{2}$ oz. fluid-drachms, or $7\frac{1}{2}$ c.c. of this dilution, representing 1-100 grain of phosphorus, given immediately after each meal is very effective, and not very liable to interfere with digestion. Four fluid ounces of cod-liver oil weighs about 1,700 grains or 110 grammes; if to this be added 64 grs. or 4 grammes of the solution, each fluid-drachm of mixture represents 1-50 grs. $1\frac{1}{2}$

milligrammes of phosphorus; one, two, three and four fluid-drachms of this dilution, severally, represents the doses in which phosphorus is required, namely, 1-50, 1-25, 1-16 and 1-12 grains when active medication by phosphorus is indicated. Mr. George C. Close, an able pharmacist, of Brooklyn, makes an admirable emulsion of cod-liver oil, which is quite well adapted to either of these dilutions. The writer is indebted to Mr. Close for the following formulas and directions which will be found very useful. The formula for an emulsion of cod-liver oil simply is as follows: cod-liver oil, four fluid ounces; glycerine, nine fluid drachms; sp. ammon arom, one fluid drachm; sherry wine, twenty fluid drachms; tincture or essence bitter almonds (1 part bitter almonds to 64 parts alcohol) two fluid drachms. Put the glycerine in a mortar and add the oil to it very slowly, triturating the mixture actively and constantly. The success of the emulsion depends upon the skill with which the first small portion of the oil is rubbed up with the glycerine, therefore the oil must be added in very small quantity, and very slowly at first; after the oil is all in, add the other ingredients in the order in which they are named. In the large and successful use of this emulsion, half an ounce of sherry wine has often if not commonly omitted and the same quantity of dilute acid. phos. substituted. The dose of this emulsion is from a dessertspoonful to a tablespoonful. Jamaica rum or brandy may be substituted for the sherry wine when preferred. Of all modes of giving cod-liver oil this is perhaps the least objectionable to most persons. In using the formula as a vehicle for giving the phosphorus, the solution of phosphorus is made a part of the cod liver oil. For example, take half the quantities of the formula, and for this four fluid ounces emulsion take 7·70 grains of cod-liver oil, and 80 grains of solution of phosphorus, then a teaspoonful dose will represent 1-40 grain of phosphorus. Thompson says that oil of peppermint covers the taste of free phosphorous better than anything tried by him. The glycerine which is so useful in emulsifying oils is made as follows: Take the yolks of eggs, carefully excluding the whites, four parts; glycerine concentrated and odourless, 5 parts; beat or whip well the yolks of the eggs in the usual manner, and pour the liquid into a bottle; add the glycerine and shake them well together. This glycerine keeps well for an indefinite length of time. It was introduced from French pharmacy many years ago, and as an emulsifying agent and preservative of emulsions deserves to be better known. Emulsions made with it, by ordinary skill, and accuracy to the above-given directions, never separate; if they separate it is for want of proper care in the commencement of introduction of the oil. This solution of phosphorus may also be given in the form of a pill, and whether in pill or in powder, to be mentioned hereafter, it is always as a solution that is given since the solvent does not evaporate but remains to hold and protect the phosphorus.

To be continued.

Editorial.

AMERICAN PHARMACEUTICAL ASSOCIATION.

From a report of the recent meeting of this association, which will be found in another part of this number, it will be seen that the invitation tendered by the Ontario College of Pharmacy has been accepted, and that the next meeting will be held in this city, on September 4th, 1877. We are sure no effort will be spared in rendering the visit agreeable to our American friends, and, on the other hand, we, as Canadians, anticipate no small share of pleasure and profit in listening to the discussions of the convention, and in meeting socially with its members. The Association have elected Mr. Henry J. Rose, of Toronto, to the position of Local Secretary, and in this respect have certainly made a very happy choice. With the co-operation of the large and influential Committee appointed by the Council, there can be no doubt that all the necessary arrangements will be as perfect as possible.

CENTENNIAL AWARDS TO CANADIAN EXHIBITORS.

The Centennial Commissioners have not yet given in an official report of the awards, but it has been announced that the judges have completed their work and that no further awards will be made. Various lists have been published as the work of adjudication has been progressing, and from these we select the names of the successful Canadian competitors in Group III., which embraces Chemical and Pharmaceutical Preparations, with Apparatus.

The Judges in this department were Messrs. Odling, Great Britain; Wagner, Germany; Kuhlman, France; DeWilde, Belgium; Paterno, Italy; and Messrs. C. H. Joy, F. A. Genth, J. L. Smith, C. F. Chandler, and J. W. Mallet, of the United States. The awards consist of medals, accompanied with diplomas setting forth the particular excellence of the exhibit. These have been given as follows:

Albert Toilet Soap Company, Montreal—Soaps and oils.
Buchanan Mineral Paint Co., Hamilton—Mineral Paint.

Cowan, Alexander, Brockville—Superphosphate and its materials.
Freeland, R., Montreal—Apparatus for Soap boiling under pressure.
Gray, Young & Sparling, Seaforth—Salt.
Harrison & Evans, Goderich—Salt.
Hood, A. W. & Sons, Montreal—Soaps.
International Salt Co., Goderich—Salt.
Lefebon, M., Montreal—Vinegar.
Lyman Brothers & Co., Toronto—Chemicals.
Lymans, Clare & Co, Montreal—Pigments, Oils, &c.
Morse, G. W. & Co., Toronto—Soaps and Candles.
Ramsay, A. & Son, Montreal—Paints.
Ramsay, T., Montreal—Pigments.
Troop & Co., London—Paraffin, etc.

The above list refers to the International Medal granted by the Centennial Commissioners. In addition to this there have been made certain awards by the Canadian Government to exhibitors in the Canadian Section. The Dominion Medals in Group III. are as follows:

GOLD MEDAL.

Waterman Brothers, London—Petroleum, etc.

SILVER MEDALS.

Lyman Brothers & Co., Toronto—Pharmaceutical Preparations.
Brockville Chemical Co.—Chemical Products.

BRONZE MEDALS.

Hood, A. W. & Sons, Montreal—Soaps.
Ramsay, T., Montreal—Paints.

DRUGGISTS' ASSISTANTS' ASSOCIATION CONCERT.

By referring to the Reports of Meetings it will be seen that the Druggists' Assistants' Association contemplate getting up a Concert, to be held in the Music Hall, sometime during this month—probably on the 17th. The services of a number of professionals and amateurs have been secured, and there is every likelihood that the affair will be a success. The primary object of this concert is that of raising funds to purchase books for a Library, and also to assist in the maintaining of Classes during the winter. It is to be hoped that this very laudable undertaking will receive the patronage which it deserves.

School of Practical Science.—Lectures on Chemistry will be given on Monday and Friday evenings at eight o'clock; and on Botany, on Wednesday evenings, at the same hour. Tickets for the course may be obtained, without charge, by applying to Dr. Ellis; between 9 a.m. and 5 p.m. daily. Applications should be made at as early a period as possible.

Editorial Summary.

Liquid Extract of Pareira.—A very interesting and practical paper on this subject was read by Mr. B. S. Proctor, at the last meeting of the British Pharmaceutical Conference. Three samples of the extract of pareira, as furnished by respectable firms, were examined, and the results compared with those shown by two extracts prepared by Mr. Proctor. In the manufacture of one of these—designated No. 4—the pharmacopœial process was followed; the other—No. 1—was prepared by mixing one pound of powdered pareira of a fineness of 120 to the inch, with one pint of boiling water, allowing the mixture to cool, and then introducing into a wide conical percolator, and pouring on successive pints of boiling water until the percolate amounted to sixty fluid ounces, when the exhaustion was considered complete. The first ten ounces of the percolate were collected apart and mixed with three ounces of rectified spirit; the remainder of the percolate was evaporated down to three ounces and mixed with the reserved portion, making the total product sixteen ounces. A comparison of the entire series was made by observing the number of mimims of extract No. 1 required to be added to one fluid drachm of water in order to communicate the same intensity of taste. No. 2 required 45; No, 3, 25; No. 4 30; and No. 5, 12 minims. The commercial samples are indicated by the numbers 2, 3 and 5. A further comparison was made by weighing the dry residue of 100 grains of each of the five samples, and it was found that the results corresponded very nearly with those obtained by the first method:

No. 1	specific	gravity	1·0504	yielded	15·5	grains	residue.
2	"	"	1·0226	"	10·0	"	"
3	"	"	1·0108	"	6·0	"	"
4	"	"	0·9930	"	3·5	"	"
5	"	"	0·9888	"	3·0	"	"

This comparison suggests that in the commercial samples the process had only been carried so far as to extract those portions of matter most soluble, and to leave large portions of extractive matter

equally sapid, and probably equally active. The author ascribes the difference of strength to the variable comminution of the drug, and urges the importance of the Pharmacopœia adopting some system of indication of fineness for powers used for the manufacture of this and other preparations. The continuance of the process of digestion ordered in the B.P. was not considered essential, and it was thought that the quantity of the percolate might be restricted to three pints instead of one gallon. As a security against imperfect work it was suggested that the percolate should be evaporated to a stated density before the addition of the spirit. It was found that the root, when thoroughly exhausted, yields about 17 per cent of dry extract, or about 25 per cent. of an extract of soft pilular consistence. Either of these solid extracts might be used for the preparation of a liquid extract little liable to vary in strength, and corresponding pretty closely with the best that can be prepared by the official process. On dissolving the solid extract a brown insoluble matter is deposited, but the clear liquor possesses the same intensity of color and taste as the original sample. The discussion which followed the reading of Mr. Proctor's paper was very interesting. In most cases the opinions given were favourable to the author, though in regard to limiting the quantity of the percolate to three pints there was some disagreement. It was also suggested that there was a possibility of the experiment not having been made on genuine pareira, as there is very little of that article to be obtained at present. The samples were taken from a parcel of powdered pareira purchased of a respectable drug house. It was also stated that the yield of extract from old and young roots was not alike. The opinion of the meeting was decidedly favourable to the definition of pharmacopœial terms relating to the fineness of powders and the embodiment of these definitions in the next edition of the B P.

Researches on the Alkaloid of Ipecac.—Our valued contributor "Monad" sends us a translation of a paper by M. A. Glenard (*Annales de Chimie et de Physique,*) which, from its extreme length, we are unable to publish entire, and can only offer a summary of the most important points. The attention of the author was specially directed to this subject some ten years ago, when occupied with researches on cinchona, and on the extraction of quinine by lime and ether. It was thought that the process might be extended to other alkaloids, and an experiment was made on ipecac. It was found that when a few grains of this substance were moistened with water, mixed with an equal weight of slaked lime, and then agitated with ether, a solution was obtained, from which, by means of any very dilute acid, and ammonia, there was deposited a large quantity of colourless emetine. This result was

surprising as being in contradiction to the statements of authorities on emetine, who represented it as scarcely soluble in ether, and only obtained colourless with difficulty. The researches of M. Lefort, in 1869, again called the author's attention to this subject, and the experiments made since then form the basis of the paper under review. In the experiment first described 100 grains of alcoholic extract of ipecac were heated in a water bath, with water; sufficient slaked lime—about 150 grams—was added to bring the whole to the state of powder. This was percolated with ether until apparently exhausted. The calcareous residue was examined, and found to contain a very small quantity of emetine; so small as to be practically of little account. The etherial solution was agitated with 100 c. c. of distilled water, containing 5 grains of hydrochloric acid, and allowed to separate. The aqueous layer was coloured yellow, with a slight fluorescence, and contained the emetine. It was divided into two parts. To one of these was added ammonia, which threw down an abundant white precipitate. This was washed and dried, and during the process it diminished in bulk and finally appeared in small, hard, resinous fragments. This substance, when powdered, possessed all the characters of pure emetine. The other portion of the solution was, with great care, evaporated to about one-fourth its original volume, and set aside. Small crystals began to form, and, after a short time, the liquid solidified into a crystalline mass, which was made up of round, fine needles, embracing each other, and radiating from a common centre. This result is completely at variance with other authorities, who describe the salts of emetia as uncrystallizable, and especially with that of M. Lefort, who speaks particularly in regard to the hydrochlorate. On the strength of this experiment, M. Glenard claims that by the use of lime and ether we may remove from the extract of ipecac all the emetine it contains, and that the alkaloid so obtained differs so much in purity from that prepared by other methods that it may be readily brought to the state of crystallized hydrochlorate, which cannot be done with emetine as previously known. It is not necessary that the extract of ipecac be employed, as the powdered root may be employed with as good results. It should be moistened, mixed with lime, dried, and then percolated with ether. This plan is attended with the inconvenience of operating with ether on a very bulky powder. The author prefers the following method: Ipecac, in powder not too fine, is mixed with two and a-half times its weight of distilled water, containing 20 grams of sulphuric acid to the litre. The mixture is allowed to stand a few hours, and filtered. The powder is washed until the washings are colourless. To the liquor is added a large excess of thick milk of lime, and the deposit collected on a filter and washed. The greater portion of the emetine is contained in this deposit, but the liquor also contains a small portion of alkaloidal matter. For

the extraction of emetine from the deposit, either ether or benzine may be employed, and the after treatment of the solution is similar to that in which extract of ipecac was used. It is possible that petroleum benzine might be substituted for the above-named solvents. With regard to the precipitation of emetine from its hydrochlorate, the author states several interesting facts. When ammonia is added to a solution of this salt the whole of the alkaloid is not precipitated, whatever be the quantity or whatever be the state of solution as regards neutrality. An acid solution will, however, retain more than a neutral one, and the quantity retained is in proportion to its acidity. At first sight one is inclined to account for this by saying that emetine is soluble in the ammonia salt, but on more careful examination it appears likely that there is a genuine chemical union between these bodies, and that a double hydrochlorate of emetine and ammonia is formed. Several proofs are given in support of this opinion. It becomes interesting to inquire whether this combination is peculiar to this particular ammonium salt and to emetine. That other salts or alkaloids form similar combinations the author thinks probable, and, at all events, the subject forms the matter for interesting and perhaps fruitful researches. The second chapter or portion of M. Glenard's paper treats of the composition of emetine and its hydrochlorate. In regard to this he differs from Dumas and Lefort, and gives all the details of the analysis by which the ultimate compositive of these substances was determined. Into these particulars it will not be necessary for us to enter, but simply to state that the formula of emetine was determined to be $C_{30}\ H_{22}\ NO_4$; that of the hydrochlorate, $C_{30}\ H_{22}\ NO_4$, HCl.

Remarkable Tolerance of Calabar Bean.—A case is reported in the *Canada Medical & Surgical Journal*, for October, in which a patient suffering from traumatic tetanus, occasioned by a wound from a rusty nail, was treated with the alcoholic extract of calabar bean. As much as twenty-five grains was administered, hypodermically, and one hundred grains, by the mouth, during twenty-four hours. The case was a very serious one, tetanic spasms occurring, at first, every few minutes. The slightest touch or movement brought on a severe spasm. Dr. Drake cut down upon the left sciatic nerve, and grasping it with a strong pair of forceps, pulled it forcibly downwards. The immediate effect of this nerve stretching was remarkable. The muscular rigidity disappeared, the opisthotonos relaxed, the jaws could be opened and the patient was, for a time, without spasms. The hypodermic injection of physostigmatis was commenced, and apparently held the spasms in some degree in check. Dilation of the pupils generally indicated the coming on of spasm, but the pupils were kept well contracted and the man kept

thoroughly under the influence of the bean. The extract was also given by the month, half a grain every quarter of an hour as the condition of the patient seemed to require. The depression of pulse and respiration occasioned by the medicine was counteracted by the liberal administration of whiskey. This treatment was continued during a fortnight with marked amelioration of the symptoms; but, on the fourteenth day, a nurse of the Gamp order drank the patient's whiskey, or at least withheld so great a portion of it, that its effects were missed, and the wretched man expired. The writer says, "This most unfortunate affair is much to be regretted, as the case was progressing so favourably, and bade fair to be a triumph for nerve-stretching and Calabar bean." The *Extract. Iphysostigmatis* was procured from Mr. Gray, of Montreal, and is said to have been of thoroughly reliable quality.

Injurious Action of Marking Ink on Linen.—Dr. B. H. Paul, (*Pharm. Jour. and Trans.*) had occasion to examine a large quantity of linen belonging to a public institution in London, and which had apparently been injured by marking ink. In the centre of each article there had been stamped a monogram, surrounded by a garter about two inches in diameter. When the linen so marked had been some time in use, and had been washed several times, the fibres parted at the ink marks, and, eventually the piece came away altogether. Examination of the marking ink revealed the fact that it consisted of an ammoniacal silver salt, and there was nothing to support the fact that it could produce any corrosive effect. It was also demonstrated that the injury could not have resulted from force in using the stamp. It was, however, observed that some of the marked linen, which had not been washed, was quite uninjured. This apparently furnished a clue to the mystery, but on subjecting two of the articles to a very rough washing with soap and water, repeated about a score of times; and on following up this treatment by boiling one of the articles, with soda, for an entire day, there were no signs of injury such as that complained of. It was thought possible that bleaching powder might have been employed for whitening the linen, and taking into account the fact that silver oxide is converted into silver chloride when brought into contact with a solution of a hypochlorite, and that there is also liberation of oxygen under conditions precisely favourable to the production of ozone, it was conceived that the latter agent might have produced the corrosive effect. In order to test this conclusion, some of the marked articles were dipped into a solution of bleaching powder, when it was found that the linen was cut through in the line of the ink as clearly as if done with a steel punch. With a weak solution the results were not so marked, but the fibre was rendered so weak

that a very slight strain sufficed to pull it asunder, and linen so treated presented all the characteristics of damage shown by that which had passed through the hands of the laundress.

LEECHES.—According to *Chambers' Journal* there are used in Paris some twelve million leeches annually. The demand in France will equal at least five times this number, and these figures will give some idea of the enormous "consumption" throughout the world. Most of these leeches are obtained from leech farms, or reservoirs, which are often of great extent. In the department of La Gironde alone, about ten thousand acres of land have been devoted to this purpose; and but for this industry most of this land would be worthless, or worse than worthless, on account of its swampy and fever-breeding character. The reservoirs are so arranged that they can be inundated or drained at will. During the cold season the leech remains underground, but the first rays of the spring sun bring him out, and then a troop of horses are driven into the breeding-grounds. The leeches attach themselves to the legs of the animals and then gorge themselves. The same troop of horses remain on duty five or six hours, and about ten horses are allotted to each acre. They are then taken to pasture, where they remain eight or ten days to recruit their strength, when they are again made to furnish food for the leeches. This is continued eight or ten times during the three months of spring. The horses do not suffer as much as might be imagined, and often thrive under this treatment. Old horses, whose lives have hitherto been a succession of hard knocks, hard work and fastings, here find a relief from their burdens and enjoy a comparative paradise, which is often continued to them for years. The leeches are taken, in August, by fishers, protected by high boots. They enter the water in line, and advance through the entire bed, beating the water with sticks, and thus arousing the leeches. The larger ones are carefully lifted out and put in bags, with which each person is provided. A farm of four hundred acres will furnish several million leeches yearly, and the profits of the industry are tolerably remunerative, as the cost of maintenance and collection is not great.

THE QUININE FLOWER.—Dr. J. D. Palmer, of Monticello, Florida, contributes to the October number of the *Am. four. Pharm.* a paper on the quinine flower, a substitute for quinine, which has been used with great success ever since the earlier period of the civil war. The quinine flower is an annual, from twelve to eighteen inches high, has an erect green stem, linear leaves about one-half to one

inch in length, and small white flowers. It is a native of Florida, and flowers from July to September. The entire herb is said to possess antiperiodic properties, and the admistration of a saturated tincture, in doses of a teaspoonful every two hours, is generally sufficient to break the paroxysm of fever. The plant is intensely bitter, like quinine, and the sensations of fullness in the head, ringing in the ears, and partial deafness, generally realized after taking quinine, also follow the use of this remedy. Professor Maisch, to whom the plant was sent for recognition, says that he finds it to belong the order *Gentianaceæ*, and to be identical with specimens of *Sabbatia Elliottii*, Steud. Some of the plants belonging to the same genus have been employed as antiperiodics, but Professor Maisch is not aware that any effects resembling quininism have been before noticed in regard to them.

WATER OF CRYSTALLIZATION IN QUININE SULPHATE.—In regard to this subject there are some differences in the statements of authors, nor do authorities agree as to the particular temperature at which the salt becomes anhydrous. A series of experiments made lately by Mr. A. J. Cownley, (*Pharm. Jour. and Trans.*), furnish data for the following conclusions: That the sulphate really becomes anhydrous at 212° F., and when freely exposed to the air in this condition it rapidly absorbs water until it has the composition of a sulphate with two molecules of water. When the access of air is retarded, the water is of a varying quantity and bears no constant relation until the point above noted is reached. Freshly prepared sulphate probably contains $7\frac{1}{2}$ molecules of water, as stated by Jobst & Hesse, but when freely exposed to the air it rapidly effloresces until only two molecules of water are retained. The composition of this salt will be:

Theory.		Molecular wt.		per cent.	Found.
$2\,(C_{20}H_{24}N_2O_2)$	=	648	=	82·81	——
SO_4H_2	=	98	=	12·53	——
$2OH_2$	=	36	=	4·60	4·80
		782		100,00	

The composition of the freshly prepared and uneffloresced salt will be:

$2(C_{20}H_{24}N_2O_2)$	=	648	=	73·56	——
SO_4H_2	=	98	=	11.12	11·17
$7\frac{1}{2}OH_2$	=	135	=	15·32	15·27
		881		100·00	

ARROWROOT.—Mr. Greenish, (*Pharm. Jour. & Trans.*), traces the origin of the term "arrowroot" to a native Indian word "aruta" signifying mealy root. It was the practice of the Indians to eat the root without other preparation than roasting it in hot ashes; it therefore appears natural that a native would apply just such a word to a root that he found to yield so large a proportion of a farinaceous substance as the maranta or the cassava. The author takes exception to the general use of the term arrowroot, and thinks that in published official scientific documents the term starch should be employed in a generic sense to designate the organized structure observed, and its source added to distinguish the particular kind, as the starch of a maranta, or the starch of a manihot. Mr. Greenish reports having examined a mixture, sold as arrowroot, which contained a considerable portion of cassava starch. Mr. H. W. Jones notes similar cases of adulteration and says that, during the last few months, considerable quantities of this article have been put upon the market. A case of substitution is reported in the Danish journals, in which the starch from *Tacca pennatifida* altogether replaced that of maranta. The appearance of this sample was perfect, but the microscope at once revealed the fraud.

COMPOSITION OF COLORLESS TINCTURE OF IODINE.—Mr. N. H. Darling (*Pharm. Jour. & Trans.*), expresses the opinion that the efficacy of decolorized tincture of iodine must be for the most part attributed to the iodoform it contains. It is assumed that this substance is present in considerable quantity, and the author says that when preparing the tincture, by means of ammonia, he noticed the formation of spangles of what he subsequently determined to be iodoform. This view of the subject does not coincide with that of Curtmann, who states the result of the reaction to be ammonium iodide of iodate, ethyl iodide, and an iodide of an ethyl substituted ammonia. According to Curtmann the best proportions for decolization are iodine, ten drachms; rectified spirit, thirteen fluid ounces; strong solution of ammonia, three fluid ounces. Hager recommends the use of sodium hyposulphite, which is mixed with the iodine and some water and heated until colorless, when ammonia and alcohol are added. This solution is said to contain iodide of triethyl ammonium, which, in course of time, decomposes into ethyl iodide, sodium iodide, and triethylamine. Neither Curtmann nor Hager mention the formation of iodoform.

NEW INSECTICIDE FOR HERBARIA.—Collections of dried plants are liable to be infested by various insects, which, if left alone, will

soon destroy them. Foremost amongst these enemies is the *Anobium pertinax*, but M. J. Schnetzler (*Repert. de Pharm.*), finds that both insect and larvæ are quickly destroyed by the vapor of carbon bisulphide. A few ounces of this liquid may be poured upon the bundles of leaves, which should then be laid aside, in air-tight cases, for about a fortnight. The carbon bisulphide should be previously tested in order to ascertain whether it will evaporate without producing stains on paper.

PRESENCE OF FREE ACETIC ACID IN OPIUM.—A short note on this subject was read by Mr. D. Brown, at the British Pharmaceutical Conference. It was stated that if an aqueous extract of opium be submitted to distillation, free acetic acid, with traces of butyric acid, may be found in the distillate.

TEST FOR THE COLOURING MATTER OF SAFFRON.—At the meeting above referred to Mr. W. W. Stoddart described a test for saffron. A minute portion of the liquid to be examined is put in a test tube, and, if the liquid do not already contain sugar, a crystal of that substance is added. Hydrochloric acid is now used until the liquid is decolorized. If the mixture be now brought to the boiling temperature, the colour will again appear and a beautiful fluorescence may be observed on the surface of the liquid. This test is said to be exceedingly delicate. The colouring matter of turmeric exhibits similar appearances, but a preliminary test by alkali—which affects tumeric but has no effect of saffron—will decide this point.

INJECTION BROU.—According to Hagar the composition of this popular remedy is as follows: Sulphate of Zinc, one part; acetate of lead, two parts; tincture of catechu, four parts; Sydenham's laudanum, four parts; distilled water to two hundred parts, by weight.

OIL OF ERIGERON CANADENSE IN GONORRHŒA.—Dr. G. A. Stark, (*Can. Med. & Surg. Rep.*), gives several instances where this agent has been used with marked success. Before using the medicine, a liberal dose of fluid citrate of magnesia U.S.P was taken and followed by: Ol. Erigeron Canadense, two drachms; Syr. simplicis, two ounces. The mixture, of course, requires shaking be-

fore being administered. The dose is a teaspoonful every four hours. With due attention to diet a cure was generally effected in about a week, though sometimes a longer treatment was necessary.

Liniment of Iodide of Ammonia.—The *Phila. Med. & Surg. Rep.* publishes Dr. Gazzo's formula for this liniment: Iodine, three drachms; Iodide of ammonia, ten drachms: rub in a glass mortar, and add chloroform, ten ounces. When solution is effected add olive oil, ten ounces; glycerin, five ounces. Mix well.

Proceedings of Colleges and Societies.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Reported by L. W. Yeomans.

The twenty-fourth annual Convention of the American Pharmaceutical Association was opened at Philadelphia, Tuesday afternoon, September 12th, at the rooms of the College of Pharmacy. The President, Mr. George F. H. Markoe, of Boston, called the meeting to order at 3 o'clock. Mr. John M. Maisch, of Philadelphia, acted as Secretary. About one hundred and fifty members were present, including delegates from thirty-three different Associations and Colleges of the United States and Canada, a larger number than ever attended the annual meeting.

After the appointment of a committee on credentials, a short and able welcoming address was delivered by the President, in which he detailed the beginning of the Association in New York, October 15th 1857, and the permanent organization effected a year later at Philadelphia. He said that "the present condition of the Association will be a lasting memorial to the men who were instrumental in instituting it," and predicted a yet more glorious future than has been experienced in the past. After alluding to the wisdom displayed in the organization of the Association, the speaker paid a tribute of respect to the prominent pharmacists who had passed away. The President's address over, the Executive Committee reported 106 applicants for membership, who were elected as members by ballot. There being no exhibit this year, in connection with the Association, a special committee was appointed to examine specimens of chemical and pharmaceutical preparations displayed at the Centennial

Exhibition and to report to the Executive Committee, which report will be embraced in the published proceedings of this year. The Committee of Arrangements reported the programme, which was adopted; Wednesday, September 13th, visit to the Exhibition, in the evening reception at St. George's Hall; Thursday, September 14th, meeting of the Association; Friday, September 15th, visit to the Exhibition; Saturday, September 16th, meeting of the Association, at 2 p.m., a drive through Fairmount Park for the visiting ladies; Monday, September 18th, excursion to the Switchback. On motion it was resolved to hold evening sessions on the days appointed for regular meetings. After appointment of a Nominating Committee the Association adjourned until 7 o'clock on Thursday evening. Before adjourning, the free use of the Zoological Gardens, Philadelphia Academy of Natural Sciences, the Union League House, Tuft's Soda Water Pavilion, and the Masonic Temple was extended to the members of the Association.

On Wednesday morning the members of the Association were met by the Local Committee, and the day spent at the Centennial Exhibition in examining the chemical, botanical and pharmaceutical displays. To here enumerate the endless variety of exhibits examined, or perhaps more frequently passed without a moment for examination, would be impossible. The labours of a day seem as nothing when you realize that weeks, or even months, could be profitably spent here, in examining the especial products of science or nature which are interesting to the pharmacist.

To give those who will not be able to visit the Exhibition some idea of the magnitude of these displays, the exhibit of chemicals by Messrs. Powers & Weightman may be referred to, valued at about $45,000. The space occupied by this firm is about 12 ft. square, and arranged as a sample room. On entering from the West you pass, on the right, a pyramid of sulphate of quinine, about four feet square at the base, and about 5 feet in height, value about $2,500; on the left stands a pyramid of sulphate of morphia, not quite so large, value about $3,500; immediately in front, and in the centre of the room, stands one immense crystal of alum, weighing between 3 and 4 tons. Arranged then, on either sides, are the chemical preparations manufactured by the firm, and from their perfection and variety all are disposed to admit that Messrs. Powers & Weightman well merit the high reputation they bear. Several other exhibits might be mentioned, almost, if not equal to this, but space will not permit.

The evening entertainment, at St. George's Hall, was conducted in the munificent style which characterizes all American undertakings of this nature. The hall, which is one of the largest and the finest in the city, was filled with a gay and fashionable company, all intent upon an evenings enjoyment, and your delegates can testify there was no room for disappointment in this respect.

The entertainment commenced at eight o'clock, with a promenade concert, and about ten, the company sat down to a supper which would tempt the gods. After doing ample justice to this, dancing was commenced and continued with much spirit until the small hours of the morning.

The Association re-assembled next morning, at 9 o'clock, Dr. Frederick Hoffman, of New York, Vice-President, occupied the chair. The following gentlemen were recommended by the Nominating Committee, and elected by acclamation, as officers for the ensuing year:

President—CHARLES BULLOCK, of Philadelphia.

Vice-Presidents—A. D. SHEPPARD, of Boston; GUSTAVUS J. LOON, of Charleston, S. C., & JACOB D. WELLS, of Cincinnatti, O.

Treasurer—CHARLES A. TAFTS, of Danvers, N. H.

Permanent Secretary—CHARLES A. MAISCH, of Philadelphia.

Reporter on Progress of Pharmacy—C. LOUIS DIEHL, of Louisville, Kentucky.

Executive Committee—G. W. KENNEDY, of Pottsville; G. W. DALYRIMPLE, of Norristown; W. H. CRAWFORD, of St. Louis; and J. INGALLS, of Macon, Ga.

Committee on the Drug Market—WM. SAUNDERS, of London; W. WICKHAM, of New York; J. F. JUDGE, of Cincinnatti; N. G. BARTLETT, of Chigago, and C. F. G. MEYERS, of St Louis.

Committee on Papers and Queries—W. MCINTYRE, of Philadelphia; LEWIS J. DOHNERT, of Baltimore; and JOSEPH L. LEMBERGER, of Lebanon.

Business Committee—JOSEPH ROBERTS, of Baltimore; H. S. WELCOME, of New York; and CHARLES RICE, of New York.

The Executive Committee presented their report for the past year, which stated that the Association numbers 1,066, with twenty honorary members.

The Treasurer reported a balance in the treasury of $1,725 22. The expenditures for the past year were $4,181 67, and receipts $5,906 89. The Committee appointed to confer with the American Medical Association on the growing necessity and value of a list, selected by medical practitioners, of the more powerful and dangerous preparations used by them, giving their maximum doses, and to urge upon them the importance of employing a well defined caution mark prefixed to all such preparations when prescribed in doses exceeding the maximum quantity thus laid down, reported that they had consulted with the Association, and that body had appointed a committee to take some action in the matter.

The Committee on Metric Weights and Measures made a lengthy report on the subject, in which they stated that in the course of eight years the metric-system of weights, measures and coins has become the standard of more than half the civilized world, and that

the universal adoption was only a question of time. As regards pharmacy, the sphere of the pharmacist does not offer substantive chances to take initiative steps or to lead in such a movement. He cannot, in his purchases, force the use of metric-weights and measures upon the original packages of the chemical and pharmaceutical manufacturers, nor employ them independently in his retail sales. All he can do is to make himself and assistants more and more familiar with every detail of the system, to advance the dissemination of such knowledge and to advocate the early introduction of such reform.

This report was followed by a paper by Mr. F. S. Wiegand on "the disadvantages arising from an immediate adoption of the metric-system.

A very interesting paper was read by Dr. Edward R. Squibb, of Brooklyn, on "the administration of Phosphorus, after which the Association adjourned, until 3 o'clock p. m.

The Association re-assembled at the appointed time. Dr. E. R. Squibb offered the following:

Whereas, By action of the American Medical Association, at its recent meeting in this city, it is proposed to discuss, at its next meeting, in Detroit, in June, 1877, a proposition for that association to assume the control of the "National Pharmacopœia;" therefore

Resolved, That this association offers to the American Medical Association its hearty co-operation in the work, in any way that the American Medical Association may find the services of this association most useful.

Dr. Squibb addressed the meeting in support of his resolution, and said that the American Medical Association represented the American Medical profession, pharmacy having sprung from the medical profession as a part of its necessities, being just as much a speciality of medicine as ophthalmology, their interests being indentical in harmonizing to form one pharmacopœia. After a lengthy discussion the resolution was passed.

The Committee on Adulteration and Sophistication presented their report, covering about two quires of foolscap, from which some very interesting extracts were read. Particular attention was given to the adulteration of spices as well as some leading chemical preparations.

Some 12 samples of Cream Tartar were tested, resulting in none proving to be pure, and 5 having no trace whatever of Potas Bitart. Several samples of powdered Black Antimony were tested, and proved to be different proportions of marble dust and powdered Anthracite coal. This report was followed by an address by Mr. Robbins, of McKesson and Robbins, of New York, on the incapability of many who make the experimental tests for impurities, holding that a thorough analytical chemist, of year's experience, was alone capable. After the appointment of several committees, one of which

was "on time and place of next meeting," the meeting adjourned until 8 o'clock, p. m.

At the evening session a report was presented by the Committee on the Revision of the By-laws, and a discussion ensued, occupying about two hours, after the conclusion of which very interesting papers were read by W. H. Pile, of Philadelphia, and J. W. Lloyd, of Cincinnatti. The Association then adjourned until 9 o'clock, Saturday morning.

On Saturday morning, at 9 o'clock, the Association came to order, President C. Bullock in the chair. After reading the minutes, the Committee on time and place of next meeting reported in favour of holding the next anuual meeting on the second Tuesday in September, in the City of Toronto. The report was received with marked satisfaction, and unanimously adopted. Next came the report of the Commitee on the Drug Market, a lengthy and interesting paper, in which, among other things, attention was called to the fact that many drugs were sold in the powder as low or lower than before being pulverized. Succeeding this was one of the most instructive and the most lengthy manuscripts placed before the Association—the Report on Progress of Pharmacy—by C. Louis Diehl. Among improvement in apparatus, E. Gregory's Syphon Filter was especially mentioned and recommended; reference was also made to a new process for manufacture of Acidum Phosphoricum, by Prof. E. B. Shuttleworth; the report was so long that only abstracts from it were read, which occupied considerable time. The meeting then adjourned.

At half-past two o'clock, p. m., the Association re-assembled, and the entire afternoon was occupied with reading of volunteer papers and answers to queries proposed last year, each paper being followed by short discussions of a most instructive character. An essay was read by Mr. Jacob D. Wells, of Cincinnati, on "Seneca Root," embracing the history of its introduction, its geographical range, and its present importance as an article of commerce. A volunteer paper, by Henry A. Rittenhouse, on "Glycyrrhizin," was then read; and a paper by G. W. Kennedy, of Pottsville, on "Paullinia Sorbilis;" next came Dr. Shafer on "What is Lacto-Pepsin?" His experiments seemed to prove it inferior to Pepsin, although it is claimed to be more powerful; on the adulteration of Phosphorus, by Louis Dohme, of Baltimore, showing that out of three samples two were adulterated with arsenic. A paper by Mr. Saunders, of London, on "Cantharides," in which he called attention and showed specimens of several idigenous species; on Emulsions, by E. Gregory, Lindsay. A number of other papers were next read, after which the meeting adjourned. The last session commenced at eight o'clock the same evening, and was occupied until about eleven o'clock in reading papers and discussions upon the same, the Association then adjourning, to meet in Toronto, next year.

Altogether the meeting was an interesting and highly instructive one, and our Pharmacists, in Canada, may congratulate themselves on having in prospect an opportunity of meeting with and entertaining, next September, so large a number of professional and practical chemists and pharmacists, amongst whom are the most advanced in experience and education in America.

DRUGGISTS' ASSISTANTS' ASSOCIATION OF ONTARIO.

The regular monthly meeting of the above Association was held at the Mechanics' Institute, October 4th instant, W. C. Cousens in the chair. After the Secretary had gone through the usual routine of reading the minutes of the previous meeting, ten names of applicants for membership were submitted and passed.

A discussion took place among the members on the advisibility of keeping concentrated solutions ready for use. Messrs. Rowland, Vicars, Stephens, Holgate, De La Porte, and Cousens, expressed their views on the subject, and the general conclusion arrived at was that the employment of such solutions would be quite advantageous in saving time and trouble. Papers were promised for the next meeting by Messrs. Holgate and Blundell. The Chairman then gave a recitation. A committee was drafted to make all necessary arrangements for holding a concert, to be held under the auspices of the Association, the object being to form a library of pharmaceutical works and also to inaugurate a series of lectures during the coming winter months.

The committee on the conversazione reported success in getting up the preliminary arrangements, as quite a number of ladies and gentlemen have kindly volunteered their services.

The concert will be held in the Music Hall, and will very likely take place on the 17th instant.

Registrar's Notices.

Clarke, James, Simcoe.
Fisher, J. H. C. F., Baillieboro.
Hacking, J. H., Listowell.
Hildreth, A. R., Paisley.
Kidd, J. P., Barrie.
Lakeman, A., P. A Landing.
Mitchell, John R., Port Hope.
Sanderson, H., Richmond Hill.
Sanderson, J. H., Richmond Hill.
Sanderson, W. A., Richmond Hill.
Wilson, John, Simcoe.

NEW REGISTRATIONS.

Caldwell, Wm., Lakefield.
Johnston, Thos. George, Sarnia.

DRUGS, MEDICINES, &c.	$ c.		$ c.
Acid, Acetic, fort	0 13	@	0 14
Benzoic, pure	0 22		0 27
Citric	0 90		1 00
Muriatic	0 03½		0 05
Nitric	0 10		0 13
Oxalic	0 15		0 17
Sulphuric	0 03		0 05
Tartaric, pulv	0 44		0 47
Ammon, carb. casks	0 18		0 20
" jars	0 18		0 20
Liquor, 880	0 20		0 22
Muriate	0 14		0 15
Nitrate	0 45		0 60
Æther, Acetic	0 45		0 50
Nitrous	0 40		0 42
Sulphuric	0 45		0 50
Antim. Crude, pulv	0 15		0 17
Tart "	0 50		0 55
Alcohol, 95 per ct. Cash	2 13		0 00
Arrowroot, Jamaica	0 18		0 22
Bermuda	0 50		0 65
Alum	0 02¾		0 03½
Balsam, Canada	0 33		0 38
Copaiba	0 65		0 70
Peru	2 90		3 20
Tolu	3 20		3 40
Bark, Bayberry, pulv	0 18		0 20
Canella	0 17		0 20
Peruvian, yel. pulv	0 35		0 50
" red "	1 60		1 70
Slippery Elm, g. b	0 18		0 20
" flour, packets	0 28		0 32
Sassafras	0 15		0 18
Berries, Cubebs, ground	0 20		0 25
Juniper	0 06		0 10
Beans, Tonquin	1 00		1 20
Vanilla	18 00		24 00
Bismuth, Alb	2 25		2 50
Carb.	2 40		2 65
Camphor, Crude	0 23		0 35
Refined	0 35		0 40
Cantharides	1 65		1 75
Powdered	1 80		1 90
Charcoal, Animal	0 04		0 06
Wood, powdered	0 10		0 15
Chiretta	0 23		0 30
Chloroform	0 00		1 55
Cochineal, S. G	0 72		0 77
Black	80		0 85
Colocynth, pulv	0 60		0 65
Collodion	0 70		0 80
Elaterium	3 20		4 00
Ergot oz	1 20		1 30
Extract Belladonna	1 65		1 80
Colocynth, Co	1 25		1 75
Gentian	0 50		0 60
Hemlock, Ang	0 00		0 95
Henbane, "	2 50		2 60
Jalap	4 50		5 00
Mandrake	1 75		2 00
Nux Vomic oz	0 40		0 50
Opium oz	1 25		
Rhubarb	5 00		5 50
Sarsap. Hon. Co	1 00		1 20
" Jam. Co	3 50		4 00
Flowers, Arnica	0 70		0 80
Chamomile	0 17		0 25
Gum, Aloes, Barb. extra	0 28		0 32
" " good	0 70		0 80
" Cape	0 40		0 50
" " powdered	0 16		0 20
" Socot	0 20		0 30
" " pulv	0 50		1 35
Arabic, White	1 00		0 00
" " powdered	0 38		0 60
" sorts	0 60		2 75
" " powdered	0 19		0 24
" com. Gedda	0 42		0 50
Assafœtida	0 13		0 16
British or Dextrine	0 12		0 20
Benzoin	0 13		0 15
Catechu	0 35		0 75
" powdered	0 12		0 15
Euphorb, pulv	0 25		0 30
Gamboge	0 40		0 45
Guaiacum	1 00		1 20
Myrrh	0 35		1 00
	0 50		0 80

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	
Scammony, powdered	5 50	6 00
" Virg. "	14 50	—
Shellac, Orange	0 50	0 60
Gum, Shellac, liver	0 33	0 40
Storax	0 40	0 45
Tragacanth, flake	1 10	1 75
" common	0 53	0 65
Galls	0 22	0 30
Gelatine, Cox's 6d	1 15	1 20
Glycerine, common	0 18	0 23
Vienna	0 25	0 28
Prices	0 60	0 75
Honey, Canada, best	0 16	0 17
Lower Canada	0 12	0 13
Iron, Carb. Precip	0 16	0 20
" Sacchar	0 40	0 55
Citrate Ammon	1 10	1 20
" & Quinine, oz	0 40	0 85
" & Strychine	0 17	0 20
Sulphate, pure	0 08	0 10
Iodine, good	3 20	3 50
Resublimed	3 90	4 20
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 32
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I	0 14	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 17
Lime, Carbolate brl	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12½
Lead, Acetate	0 13	0 14
Leptandrin oz.	0 60	—
Liq. Bismuth	0 50	0 60
Lye, Concentrated	1 30	1 50
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb 1 oz.	0 20	0 25
" 4 oz.	0 19	0 20
Calcined	0 60	0 65
Citrate gran.	0 60	0 75
Mercury	0 80	0 85
Bichlor	0 90	1 00
Chloride	1 00	1 10
C. Chalk	0 50	0 55
Nit. Oxyd	1 15	1 25
Morphia Acet	3 15	3 25
Mur.	3 15	3 25
Sulph	3 30	3 50
Musk, pure grain oz	25 20	.....
Canton	10 60	1 20
Oil, Almonds, sweet	0 55	0 60
" bitter	14 00	15 00
Aniseed	3 25	3 50
Bergamot, super	5 50	6 00
Caraway	3 20	3 50
Cassia	1 75	2 00
Castor, E. I	0 10½	0 12
Crystal	0 22	0 25
Italian	0 24	0 26
Citronella	1 00	1 10
Cloves, Ang	3 75	3 80
Cod Liver, Imp. Gal	2 00	2 10
Croton	1 40	1 50
Juniper Wood	0 80	1 00
Berries	2 75	3 00
Lavand, Ang oz.	0 00	1 00
Exotic	1 25	1 50
Lemon, super	3 75	4 00
ord	0 00	0 00
Orange	2 40	2 60
Origanum	0 65	0 75
Peppermint Ang	15 00	16 00
" Amer	4 00	5 00
Rose, Virgin	8 50	8 75
" good	6 60	6 75
Sassafras	0 75	0 90
Wintergreen	3 60	5 75
Wormwood, pure	5 00	6 00
Ointment, blue	0 90	0 95
Opium, Turkey	7 60	7 75
pulv	9 75	10 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 35	0 36
" good.	0 15	0 20
Pill, Blue, Mass.	0 90	1 00
Potash, Bi-chrom	0 16	0 18
Bi-tart	0 30	0 32
Carbonate	0 13	0 15
Chlorate	0 30	0 35
Nitrate	8 00	9 00
Potassium, Bromide	70	0 80
Cyanide	0 55	0 60
Iodide	2 75	2 90
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 40	—
Houghton's doz.	8 00	9 00
Morson's oz.	0 85	1 10
Phosphorus	1 10	1 20
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 90	—
" 100 oz. case.	2 85	—
" 25 oz. tin..	2 85	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 08	0 10
" pulv	0 15	0 20
Hellebore, pulv	0 00	0 00
Ipecac, "	1 40	1 50
Jalap, Vera Cruz	90	1 15
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 10	2 25
" E. I.	1 00	1 10
" " pulv	1 10	1 20
" " 2nd	0 60	0 70
" French	0 75	—
Sarsap., Hond	0 60	0 65
" Jam	0 95	1 00
Squills	0 10	0 15½
Senega	0 80	9 90
Spigelia	30 0	0 32
Salts, Epsom	2 60	2 50
Rochelle	0 30	0 32
Soda	0 01½	0 02
Seed, Anise	0 13	0 16
Canary	0 07½	0 08
Cardamon	2 00	2 10
Fenugreek, g'd	0 08	0 09
Hemp	0 06½	—
Mustard, white	0 16	0 17
Saffron, American	0 50	0 60
Spanish	10 00	11 00
Santonine	15 00	15 50
Sago	0 08	0 09
Silver, Nitrate Cash	14 50	16 00
Soap, Castile, mottled	0 11	0 14
Soda, Ash	0 03¾	0 05
Bicarb. Newcastle	4 00	4 25
" Howard's	0 14	0 16
Caustic.	0 03¾	0 04
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 00	2 20
Sulphur. Precip	0 12	0 13
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 70	0 80
Zinc. Chloride oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Aniline, Magenta, cryst	2 00	2 60
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 07½	0 09
Camwood	0 07	0 08
Copperas, Green	0 01½	0 02
Cudbear	0 16	0 25
Fustic, Cuban	0 03	0 04
Indigo, Bengal	2 40	2 50
Madras.	0 75	0 80
Extract	0 26	0 30

DYESTUFFS—*Continued.*		
Japonica	0 07	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 02½	0 03
Logwood, Camp	0 02½	0 03
Extract	0 12	0 13
" 1 lb. bxs	0 15	—
" ½ lb. "	0 16	—
Madder, best Dutch	0 09	0 10
2nd quality	0 08	0 09
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 11½ @	0 12
Cassia	0 26	0 28
Cloves	0 50	0 55
Cayenne	0 17	0 20
Ginger, E. I.	0 14	0 15
Jam	0 25	0 30
Mace	1 10	1 10
Mustard, com	0 20	0 25
Nutmegs	1 00	1 05
Pepper, Black	0 15	0 16
White	0 26	0 28
PAINTS, DRY.		
Black, Lamp, com	0 09 @	0 10
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 26	0 28
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07¼	0 08
Venetian	0 02½	0 03½
Sienna, B. & G.	0 07	0 08
Umber	0 07	0 10
Vermillion, English	0 90	1 00
American	0 25	0 35
Whiting	0 85	1 00
White Lead, dry, gen.	0 08½	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 09	0 15
" Ochre	0 02½	0 03½
Zinc White, Star	0 09	0 11
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 10	0 12
Putty	0 03½	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 35	—
" No. 1	2 10	—
" No. 2	1 85	—
" No. 3	1 60	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	3 00 @	3 25
Rosin, Strained	3 50	3 50
Clear, pale	4 50	5 00
Spirits Turpentine Imp. Gall.	0 56	0 57
Tar Wood	5 50	6 00
OILS.		
Cod Imp. Gall.	0 84 @	0 86
Lard, extra "	1 25	1 27
No. 1 "	1 14	1 16
No. 2 "	1 02	1 05
Linseed, Raw per 7½ lbs.	0 55	0 58
Boiled "	0 59	0 62
Olive, Common Imp. Gall.	1 20	1 22
Salad "	2 04	2 10
" Pints, cases	4 00	4 20
" Quarts	3 25	3 50
Seal Oil, Pale Imp. Gall.	0 84	0 86
Straw "	0 70	0 80
Sesame Salad "	1 56	1 60
Sperm, genuine "	2 55	2 75
Whale refined "	2 55	2 75