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CANADIAN

PHARMACEUTICAL JOURNAL

VOL. IX, No. 5. TORONTO, DECEMBER, 1875. WHOLE No. XC

Original and Selected Papers.

ON SOME ERRORS IN THE STATED STRENGTHS AND DOSES OF THE OFFICINAL PREPARATIONS OF OPIUM.

BY E. B. SHUTTLEWORTH.

Teachers of pharmacy, and others accustomed to classify and compare the various officinal compounds, must have noticed occasional discrepancies and inconsistencies in pharmacopœial statements which are difficult to explain away and which give rise to much uncertainty and confusion in the mind of the student. To direct attention to some of these is the design of the present paper, and the writer is encouraged to believe that this criticism will be received in as kindly a feeling as it is offered. To call into question the correctness of the national pharmaceutical standard was at one time deemed an evidence of bad taste, but that time has happily passed away, and it is now the interest of all to cultivate and exercise a spirit of inquiry, so that our Pharmacopœia may be rendered as nearly perfect as possible.

In the edition of 1867, on page 230, under the head of *Opium*, is an enumeration of the officinal preparations of that drug, and also an estimate of their relative strengths. In this table there are some omissions and errors.

The *Suppositoria Plumbi Comp*, which contain, in each, one grain of powdered opium, are omitted. *Morphiæ Acetas* and the *Liquor* are given, though the hydrochlorate is the only salt directed to be prepared directly from opium.

It is stated that the proportion of opium (moist) in *Trochisci Opii* is one-tenth of a grain in each, while on pages 124 and 350 they are said to contain one-tenth of a grain of extract, which is at least double the strength of moist opium.

The proportion of opium in *Pil. Ipecac. cum Scilla* is said to be 1 in 16½ nearly. The treacle ordered in the formula has evidently been omitted in this calculation. It will be found that this will bring the mass up to a strength of about 1 in 24.

In the Reprint of 1874 the compilers publish, on page vi, "a list of corrections made in 1874 in the reprint of the British Pharmacopœia of 1867." *Only one of these relates to opium preparations*—that of the *Pil. Ipecac. c. Scilla*, above noted, of which the correction is made "instead of 16½ read 23½." On referring, however, to the page indicated, it will be found that another proportion—1 in 23—is given.

The notes for this paper were made with reference to the edition of 1867, but we find that in the reprint of 1874 some of the errors have been corrected, though they do not appear in the list of corrections referred to. This is an omission originating in carelessness, or perhaps some other cause, but, in any case, the list should be made complete.

In regard to the doses of the opium preparations there are some strange inconsistencies. Some of these would at first appear to be explained by the supposition that the stated doses of preparations have been established and perpetuated by long usage, but this view is not correct, as many of the preparations were either entirely new or of altered strength in the edition of 1864, and of those compounds which were taken from the other pharmacopœias the doses do not coincide.

On page 230 of the edition of 1867, and also 1874, the dose of ordinary opium is stated to be from ½ grain to 2 grains. This may then be assumed as a standard to which may be referred other preparations which owe their activity entirely to opium.

The dose of *Ext. Opii* is stated (page 123 in 1867 and 1874) to be from ½ grain to 2 grains, or the same as that of opium, though 2

parts of opium are said to yield about one of extract. It is obviously inconsistent that while the latter is double or more generally more than double the strength of the former the dose should be the same.

Ext. Opii Liquid, and *Vin Opii*, of which 11 (10·9) minims equal one grain of moist opium, are directed to be administered in doses of from 10 to 40 minims, equal to nearly 1 to 4 grains of opium.

The dose of *Tinct. Opii* is given as from 5 to 40 minims. $14\frac{2}{3}$ (14·63) minims equal one grain dry opium, making the dose range from about $\frac{1}{3}$ to nearly 3 grains. Estimating the amount of moisture in commercial opium to average 15 per cent. (an amount which by trials of many hundreds of pounds of opium I have found to be nearly correct), one grain of moist opium would be contained in about $12\frac{1}{2}$ (12·43) minims, and the stated dose would range from $\frac{5}{12}$ to $3\frac{1}{5}$ grains.

This want of uniformity is rendered more evident by reducing to grains of moist opium the pharmacopœial dose:

Opium	0·5 to 2·0 grains.
Ext. Opii	1·0 to 4·0
Ext. Opii Liquid	0·9 to 3·7
Tinct. Opii	0·4 to 3·2
Vin Opii	0·9 to 3·7
Pulv. Ipecac. co.	0·5 to 1·7

It is not for a pharmacist to say what the correct dose of opium is, but whatever may be the amount fixed upon by competent authorities, it seems but reasonable that the doses of the various preparations should be made to correspond as nearly as possible. It may also be maintained that some uniform system of posology should be followed. Whether the average adult dose, or the maximum and minimum dose should be stated, I do not wish to determine, but one or other plan should be rigidly adhered to. From the table above given it is evident that the compilers of the British Pharmacopœia regarded this no more than their alleged rule of reducing to a uniform dose of 15 or 25 minims the more active medicinal tinctures.

Before drawing these remarks to a close I may state that in a foot-note to an article on *Vinum Opii* (p. 368 in editions of 1867 and 1874), that preparation is stated to be one-fifth weaker than *Vinum Opii*, P. L. The B. P. wine contains in each pint 437·5 grains of extract of opium; the P. L. wine 600 grains. The difference is $162\frac{1}{2}$ grains, which is over one-fourth instead of one-fifth.

I append an enumeration of the nearest quantities of the officinal preparations of opium which are equal to one grain of dry opium. The amount of moisture in ordinary opium is taken at 15 per cent.:

Confectio. Opii	40·3 gr.	Pulv. Cretæ Arom. *c.* Opio.	40 gr.
Emp. Opii	10·0 "	Pulv. Ipecac. co	10 "
Enema Opii	1 oz.	Pulv. Kino co	20 "
Ext. Opii	·588 gr.	Pulv. Opii co	10 "
Ext. Opii Liquid	12·8 *m.*	Tinct. Camph. co	½ fl. oz.
Lin. Opii	30·0 *m.*	Tinct. Opii	14·6 *m.*
Morphiæ Hydrochlor	$\frac{1}{10}$ gr.	Tinct. Opii Ammon	96·0 *m.*
Pil. Ipecac. *c.* Scilla	24 "	Troch. Opii	5·8 troch.
Pil. Plumbi *c.* Opio	8 "	Vinum Opii	12·8 *m.*
Pil. Saponis Co	6 "	Supposit. Plumbi co	1 supp.

Ung. Gallæ *c.* Opio.....14·6 gr.

OLEO-PARAFFIN—A SUBSTITUTE FOR LARD IN OINTMENTS*.

BY JAMES F. BABCOCK.

The use of lard as a basis for onitments and cerates has always been a source of trouble to pharmacists. Good lard, suitable for pharmaceutical uses, not being always easy to obtain, most pharmacists at the present time prepare their own, by trying out leaf lard. This is generally a long and tedious operation, and the product obtained, even where great care is used in its preparation, not unfrequently disappoints the operator, by becoming rancid in a few weeks or months, according to conditions which are imperfectly understood, or, at least, incapable of control.

The purpose of the present paper is to suggest a substitute for lard as a basis for ointments and cerates, which, while it has the cheapness of lard, is purer, cleaner, not so liable to become rancid, and yields a much handsomer product.

Perfectly pure fatty bodies or glycerides, as stearin, olein, margarine, &c., or mixtures of them, do not become rancid; but the changes which constitute rancidity are due to the presence of foreign matters of an albuminoid character, derived from the cellular tissue of the plant or animal from which the fatty substance has been obtained.

* From the Laboratory, November, 1875.

These albuminoid substances act as ferments, and, under the influence of moist air, absorb oxygen, undergo decomposition, and influence a change in a small quantity of the fatty bodies in their immediate vicinity. The fatty acids are set free, and these by oxidation produce minute traces of butyric, caproic, and other volatile bodies having a disagreeable odor.

The secret, then, of preserving lard, ointments, or other fatty bodies, consists simply in making them *as pure as possible;* but as the preparation of lard so that it shall be quite free from the albuminous substances, which cause the trouble, is extremely difficult and always uncertain, we propose a kind of artificial lard, prepared from materials which closely resemble the components of natural lard, and may always be obtained in a state of great purity.

Ordinary lard contains about 62 per cent. of a fluid fat called oleine, and 38 per cent. of a mixture of various other fatty bodies, solid at ordinary temperatures, containing stearin, margarin, &c.

The fluid portion of lard—oleine, or lard-oil, as it is called in commerce—is produced in immense quantities in all of the principal cities of the North and West. It is used for lubricating purposes, for oiling wool, for illumination, and many other purposes. It is moderate in price, varying from 60 to 90 cents per gallon. What is known as "Extra" or "No. 1" lard-oil is very light colored, free from disagreeable odor, and keeps well for almost any length of time. This oil is cold-pressed from the lard, and is generally quite free from those impurities which are found in leaf-lard, and if of good quality does not readily become rancid.

The writer has in his possession samples of lard-oil which are about a year and a half old, and still perfectly sweet.

Extra No. 1 lard-oil is admirably suited for the preparation of artificial lard.

To represent the solid portions of lard, we propose paraffin—a body of great commerical purity, of moderate price, and well adapted to replace the stearin in lard, as it always has, to a great extent, replaced it in the manufacture of candles.

Pharmacists have hitherto made but little use of paraffin, because this substance, though perfectly miscible with oils when melted, separates in crystalline scales on cooling, in consequence of which, its use has been abandoned as impracticable.

This difficulty may, however, be almost wholly overcome, so that paraffin may be used as a substitute for wax in ointments, for spermaceti in cold-cream, for stearin in artificial lard; the tendency to separate being obviated by the addition of about one part of wax to every nine parts of paraffin used.

This suggestion was made by the writer in a paper presented to the Amer. Pharm. Association and published in the Proceedings for 1867, and also by Carney, some years previous, but it appears to have been unacted upon.

Very fine results in cerates and ointments are obtained by the use of a wax substitute composed of paraffin three parts and wax one part; these substances being melted together and poured into a suitable mould.

Lard-oil, or the oleine of lard, and the wax substitute composed of wax and paraffin, as above, which represents the stearin, when melted together in the proper proportions, and stirred until cool, yield a product closely resembling lard in its external appearance, and having about the same melting point, but possessing the great advantage that this product, though of the same consistence as lard, can be prepared in such a manner as to contain about 75 per cent. of oleine, instead of 62, as in lard, thus producing an ointment which is much more readily absorbed. The paraffin does not crystallize, but, while it gives consistence, produces a peculiar and beautiful whiteness in the product, like that due to the presence of spermaceti in cold-cream.

This substitute for lard, which we may call oleo-paraffin, is prepared as follows: take of

Lard-oil	15 Troy ozs.
Paraffin	3 Troy ozs.
Wax	1 Troy oz.

Melt the articles at a gentle heat, and when melted, stir until cool.

Oleo-paraffin, as thus prepared, is an excellent substitute for lard and being produced, from substances which are not liable to change, does not readily grow rancid, and does not require to be benzoinated.

To prepare simple ointment, eight parts of oleo-paraffin are melted with two parts of wax, and for simple cerate, eight parts of oleo-paraffin are melted with four parts of wax, as in the processes of the U. S. Pharmacopæia.

Oleo-paraffin may be kept on hand, like lard, or may be prepared every week or two, as required.

The writer believes that oleo-paraffin may be used as a substitute for lard for all pharmaceutical purposes, without the objections attending the latter; the formulas given above may be varied for different seasons of the year, or to meet various conditions, and are offered as a suggestion for further experiments rather than as expressing the best possible proportions.

A CONVENIENT APPARATUS FOR HOT FILTRATION.*

BY H. CARRINGTON BOLTON, PH.D.

Every working chemist has experienced the need of a convenient apparatus for hot filtration. Hot saturated saline solutions which crystallize on cooling in the filter or in the neck of the funnel, and viscid liquids possessing the necessary mobility only so long as a higher temperature than the average is maintained, render the employment of some form of apparatus for *hot* filtration indispensable. While much attention has been given of late to the construction of apparatus for *rapid* filtration, as the innumerable forms of water pumps and steam injectors abundantly show, little has been done towards improving the existing forms of apparatus for hot filtration or the contrivance of new ones.

Two kinds of apparatus have come under our observation. The first of these, invented by Dr. Hare, is the well-known funnel support usually constructed of tinned iron with double walls and a conical aperature for inserting a glass funnel ; the space between the walls being filled with water or other liquid, it is kept at a boiling heat by a lamp placed under a cavity shaped like an inverted funnel. A more compact form of the same apparatus was contrived by Plantamour, in which the metallic box is given the form of a cone, and heat is applied to a hollow cylindrical projection filled with the liquid employed, and communicating with the space between the double walls.

While this apparatus is well adapted to the use of pharmaceutists, or for the purpose of the manufacturer, it is not suited to the wants of the analytical chemist. The first form occupies much space, and both forms must be had in great variety of sizes to fit funnels of various dimensions. A small funnel is nearly lost to view in a large jacket, and a large funnel is not heated by a small one. Then again, only well-made funnels, whose sides are inclined at an angle of 60°, will fit the conical opening. Morever, the fact that the apparatus is constructed of metal is in itself a disadvantage. Only extraordinary care will keep the metal clean and bright in the atmosphere of a laboratory. The disadvantage could be largely overcome by nickel-plating the metallic box, but we have not seen this luxury introduced. In the filtration of liquids, giving rise to very acid fumes, the use of a metallic jacket is hardly admissible.

The second apparatus alluded to is that contrived by Dr. A. Horvath, and described in the *Annalen der Chemie und Pharmacie*, vol. clxxi., page 135, 1874. A tube of soft lead one centimetre thick is wound around a funnel in the form of a spiral, one end being con-

*Read before the New York Academy of Sciences, and published in the American Chemist.

nected by a tightly-fitting cork with a flask placed at a convenient distance, and the other end of the leaden pipe communicating with a recipient for the escaping vapours. Steam being generated into the flask, it passes through the leaden tube and warms the funnel and contents. This contrivance may work well, but it is not very convenient ; the inventor strangely enough adds that by employing ether, alcohol, carbon bisulphide, benzol, or anilin, in place of water, filtration can be carried on at any desired temperature. The question naturally arises why select liquids having such low boiling-points as ether (35·7°C.) and carbon bisulphide (46·6°C.) to effect *hot* filtrations ; surely the cases are rare where the temperature could not be moderated, if desired, by generating steam less rapidly. Then, too, the atmosphere of a laboratory, where a dozen or more solutions are warming by the uncondensed vapours of carbon bisulphide, would be anything but agreeable.

There seems to be room, then, for a simple, cleanly, portable, and inexpensive apparatus for keeping the contents of a funnel hot while filtrating, and it is believed that these requirements are filled by the new apparatus described in this paper.

The materials are found in any ordinary laboratory. Select a small funnel with a long stem, and a larger funnel with a wider throat, and cut the stem of the larger funnel short ; slip a piece of India-rubber tubing of the required size over the stem of the smaller funnel, and then insert it in the larger one so that it fits water-tight. The inner funnel should project about half a centimetre above the edge of the outer, and as much below the stem of the latter as it admits. We have found the three sizes named below sufficient for all operations of analytical chemistry.

Dimensions given in centimetres; the first figures gives the greatest diameter of the funnel, and the second its length including stem :—

	Outer Funnel.	Inner Funnel.
No. 1	7 × 6½	4 × 10
" 2	10½ × 9½	6½ × 12½
" 3	13½ × 13	10 × 17

Steam generated in a flask of about one litre capacity and conducted by means of a glass tube into water filling the space between the two funnels, warms the filter on the inner funnel with its contents. In one experiment the water in the outer funnel marked a temperature of 97°C., and the liquid in the former one 76°C. The temperature in the inner funnel may be greatly increased by covering it with a convex glass, or by employing a saline solution in the outer funnel.

As a matter of course, water condenses in the outer funnel, and must be removed from time to time. In the case of funnels No. 2 it accumulates at the rate of 30 to 35 c.c. in half an hour when boil-

ing vigorously. This seems at first sight to be an objection, but the superfluous water can be so readily removed with a pipette or a siphon that it does not have much force. Or the accumulating water may be drawn back into the steam generator through diminished pressure by simply removing the lamp beneath the flask. In this case, the end of the tube should plunge but little below the surface of the water in the outer funnel, else the latter will be completely emptied.

Actually the operator is not at all annoyed by the necessity of attending to this point, for the filtration requires his constant presence. Should the outer funnel be filled with distilled water in the outset, an overflow would not prove serious; since the inner funnel stands higher than the outer, any disturbance of the precipitate by accumulating water is out of the question.

The great compactness and cleanliness of this apparatus make it available in quantitative analysis, and we have used it for some time with great satisfaction. After washing a precipitate on the filter it may be dried very speedily by simply continuing the heat; the dried-filter removes easily, and so the two funnels once arranged need not be disconnected.

Other advantages will occur to those using the apparatus, such as the transparency of the outer vessel, the total absence of metal, and the increased rate of filtration consequent upon the higher temperature. The double funnel may be connected with a Bunsen water-pump or other apparatus for rapid filtration.

In washing precipitates with hot water we have also found it feasible to direct the steam from a small generator directly into the filter itself; if care be taken to moderate the pressure, the precipitate is washed with hot distilled water without danger of loss by spattering, and this works almost automatically.

DANGER OF THE MANUFACTURE OF PHOSPHORIC ACID.*

The *American Journal of Pharmacy*, for October, contains the following important notice:—

"In the preparation of phosphoric acid by the process recommended at the Boston meeting of the American Pharmaceutical Association, Dr. W. H. Pile, of this city, we regret to say, has been severely, though not dangerously, injured by the sudden explosion of the retort containing the phosphorus, nitric acid, and a little bromine. We, therefore, hasten to inform our readers of the danger connected with this process, and would suggest the utmost caution."

*From the Laboratory.

The directions for this process as reported in the *Druggist's Circular* for October, are as follows:

"Phosphorus..... 1 part.
Nitric acid, sp. gr. 1.42..... 6 parts.
Water ..... 1 part.
Bromine or hydrobromic acid, a sufficient quantity.

The phosphorus, water and nitric acid are introduced into a flask or stone jar of at least double the capacity of all the materials used, placing in the neck a glass funnel, and inverting a smaller funnel within the first one. Into the vessel containing the materials, add a few drops of bromine or hydrobromic acid, and as soon as the action has begun, place the apparatus into a vessel of water; let the action continue, taking care to prevent the funnels from becoming heated. The use of a very small proportion of iodine in connection with the bromine facilitates the action. The reaction is a steady one, and it always remains within the control of the operator."

It was claimed for this process that it was *safer* and more expeditious than that of the pharmacopœia.

Dr. Pile mixed in a glass retort 6 ounces of water and 36 ounces of nitric acid, of 1.42 sp. gr., and after placing the retort in the yard upon an empty barrel, added 6 ounces of phosphorus, and then poured slowly, through the neck of the retort, a fluid drachm of bromine, having a vessel with cold water ready, in which to place the retort as soon as the reaction should become brisk. The result was, before any brisk reaction could be observed, a most violent explosion, whereby the retort was shattered into atoms, the burning phosphorus sent flying in all directions, the barrel blown to pieces, and portions of it driven into the ground.

"It will be observed," says the editor of the *Am. Jour. of Pharmacy*, "that while on the one hand *a few drops* of bromine is a very uncertain quantity, on the other hand it is not stated that the bromine should be added drop by drop, waiting after each addition until the reaction has taken place,"

The action of bromine upon phosphorus has been long known to take place with explosive violence; and on account of this violence, the process appears to be too dangerous for general adoption, since a slight oversight in the addition of the bromine may entail most dangerous consequences.

The strength of the acid as originally given (6 of acid to 1 of water) is altogether too great; for even *without* the bromine, the action of acid of this degree of concentration is liable to become uncontrollable.

Elsner relates in the *Chemical News*, 1861, the account of a violent explosion in the course of the manufacture of phosphoric acid, by which the windows were blown out and the walls of the building shattered. Several of our manufacturing chemists have had accidents from the same cause, viz.: the use of too concentrated nitric acid.

The acid ought *never* to be much stronger than about equal parts acid and water, although it is claimed by Shuttleworth (*Canadian Pharmaceutical Journal*, 1871) that acid of S. G. 1.24 may be used with safety.

There appears to be no advantage in the use of bromine, iodine *alone* answering every purpose, and with much less danger of accident.

The water and the phosphorus should be placed in a flask, and the flask immersed in cold water; a few grains of iodine (20 to 25 grs. for each oz. of phosphorus used) are carefully added. The iodine combines with a portion of the phosphorus, producing a vermilion-red body. The nitric acid is then added. The apparatus is set in a fume closet or in the open air. The operation goes on quietly, and after eighteen to twenty hours the phosphorus is dissolved. The action is promoted by the addition of a small quantity of hydrochloric acid.

Since the accident, Prof. Markoe has modified his original formula, according to which "12 ounce each of water and nitric acid, sp. gr. 1.42, are mixed, then 4 cubic centimetres of bromine added, and shaken until it is dissolved; 10 grains of iodine are now added, and afterwards two ounces of phosphorus; the reaction commences at once, and at the end of an hour is sufficiently brisk to cause the escape of bromine vapors. The flask is now placed into cool water (of 55° F.), and without further precaution the reaction proceeds until the phosphorus is dissolved, which is accomplished in twenty-four hours."

We fail to see any real advantage of this process, even if rendered perfectly safe, over that originally proposed by Berzelius, viz.:—to dissolve phosphorus with the aid of a gentle heat in a mixture of one part acid and two parts water.

W. S. Thompson, in describing a modification of this process in the *Am. Journal of Pharmacy*, 1858, recommends the use of four troy ounces of phosphorus, nitric acid s. g. 1.42, 26 fl. ozs., water 52 fl. ozs. The acid, water and phosphorus are placed in a dish holding six quarts, and a *very gentle heat* applied. The process is completed in eight hours, and the product 98 fl. ozs., of s. g., 1.064.

Prof. Attfield proposed the use of a flask, with two funnels, as described in the process given by Prof. Markoe, which is undoubtedly a much better arrangement than that of the dish and funnel as suggested by Prof. Proctor, or the retort as required by the British Pharmacopœia.

At the present price of dilute phosphoric acid (25c. per lb.), no retail pharmacist in his senses would attempt to prepare it for his own use, except for experiment, by this or any other process, any more than he would undertake to manufacture sulphuric ether or sulphate of morphia, while on a large manufacturing scale there are other and more rapid and economical means of production than by

the use of nitric acid. Certainly no manutacturing chemist having a due regard for the rights of insurance companies or economy of production, operating on say ten pounds of phosphorus, would think of adding to the same nearly *two pounds of bromine* as called for by the modified formula.

To those of our readers who are disposed to *experiment* with phosphoric acid, we say, *omit the bromine;* but to those who do business for *profit*, we give the advice to *buy* dilute phosphoric acid rather than attempt the uncertain results obtained by operating upon such dangerous materials as phosphorus and nitric acid.

DOLOMITE AND MAGNESITE.*

Mr. Stoddart, in his paper on the Bristol Rocks at the Conference meeting last month, caused some astonishment by describing certain specimens of dolomite and magnesite which would not effervesce when sulphuric acid was applied. The subject is again referred to by Mr. H. O. Huskisson, who, writing to the *Pharmaceutical Journal*, expresses his belief that the anhydrous state of the mineral is the reason of the non-effervesence. Mr. Huskisson says he has worked on dolomite and magnesite some years—for the production of carbonic acid gas for the bicarbonating potash and soda, and can fully endorse Mr. Stoddard that they are not acted upon by sulphuric acid in any appreciable quantity in the cold, even when powdered; the slight action of sulphuric acid on powdered magnesite being due to the elevation of temperature caused by mixing the acid with water. He finds the best way to liberate the gas is to place a charge of magnesite, broken up in pieces about the size of walnuts, in the generator, add the sulphuric acid, and then heat the vessel to about the boiling point of water; in a few minutes the guage glass will show a pressure of gas of 10 to 15 lbs. After the sulphuric acid is saturated, run the liquor off and add fresh acid. The liquor, sulphate of magnesium, may be purified by filtration and crystallization.

Magnesite and dolomite are terms used in the trade to express the amount of carbonate of lime and magnesia present in the mineral. If over 50 per cent. of carbonate of magnesia, it is magnesite; if under that it is dolomite. The best magnesite comes from Athens, but it is very uncertain in its arrival, as it only pays to bring over as ballast; what is in the market now is Prussian.

* From the Chemist and Druggist.

GLYCYRRHIZIN, THE SWEET PRINCIPLE OF LICORICE.

At a meeting of the Societe de la Pharmacie, Paris, M. L. Roussin read on this subject a very interesting paper, which was reported in the *Pharm. Jour. and Trans.*, and from which we take the following extracts:

The author said that his attention had been drawn to the subject by the fact that glycyrrhizin, the so-called sweet principle of liquorice root, is insipid, compared with the root itself. Glycyrrhizin, purified by four solutions in alcohol, and four successive precipitations of foreign matters by ether, appeared, after the evaporation of the alcoholic-ethereal liquor, as a yellowish substance, insoluble in cold water, and nearly devoid of taste, only developing in the mouth after some time a sweetish sensation, recalling faintly the taste of liquorice root. It therefore seemed evident to the author that the substance hitherto called glycyrrhizin is not really the sweet principle of the liquorice root in the state in which it exists naturally in the root, where it is extremely sweet in taste and rapidly soluble in water.

It is mentioned in chemical treatises that alkalies give a yellow colour, both with glycyrrhizin and with infusions of the liquorice root, but it does not appear to have been noticed that the sweet taste is not developed in glycyrrhizin except when its solution is affected in alkalies. Dilute solutions of potash and soda determine the solution of glycyrrhizin very rapidly; the sweet taste being quickly developed, whilst the liquor takes a bright yellow colour. If the solution be evaporated in a water-bath it yields a scaly, translucid, deep orange residue, which re-dissolves rapidly in cold water, and possesses the peculiar sweet taste of liquorice. The employment of potash or soda is, however, attended by several disadvantages, especially, when added in excess, that of altering the glycyrrhizin and communicating to it a kind of soapy taste.

Glycyrrhizin does not exist naturally in liquorice root as a sodic or potassic compound. The saccharine matter contained naturally in the root is the result of a compound of glycyrrhizin with ammonia. This may be demonstrated by washing some previously bruised liquorice root, either fresh or dry, in a concentrated solution of potash or soda, when there is immediately developed a rather strong ammoniacal odor. The same reaction takes place with a pure extract obtained by exhausting the root in cold water and evaporating in a water-bath.

Glycyrrhizin forms with ammonia two compounds, one with excess of alkali, which yields a deep, yellow solution, the other containing half the proportion of the alkali, and giving an amber solution. The first compound is obtained by employing an excess of ammonia to dissolve the glycyrrhizin in water. The resulting deep

yellow solution evaporated to dryness, either at the ordinary temperature or in a boiling water-bath, leaves a shining, scaly, friable, non-hygroscopic residue, which is of a yellowish colour and constitutes the second ammoniacal compound; it re-dissolves readily in water, communicating to it an amber colour. The addition of a few drops of ammonia immediately turns the colour of this solution a deep yellow. The aqueous solution of the second ammoniacal compound reproduces very exactly the characteristic taste of liquorice root.

The author states that glycyrrhizin in these two compounds plays the part of a true acid, and that the compounds are true salts, which undergo double decomposition not only with nearly all the metallic salts, but also with the salts of the organic alkaloids. The precipitates formed contain glycyrrhizin in combination with the oxide or the alkaloid. Glycyrrhizin, or glycyrrhizic acid, appears to be an acid intermediate in its principal properties between tannic acid and pectic acid. The yellow combination formed by excess of ammonia is the basic glycyrrhizate of ammonia. The second, containing less ammonia, and which the author considers to represent the true sweet principle of liquorice root, is the glycyrrhizate of ammonia, or, as he proposes to call it, ammoniacal glycyrrhizin. 2.50 grams of ammoniacal glycyrrhizin were dissolved in a mixture of alcohol and ether previously acidulated by some drops of hydrochloric acid, and platinum perchloride added in slight excess. The chloroplatinate of ammonia collected at the end of forty-eight hours, washed and dried, weighed 0.0455 gram. Calcined, it yielded 0.0205 of platinum, corresponding to 0.0035 of ammonia. Consequently ammoniacal glycyrrhizin contains 14 per cent. of ammonia, and the equivalent of glycyrrhizin would be higher than it has been hitherto considered.

One gram of pure ammoniacal glycyrrhizin dissolved in a litre of water gives a solution which is very sweet. The same quantity dissolved in two litres of water gives a solution that is more agreeable to the taste, and resembles closely that of the liquorice root. If a very small portion of ammoniacal glycyrrhizin be placed upon the tongue it develops instantaneously a sweet taste, so strong as to be disagreeable to most persons.

The glycyrrhizin itself is nearly insoluble in water and insipid, and only acquires its sweet taste when in combination with an alkali, may be shown by taking a solution of 1 part of ammoniacal glycyrrhizin in 300 of water, which would be a very sweet liquor, and adding to it sufficient of any acid to saturate the ammonia and set free the glycyrrhizin. The liquor immediately loses its sweet taste, and after a time flocks of glycyrrhizin are precipitated. With more concentrated solutions (1 in 100 or 1 in 50), and acetic acid, the precipitate forms more slowly as a firm transparent jelly. This jelly has no taste, but if there has been no excess of acid used a

slight taste of liquorice is gradually developed in the mouth, due to the natural alkalinity of the saliva. A small quantity of ammonia re-dissolves the flocks and restores instantaneously the primitive taste.

The author considers that these facts explain simply several phenomena that have hitherto been obscure. Frequently liquorice is met with that has but little taste, especially when the drying of the root has been slow or incomplete, or when it has been kept in a damp place. This result he attributes to a commencement of fermentation by which acid products, and especially acetic acid, are generated. The ammonia of the ammoniacal glycyrrhizin is partially saturated, the insoluble glycyrrhizin being set free and the sapidity of the root proportionately diminished. If these roots be allowed to remain a sufficient time in a slightly ammoniacal atmosphere, they recover their original taste, and readily yield their sweet principle to water.

Those who have had occasion to prepare large quantities of extract of liquorice by exhausting the coarsely powdered root, will have remarked that the liquor, although limpid when first obtained, frequently becomes turbid in the course of a few hours, especially in summer; giving off carbonic acid, and depositing a voluminous gelatinous yellow precipitate. The liquor becomes strongly acid and loses the greater proportion of its sweet taste. The precipitate so formed, which is frequently separated and thrown away, is really the glycyrrhizin set free; it can be re-dissolved and the sweet taste restored to the liquor by the addition of a few drops of ammonia.

The extract obtained by evaporating the macerate of the liquorice root is very hygroscopic, and frequently can only be preserved in the solid form by being mixed with large quantities of inert substances: starch, gum, etc. In the heat of summer the cylinders of extracts will soften and run in spite of all precautions. Ammoniacal glycyrrhizin, on the other hand, has no hygroscopic tendency, and does not soften even at a temperature of 80° to 100°. It is therefore to foreign matters that the softening of the extract is to be attributed.

The author has found that sulphate of quinine, sulphate of magnesia, iodide of potassium, and ipecacuanha, lose most of their taste if mixed with a sufficiency of ammoniacal glycyrrhizin. It would appear that beside the chemical action the very persistent taste of the sugar of liquorice root renders the palate for some moments insensible or indifferent to other sensations. He considers that ammoniacal glycyrrhizin might frequently be advantageously mixed with pill masses, powders, or mixtures, it being more efficacious in masking the taste than one hundred times its weight of sugar. The taking of such medicines as cod-liver oil and syrup of iodide of iron, would be much facilitated by previously dissolving a very small quantity of it in the mouth.

Ammoniacal glycyrrhizin may be prepared industrially, without treatment by alcohol and ether. The bruised liquorice root is exhausted methodically by the smallest possible quantity of cold water, the liquor boiled and cleared from coagulated albumen, then precipitated after cooling by an excess of sulphuric or hydrochloric acid. The precipitate is collected and well washed, and then redissolved in ammonia water. This solution filtered and evaporated yields the ammoniacal glycyrrhizin in a friable varnish-like residue. Its taste resembles exactly the taste of the liquorice root, as by this treatment the acrid matter naturally present in the root is preserved, whilst it is almost entirely removed by treatment with alcohol and ether.

M. Baudrimont remarked, in confirmation of M. Roussin's statements, that he had noticed frequently that when the syrup of citric acid of the Codex was added to a mixture sweetened by liquorice, the mixture lost almost all its sweet taste.

M. Bussy noticed that as a consequence of these experiments it became evident that liquorice was unsuited for sweetening mixtures containing alkaloid in solution.

M. Mialhe remarked that the inability of diabetic patients to perceive the taste of liquorice was now explained by the fact that at the commencement of mastication their saliva was ordinarily acid.

SALICYLIC ACID.

In the *Archives fur Klinische Medicin*, Dr. C. E, Buss, of Basel, has a long article on the use of salicylic acid as an antipyretic. His conclusion is that it possesses remarkable power in this direction, rivaling that of quinine. He recommends the acid to be given in the evening, and but once daily. A perceptible fall of temperature regularly ensued. To reach an action equal to that of quinine, double the dose should be given. He advises, however, against doses over two scruples. It may be given in a powder, or a lozenge, with sugar. Care must be exercised that the dry powder does not cause vomiting.

In the *Berliner Klinische Wochenschrift*, Dr. Hanow gives his experience with salicyl in diphtheria. He claims to have had "astonishingly favorable results." He makes a weak solution of equal parts of the acid and phosphate of soda in water (about three grains of each to the ounce), and has the patient swallow, slowly, a tablespoonful of it every hour. "After the third or fourth dose, in every case, the false membrane was detached, and was thrown up so fast that it caused some choking. With the disappearance of the exudate, the fever diminished, and convalescence set in in twelve hours."—*Philadelphia Med. & Surg. Report.*

INCOMPATIBLES.*

BY B. F. JAMES.

Medicinal substances, which, when brought together cannot be made to accord, but give rise to changes by which compounds are formed which are inert or unsuitable for administration, are called *incompatible*.

Incompatibility may be of three kinds:—Chemical, Pharmaceutical, Therapeutical.

By chemical incompatibility is meant the condition assumed by substances when brought in contact, by which insoluble substances are produced, or other chemical changes take place, which have not been forseen or intended by the prescriber.

It was formerly supposed, if two or more substances were ordered in a mixture, where under the existing conditions they would form an insoluble compound, that such substances were incompatible. If, for example, some preparation of opium was ordered with a vegetable infusion containing tannic acid, it was considered improper to do so, as tannate of morphia is insoluble; but that this is an error will be at once obvious if it be remembered that many substances insoluble in water may be readily dissolved by the fluids of the stomach and the intestines, and readily absorbed in the circulation. Tannate of morphia and tannates of the other alkaloids are doubtless less readily absorbed than their more soluble salts, but such substances are far from inert, and under certain circumstances may be very effectual as therapeutic agents. Tannate of morphia will cause sleep, tannate of emetia will cause vomiting, and tannate of strychnia will cause all the medicinal and poisonous effects of that alkaloid,—except that they act less rapidly. Very many insoluble substances are used in medicine, as calomel, sub-nitrate of bismuth, reduced iron, &c.

The formation of an insoluble substance, therefore, as the result of a mixture of chemical bodies, while it shows *chemical* incompatibility, does not necessarily render the mixture improper for administration; on the contrary, it may be a condition which especially adapts it for the purposes for which it was prescribed, but in all such cases the effect of the insoluble substance must be understood by the physician beforehand, otherwise very different results may be produced from those which he intends; or, as in most cases, the medicine become practically useless.

For example, if compound infusion of roses be prescribed for its refrigerative effect as a draught, and a pill acetate of lead be given at the same time, for its astringent action, the effects of one or the other substance would be very much reduced, or perhaps, both be

*From the Laboratory.

completely neutralized, for the sulphuric acid of the infusion would form an insoluble substance with the lead of the pill—sulphate of lead—which is not capable of being absorbed in appreciable quantities.

Insolubility is not always the result of the mixture of substances which are chemically incompatible. For example, solutions of the alkalies, even if very dilute, have the effect of so acting upon the active principles of stramonium, henbane and belladonna, that after a few hours contact, the activity of the latter substances is totally destroyed.

Again, ammonia and acetic acid, used separately for external application, act as rubefacients, but mixed form acetate of ammonium a neutral salt, having no such action.

Permanganate of potassium, chromic acid and nitrate of silver each act as a caustic, but mixed with organic substance, oils, glycerine, &c., they are decomposed, and their escharotic effects prevented.

The mixture of substances which are chemically incompatible may give rise to explosion or combustion, and thus cause serious accidents; the cases where such changes occur are, however, not common.

Mixtures of creasote or other organic substances with oxide of silver are of this description; spontaneous combustion in such mixtures is not unfrequently the result.

Pharmaceutical incompatibility is applied to substances which are physically incapable of being mixed or where unsightly or inelegant preparations are the result. Thus, if nitrous ether be added to tincture of guaiacum a gelatinous mass will be produced.

The same takes place where mucilage of acacia is added to solutions containing alcohol, or if resinous tinctures be added to aqueous solutions the resin will separate.

Infusions or other preparations containing tannin form with iron preparations, inky solutions. Fatty oils are pharmaceutically incompatible with aqueous solutions, become so by the acid of certain substances, as mucilage of acacia, albumen &c., forming what is called an emulsion.

By therapeutic incompatibility is meant the combination of such substances as possess opposite physiological properties—as the calabar bean and belladonna; cantharides and bromide of potassium; camphor and aconite.

No arbitrary rules are of much service in regard to incompatibles—a practical acquaintance with the properties and combinations of substances being the only sure guide against error in this direction.

The following may, however, be of some assistance:

I. Alkalies precipitate the metallic oxides from salts of the heavy metals; also the alkaloids, in some cases dissolving them if added in excess, but most frequently leaving them in an insoluble condition.

II. Salts containing volatile acids, as carbonates, acetates, cyanides, &c., are decomposed by strong acids, a salt of the stronger acid being produced.

III. Metallic oxides in contact with acids combine to form salts which may be soluble or insoluble according to the acid employed.

IV. Vegetable astringents precipitate gelatine, albumen, the alkaloids and many metallic salts.

V. Alcoholic solutions precipitate solutions containing gum, and metallic salts insoluble in alcohol.

VI. Aqueous solutions precipitate tinctures containing substances insoluble in water. Many special cases of incompatibility might be given, but these are best learned by practical experience.

THE PROPORTION OF MORPHIA IN WINSLOW'S SOOTHING SYRUP.*

BY J. H. SALLS, P. C.

One fluid ounce of the syrup (the quantity taken each time) was very slightly acidulated with sulphuric acid and washed with chloroform, then rendered alkaline by ammonia and shaken with a larger bulk of chloroform, set aside and the chloroform layer removed and evaporated. The residue, in the first operation, weighed 18 milligrams. In a second operation, after extracting with chloroform as before, the alkaline solution was extracted with amylic alcohol; the chloroform giving a residue of 17·4 milligrams and the amylic alcohol giving 1·4 milligrams, making a total of 18·8 milligrams. In a third operation, the alkaline solution (previously washed with chloroform while acid) was three times exhausted with chloroform, and then extracted with amylic alcohol, when the residue of all the chloroform weighed 19·1 milligrams, and the amylic alcohol left no appreciable residue. Hence it appeared that the use of amylic alcohol, the solvent preferred for morphia by Dragendorff† is not indispensable if sufficient chloroform be used. In another operation, the chloroform solution of alkaloid obtained as previously was extracted with water, accidulated by sulphuric acid, and the aqueous sulphate titrated with Mayer's volumetric solution, when 1·2 cub. cent. of this solution were required to complete the precipitate. Each cub. cent. precipitating 0·020 of morphia, 24 milligrams of alkaloid were indicated.

The traces of other opium alkaloids could not appreciably vary the results, which are only presented as pretty nearly approximate. The volumetric method was less satisfactory than the others. Tak-

*American Journal of Pharmacy, Nov. 1875.

† "Werthbestimmung Starkwirkender Droguen." 85.

ing the mean of the other three results we have $(18+1^{\circ}\cdot4+19.1)\div3$ =18·5 milligrams, or 0·28 grains alkaloid; from the fluid ounce of syrup. The qualitive reaction for morphia were obtained from the residue with iodic acid and starch, with nitric acid (followed by stannous chloride), with ferric chloride, platinic chloride, sulphomolybdic aeid, tannic acid, and with sugar and sulphuric acid.

ANTHELMINTIC PROPERTIES OF PUMPKIN SEED.

The *Lancet* states that some investigations have recently been made by M. Heckel respecting the active part of pumpkin seeds. These seeds have been much used of late for the expulsion of the tapeworm, for which purpose they were employed in the early part of the last century. The mode of their administration has hitherto been to give the bruised seeds in large quantities suspended in water, the outer envelope only having been removed. About two ounces of the seed was the ordinary dose. It is probable that so large a quantity contains much inert matter. Some recent observations apparently indicate that the active principle is contained only in the embryo. To ascertain whether this is the case was the chief object of M. Heckel's observation. He first administered, in two cases of tænia, about six ounces of the perisperm, tegumentum and testa, a purgative of castor oil having first been administered. The tapeworm was not expelled in any case. In two other cases the membrane surrounding the embryo was given—about half an ounce, —preceded and followed by a dose of castor oil. In each case the tapeworm was expelled entire. Subsequent experiments yielded the same result. This membrane was then carefully examined, and found to consist of two membranes separable by maceration in water. The outer membrane contained a resin in small quantities (one in seventeen), which M. Heckel believes to be the active agent. He believes that the castor oil acts not only by its purgative effect, but by dissolving the resin and rendering it active. The second membrane contained more chlorophyll than resin. It must not be forgotten that these seeds contain a fixed oil, to which their qualities have been ascribed, and which may be obtained by cold expression from the seed in the proportion of half an ounce to a pound. This oil has been used with success, in repeated half-ounce doses, in cases of tænia.

FORMULÆ USEFUL FOR INCREASING AND REDUCING THE STRENGTH OF LIQUIDS TO A DESIRED DEGREE.*

BY EDO CLAASSEN.

I. We have on hand a liquid, the weight and percentage of which we know. We want to mix it with so much of a liquid of the same kind, but of a higher or a lower percentage, or with so much water that the mixture will exactly have the desired percentage.

If we call

a—the quantity of the liquid on hand, of known percentage;

b—its percentage;

c—the percentage of the liquid to be mixed with *a*;

d—the desired percentage of the mixture;

x—the quantity of the liquid to be mixed with *a* of higher or lower percentage, or the quantity of water, we have

1) $x = \frac{a(b-d)}{d-c}$, if a liquid of the same kind, but of higher or lower percentage must be added; or, in words:

To find *x*, the quantity of the liquid to be added of higher or lower percentage, multiply the difference between the percentage of the liquid *a* and the desired percentage of the mixture by the quantity of the liquid *a*, and divide the product by the difference between the desired percentage and that of the liquid to be mixed with *a*;

2. $x = \frac{a(b-d)}{d}$, if water must be added; or, in words:

To find *x*, the quantity of water, proceed as described sub. 1, but divide the product by the desired percentage only.

II. We have to prepare a liquid of desired weight and percentage, and have on hand a liquid of the same kind of higher and another of lower percentage (=a stronger and a weaker liquid), or instead of the last one, water.

If we call

a—the quantity of the mixture;

d—its percentage;

b—the percentage of the stronger liquid;

c—the percentage of the weaker liquid;

x—the quantity of the weaker liquid, or of water, we have:

1. $x = \frac{a(b-d)}{b-c}$, if a stronger liquid must be mixed with a weaker one; or, in words:

To *x*, the quantity of the weaker liquid to be added, multiply

*American Journal of Pharmacy, Nov. 1875.

the difference between the percentage of the stronger liquid and the desired percentage of the mixture by the quantity of the mixture, and divide the product by the differerence between the percentage of the stronger and that of the weaker liquid.

2. $x = \frac{a(b-d}{b}$, if a stronger liquid must be mixed with water;

or, in words:

To find *x*, the quantity of water, proceed as described sub. 1, but divide the product by the percentage of the stronger liquid only.

ADVANTAGES OF CHLORAL HYDRATE AS A PRESERVATIVE.*

Dr. W. W. Keen, of Philadelphia, published in the *Medical Times*, more than a year ago, the results of experiments with chloral hydrate as a preservative, establishing its high value for that purpose. After a year's additional experience, he reports to the *American Journal of the Medical Sciences* for July, a full confirmation of the estimate formerly placed on the agent. His conclusions may be summed up as follows:

1. One pound of chloral is used to three or four gallons of water. A damaged or inferior article, costing $1.00 a pound may be employed, making the cost of injecting the subject from 25 to 50 cents. It is therefore the cheapest preservative in use.

2. It preserves all the tissues moist and in a natural condition as to consistence and color.

3. The finer vessels are perfectly injected.

4. There is no odor imparted to the hands on dissection, not even of the abdominal viscera.

5. Instruments and clothing are not in the least affected.

6. Insects are almost invariably repelled.

7. Permanent preparations are made with facility, and are not affected by heat, moisture, or insects.

8. Objects for microscopical examination, and morbid specimens, &c., can be perfectly preserved by it.

9. It furnishes the best means for embalming.

10. It preserves solutions of sulphate of morphia, strychnia, &c., for hypodermic injection, five grains of chloral being added to each ounce.

11. It preserves pus, sputa, urine, and other fluids for future examination, without affecting their chemical or physical properties.

12. It is valuable as a deodorizer and antiseptic to fetid ulcers and tumors; also as an injection in vaginitis, gonorrhœa, and for many other surgical purposes.

* Pacific Medical and Surgical Journal:

THE DETECTION OF TARRY MATTERS IN COMMERCIAL AMMONIA.

BY M. KUPFERSCHLÆGER.*

The action of nitric acid on sulphate of aniline has been so often described that it may be considered well known; what is but little known respecting it is its capability of being employed for determining the purity of caustic ammonia. Many works on analytical chemistry state that the most certain method of discovering the presence of colourless tarry matters in ammonia consists in pouring an excess of the latter into a ferric solution, and leaving the mixture until the precipitate has subsided and left the supernatant liquid clear; then treating the liquid, after filtration, with ammonium sulphydrate. If a brown colour or black precipitate, due to ferrous sulphide, be produced, the ammonia contains tar products. This long and complicated process by no means necessarily indicates the nature of the impurities, however. We therefore prefer to obtain the colouration which nitric acid produces with the aniline and toluidine almost invariably present in ammonia obtained from gas liquor; the least trace of these bodies produces a red colouration. The *modus operandi* is as follows:—The ammonia is cautiously added to some cubic centimetres of a mixture of colourless nitric acid, with a fourth of its volume of water contained in a test tube. If tarry matters be present the red colour appears at once, and becomes brown in proportion to the amount of impure ammonia added. Further, the mixture heats considerably, and exhales the odor of tar, especially if the addition of ammonia be stopped as soon as the action ceases to be energetic. The brown colour persists indefinitely.

Tarry ammonia does not completely precipitate metallic oxides, and should not be used for the preparation of certain re-agents, notably the nitric molybdate of ammonia, to which it imparts a brown colour.

ACTIVE PRINCIPLE OF ERGOT.

Buchheim found the extractum secalis cornuti of the German pharmacopœia very acid from lactic acid, which appears to be produced from mycose. The extract was treated with lime, the filtrate precipitated with subacetate of lead, the excess of lead removed by carbonate of ammonium and the filtrate evaporated. The syrupy residue separated crystals of leucin in the course of one day; tyrosin

* Journ. de Pharm, et de Chimie, August, 1875, p. 104, from the Bulletin de la Societe Chimique. Translated in the Chemist and Druggist.

was not found. The filtrate was treated with lime to expel ammonia and with oxalic acid to remove lime, then evaporated, dissolved in diluted alcohol and precipitated by ether. This precipitate had the specific action upon the webfoot of the frog, noticed by Wernich, but still contained leucin and inorganic compounds. It resembles glue in appearance, but is deliquescent and does not gelatinize. Wiggers already likened ergotin to osmazom (a term formerly applied to the portion of extract of meat soluble in diluted alcohol.)—*Zeitschr. d. Oesterr. Apoth. Ver. No. 24, from Corr. f. Med. Wissench in Am. Jour. Pharm.*

SURE CURES FOR RHEUMATISM.

Those afflicted with rheumatism—and in Canada their name is legion—will be pleased to have a few tried and well recommended remedies from which to choose. These are kindly furnished by the *Journal of Health*, and we have no doubt that if any of our readers will go through the list, he will be thoroughly settled in his opinion regarding the efficacy of medicine. It would be too cruel to say that he will also have his rheumatism as well, but there is, nevertheless, a strong possibility that such might be the case.

Rochelle salts. Guaiacum. Rub with chloroform liniment. Sleep with your head towards the north. Nux vomica. Wear a chest-protector. Nitrate of potash. Nitrate of sodium. Fowler's solution of arsenic. Sleep with a big dog, and give it to him. Kill a big dog, and after taking out his intestines, put your feet where they came from. Magnetism. Galvanism. Bromide of ammonium. Iodide of ammonium. Mustard plasters. Spanish-fly plasters. Bromide of potassium. Iodide of potassium. Lemon juice. Sage tea. Wear sulphur in your shoes. Hard rubbing. Oleate of mercury. Common soda. Capsicum. Radway's Ready Relief. Wear silk. Wear flannel. Wear buckskin. Gin and hemlock. Reynold's specific. Make a necklace of the knots produced by the sting of an insect on "Golden Rod" and wear it next the skin. Citrate of lithia. Exercise and keep it off. Keep as quiet as possible. Colchicum. Morphine. Water cures. Angel's rheumatic gum. Pray fervently. Soft soap bandaged with flannel. Do not eat meat. Do not eat eggs or potatoes. Eat anything you please. Opium. Do not smoke at all. Smoke all you like. Take camphor. Drink nothing but beer. Do not drink anything but whisky. Do not drink anything at all. Do not leave the house. Take a ride out whenever you can. Carry a piece of alum in your pocket. Take Turkish baths. The Turkish bath is one of the worst things for Rheumatism. De Soto spring water. Acetate of potash. Burdock seed. Bathe in hot water with pearl-ash in it. Bathe in cold

water frequently. Do not bathe at all until you are nearly well. Catnip tea. Wrap fresh lamb's entrails around your neck. Drink brandy. Brandy is very bad for rheumatism. Sleep next to flannel. Go to Arkansas Hot Springs. Go to Doolittle springs—to Saratoga, to Florida, to Bermuda, to the Sandwich Islands, to California, to the South of France, to Mexico, to the Azores, to South America. Wear a horse chestnut in your left hand breeches pocket. Wear a potato in the other. Take Constitution water. Take carbolic acid. Wrap joints with cotton, and cover with oiled silk. Glen Flora water. Get out on the prairies. High land is best for rheumatism. Balm of Life. Magnetic Salve. Rub with kerosene. Mustang Liniment. Read Job. Put on hot poultices. Apply hop mashes. Do not swear. Put mustard plasters over the heart. Drink Friedreichall bitter water. Seidlitz powders. Take a quart of alcohol with a dozen lemons in it. Take spirits of turpentine. Rub with spirits of turpentine. Slippery elm poultice. Electric oil.

OCCURRENCE OF ETHYLIC ALCOHOL AND ETHER IN VEGETABLES.

Dr. H. Gutzeit draws attention to the fact, that this alcohol or its ethers have not yet been observed with certainty in the vegetable kingdom, while derivatives of methylic alchohol have been discovered in Mercurialis annua, Sorbus aucuparia, Cratægus oxyacantha, Pyrus communis, Chenopodium olidum, Beta vulgaris, Gaultheria procumbens, Monotropa hypopitys, ergot, also in coffee, tea, colanuts and guarana (methyl-theobromina), &c. The author examined the fruit of Heracleum giganteum hort., and found both ethylic and methylic alcohol in the aqueous distillates of the unripe and ripe fruits, ethylic alcohol predominating in the former and methylic alcohol in the latter; the volatile oil of the fruit contained ethylic butyrate. The aqueous distillate of the fruit of Pastinaca sativa L. contained ethylic alcohol, but none of its ethers could be found in the volatile oil. The unripe fruit of Anthriscus cerefolium, Hoffm., contains an ethyl-compound, the ripe fruit has no odor and contains no volatile oil—*Zeitschr. d. Oesterr. Apoth. Ver.* 1875, *No.* 21 *in Am. Jour. Pharm.*

EXPERIMENTS WITH PILLS OF PHOSPHORUS COMBINED WITH CERTAIN EXCIPIENTS.*

BY CHARLES G. FROWERT, M.D.

SERIES I.

Experiments with phosphorous pills, combined with the excipient *balsam of tolu*, one-twentieth grain in each pill, (No. 4 of pill series in preceding paper.)

Experiment 1.—Two pills were taken one hour after a hearty meal, by adult male, in good health. Examination of fæces ten hours afterwards, revealed the pills as entire as when swallowed, but somewhat softer.

Experiment 2.—Another subject swallowed one pill half an hour after a hearty meal. The pill was recovered eighteen hours afterwards in the fæces,—hard, and as a nucleus, about which was gathered fæces one-sixteenth of an inch in thickness.

SERIES II.

Experiments with phosphorus pills, combined with the excipient *silica*, one-sixtieth grain phosphorus in each pill, (No. 2 of preceding pill series.)

Experiment 1.—Three pills were taken by the same party, and under the same circumstances as in experiment 1, of tolu series.

Examination of fæces eight, twenty and thirty-two hours thereafter revealed no trace of the pills in that form.

Experiment 2.—Two pills were taken by patient, who was subservient to science in experiment 2, of tolu series, under same condition.

No traces of pills in fæces in three succeeding evacuations.

SERIES III.

Experiments with pills of phosphorous, combined with the excipient *cacao butter*, one-twentieth grain in each pill, (No. 1 pill series.)

Experiment 1.—Same subject as in preceding experiments, and under same circumstances. Two pills were taken. In half an hour breath heavy with odor of phosphorous.

In fourteen hours fæces were examined; failed to find any vestige of the pills.

Experiment 2.—Patient No. 2 swallowed two pills, one hour after hearty meal. Odor detected in breath in quarter of an hour. Could find no traces of the pills in fæces in succeeding discharges.

These experiments were conducted with great care, and under favorable circumstances, and go to show the relative value of the excipients, balsam tolu, silica, and cacao butter.

* Read at the meeting of the Phila. College of Pharmacy and published in the American Journal of Pharmacy.

Editorial.

LEGAL DECISION RESPECTING MEMBERS IN ARREAR.

A decision of considerable interest to the members of the Society was lately rendered in the case of the Ontario College of Pharmacy *vs.* N. C. Wallace, of Woodbridge. The action was instituted by the Registrar, at the instigation of the Council, and was for the recovery of three years' fees due by defendant. Although the Registrar has frequently been compelled to commence proceedings against those in arrears, none of the suits have, with this exception, been brought into Court. In the great majority of instances the default has originated in forgetfulness, and the energetic reminder of the solicitors of the College has always proved effectual in bringing the matter to an issue.

The case referred to was, however, of a different character. Not only did the defendant allow the case to go up for trial, but on a decision being twice rendered in favor of the College—in June and September last—desired to test the case still further, and consequently his legal adviser gave notice for a non-suit, or new trial, which was heard before His Honor Judge Boyd, in Chambers, on the 15th of November. As will be found by a perusal of the following letter from the Solicitors of the College, the judgment of former hearings was confirmed.

TORONTO, Nov. 16, 1875.

Ont. College of Pharmacy, }
Re Wallace. }

GEO. HODGETTS, Esq.,
Registrar Ont. Coll. Pharmacy,
Toronto.

DEAR SIR,—His Honor Judge Boyd, has given his decision herein, on the application of the defendant for a non-suit, or new trial, confirming the judgment for $6.75 for the plaintiffs previously given.

In giving his judgment he held that when a person once pays his fees and is registered under the Act, so long as he continues in the business, he can be sued for his annual fees, but if he has never paid any fees or been registered and is in the business, you cannot sue him under the Act for his fees, but that your only remedy against him would be for the penalty imposed by the Act for selling any of the drugs therein enumerated.

He also held that payment by one member of a firm was not sufficient to entitle all to be registered for the same fees or to carry on the business.

Yours truly,

MOWAT, MACLENNAN & DOWNEY.

It is to be hoped that as this is the first case which has been taken into court, it will also be the last. The defendant was very persistent in his endeavors to test the law to the utmost, and since the action was once commenced, we must say that we are glad that it was so disposed, and that the matter was so thoroughly sifted, as it will no doubt prevent further attempts at resisting a demand which few will deny is founded in moderation and justice.

A WORD TO THOSE INTENDING TO GO UP FOR EXAMINATION.

There appears to be some unaccountable misapprehension as to the intent of the resolution of the College under which aid is extended to those pursuing a course of pharmaceutical study, and from this cause arises much disappointment and trouble. Under such circumstances it may be well to point out the conditions which must be fulfilled ere applicants can claim any portion of the pecuniary grant.

In the first place, it is necessary for the applicant to have been apprenticed for two years to a regular pharmaceutical chemist, and evidence of this fact must of course be presented to the Registrar. He must also have been a registered Associate previous to the time of attending lectures. In addition to this, the applicant must attend the regular lectures provided by the College of Technology, now the School of Practical Science. These conditions being fulfilled, a sum of one dollar per week may be claimed for the time during which lectures have been attended, but this aid will not be extended to the same person for more than one session.

Previous to last examination, a number of young men, but few of them registered associates, attended private instructions on some of the subjects specified. Many of them thought to take advantage of the grant, and to this end applied to the Registrar, who laid the matter before the Council, from which it was referred to the Committee on Education. A meeting of this committee was held on November 9, when it was resolved, "That unless the conditions of the resolution granting aid to associates are, in all respects, fulfilled, applications cannot be entertained."

For the Council to aid those whose object is more to evade than to pass the examination would be indeed preposterous enough, and students may rest assured that the superficial knowledge gained during two or more months' forcing in a pharmaceutical hotbed, will be but a delusive support in the day of trial. Even if the sickly plants survive the day of transplantation, they will not grow but will quickly fade and wither.

We would commend to students the following remarks, taken from the last opening address at the School of Pharmacy, carried on under the auspices of the Pharmaceutical Society of Great Britain. Speaking of the manner of preparing for examination Mr. Ekin says:

"Your success here will much depend upon the way you look at your examinations, whether you regard them as mere sign-posts by the way or as your ultimate goal. Nothing can be more fatal than the latter view. To strain every nerve, simply to pass, only to leave yourselves exhausted and unfit for further exertion! To gorge the mind, regardless of the fact that the mind surfeited with an ill-digested load of material, which it makes all haste to free itself from, conceives, it may be, for ever after an absolute distaste for wholesome nourishment! These be the reasons of the dyspeptic wails that from time to time find utterance in the correspondence columns of the Journal. The man who by dint of cram lands himself by one supreme effort on the other side of the "Major" finds to his dismay that the mere qualification and title which he set such store by avail him nothing, and that the habits and love of study, which he might have but has not acquired, would have set him on his way in life with every certainty of success. As with the body so with the mind, it is the moderate and daily portion of food, well assimilated, that stands us in good stead. It is of prime importance that you should think before you read, or at least whilst you are reading, and only so will you be able to grasp your subject. 'Read, not to believe and take for granted, but to weigh and consider.' Bacon tells us, 'Studies serve for delight, for ornament, and for ability,' and much as 'ability and judgment in the disposition of business' concern us, I verily believe that it is in the 'delight' chiefly we reap our abundant reward."

Editorial Summary.

COTO BARK, A NEW REMEDY FOR DIARRHŒA, RHEUMATISM AND GOUT.—An account of this new drug is given in the *Archiv der Pharmacie* and reproduced in the *Pharm. Jour. & Trans.* We learn that, in 1874, Dr. G. C. Wittstein received from a Hamburg drug house, about five pounds of the bark, which had been sent from the so-called missions, in the interior of Bolivia, where it was held in great repute as a remedy against diarrhœa, colic, neuralgic tooth-ache, rheumatism and gout. A chemical invesigation was under-taken by Dr. Wittstein; Dr. Von Gietl made numerous clinical experiments, while Prof. Harz made a pharmacognostical and anatomical examination of the bark. From the details of these we gather the following particulars and conclusions: As neither leaves, flowers, or fruit were received the botanical orgin of the bark could not be determined, but certain indications point to a Lauraceous or Terebinthinaceous source. The bark occurs in flat or curved pieces, 12 to 18 inches long and about one-third or one-half inch thick; color, cinnamon brown; odor, aromatic, recalling cardamoms, camphor, cajeput oil, and, to a less degree, cinnamon; taste aromatic and pungent, slightly bitter, neither mucilaginous or astringent. The principal constituents of coto are: A pale yellow essential oil, lighter than water, and of peppermint-like taste; a volatile alkaloid of a herring or urine-like odor, resembling propylamine; a soft, aromatic and pungent resin, remaining viscous even after several weeks exposure, soluble in ether, chloroform and alcohol, difficulty soluble in benzol, insoluble in carbon bisulphide—constitutes about one seventh of the entire weight of the bark; a dark, hard and brittle resin, without smell or taste, soluble in alcohol, insoluble in ether, benzol, carbon bisulphide and chloroform, readily soluble in alkaline solutions from which it may be precipitated by acids—constitutes about one-tenth of the entire weight of the bark. The other con-stituents of the bark, generally occurring in small quantities, and not important to the medicinal use of the bark, are starch, gum, sugar oxalic acid (as a lime salt), tannin (green with iron), formic acid, butyric acid, and acetic acid. As only the essential oil and the soft resin are soluble in ether, and not the hard resin or the alkaloidal sub-stance, whilst all four of them are taken up by alcohol, Dr. Wittstein considers an alcoholic tincture of the bark to be the most suitable pharmaceutical preparation, in the proportion of about one part of coarsely powdered bark to nine parts of rectified spirit. The testing of the bark for mineral substances revealed nothing unusual. The bark left upon incineration 1·18 per cent. of ash, about three-fourths by weight of which consisted of carbonate of lime; besides which it

contained potash, soda, magnesia, alumina, iron oxide, manganese, sulphuric acid, phosphoric acid, silicic acid, and chlorine. The clinical experiments were made by Dr. von Gietl, in the General Hospital at Munich, upon sixteen patients (fifteen males and one female) suffering from different forms of diarrhœa. The drug was administered in two forms, as a fine powder and as an alcoholic tincture (1 in 10). The powder was given (in 0·5 gram doses four to six times a day) in eight cases; the tincture (10 minims every two hours) in seven cases; and both the powder and tincture in one case. In one case the use of the powder was not tolerated, it causing strong burning in the stomach and subsequent vomiting, and the same result followed the use of the tincture. The patient was phthisical. In another case also the powder was not tolerated, whilst the tincture caused no complaint. This patient was also phthisical. Professor Gietl considers that the results of the cases, details of which are given in the original paper, prove that in the new bark, we possess a *specific against diarrhœa* in the most diverse modification. No experiments appear to have been made to test the reputation of Coto bark in the treatment of rheumatism and gout.

Damiana.—There is little new to report in regard to this new drug. It appears that the leaves are coming into the New York market, but a new difficulty has arisen as to what constitutes the true damiana. At a meeting of the Alumni Association of the Philadelphia College of Pharmacy, Mr. Wellcome read a paper on the subject, and presented specimens of the leaves obtained from three different sources—Washington, San Francisco, and New York—but it was evident that all three specimens belonged to different plants. Leaves of the first are smooth, broadly lanceolate, dentate, having six teeth on each side; heavy midrib and ribs extending to the point of the leaf, which is from two to five lines broad, and six to twelve long, taste recalling mint. The San Francisco leaf, said to be obtained in Mexico, is obovate, deeply toothed, three to four teeth on each side, surface covered with short white hairs; taste resembling sage. The New York specimens are lanceolate, three teeth on each side, terminating in hard sharp points; distinct midrib, but indistinctly veined; leaf quite thick, with rough surface, with occasional black dots and shining scales.

Marking Ink Nuts.—A writer in the *Pharm. Journ. and Trans.*, in describing the drugs in the Indian Museum at South Kensington, speaks of the flat, black fruit of the *Semecarpus anacardium*, (Anacardiaceæ), which are often found in parcels of myra-

bolans, and the juice of which is used as marking ink. These nuts contain between the inner and outer layer of the shell or pericarp, a remarkably caustic blackish oily fluid which is apt to blister or greatly inflame the lips of those who attempt to crack the nuts. In persons of erysipelatous tendency the inflammation is often considerable, and even dangerous. This acrid oily liquid forms an excellent marking ink, which when first used writes brown, but afterwards becomes black. The writing may be turned black at once by the addition of ammonia. Possibly the sap of the tree might answer the same purpose for marking ink, and could be obtained more easily and in larger quantity. Liquor plumbi is said to be the best application to allay the irritation caused by the juice of the nut, but a strong decoction of teak wood, or of *Lobelia inflata* is worthy of trial. The latter plant is said to allay the irritation caused by *Rhus toxicodendron*, a plant of the same family as the Cashew nut.

Nature of the Deposits Formed in the Fluid Extracts of Cinchona, Ergot, and Hyoscyamus, U.S.P.—Mr. C. S. Johnson (*Am. Jour. Pharm.* vol. xlvii. p. 483), examined the washed deposit from fluid extract of cinchona, and found it to be of a bitter and astringent taste, and to be composed largely of cellular material. A solution obtained by acidulated dilute alcohol gave abundant general reactions for alkaloids. Alkaloids equal to 2½ per cent. were found to be present; amongst others quinia and cinchonia. The deposit from fluid extract of Ergot proved to be of an oily nature. An aqueous solution gave a yellowish-white precipitate with lead acetate, but no definite results as to alkaloids were reached. The deposit from fluid extract of hyoscyamus had the appearance of soft tar, and yielded by distillation, a considerable quantity of empyreumatic oil. The ash from the deposit was rich in potassium nitrate. No alkaloid could be found.

Preservation of Hydrocyanic Acid.—In a former number of this journal we called attention to a paper read by Mr. John Williams, at the meeting of the British Pharmaceutical Conference of 1874. From experiments then detailed it was concluded that glycerine might with advantage be employed for the preservation of hydrocyanic acid, and that about 20 per cent. of glycerine was about the best proportion which could be used. Mr. Williams has continued his investigations, and again presented a paper on this subject: from which we learn that, after the lapse of a year, samples of acid of a strength of 2 and 4·5 per cent remain unchanged. German glycerine was not found to answer so well as that manu-

factured by Price. With the former a yellow colour was developed, but acid preserved with the latter remained colorless. Experiments are being made in order to determine whether strong acid, say of 32 per cent., can be preserved by this means.

Solubility of Oil of Bitter Almonds in Water.—Fluckiger points out the fact (*Archiv der Pharmacie*) that neither ordinary oil of bitter almonds, nor that deprived of prussic acid, dissolves in water to the extent—1 in 30—generally stated in chemical handbooks. With 300 parts of water there is still a slight turbidity, and it is difficult to determine the exact point of saturation. The author thinks that the statement, 1 in 30, may have had its origin in a printer's error, and that 1 in 300 was intended. At any rate, the latter proportion is nearer the truth.

Jaborandi an Old Remedy.—There is a possibility that our new diaphoretic may not after all turn out to be a drug of very recent introduction. The *British Medical Journal* has been instrumental in throwing some little doubt on the matter by discovering in the works of the Honorable Robert Boyle a reference to Piso's *Travels in South America*, in which an infusion of the root of *jaborand* is mentioned as being very valuable as an alexipharmic. "I saw divers," says he, "as it were in an instant redeemed from death, who had been poisoned by the eating of poisonous mushrooms, and other unwholesome things, only by drinking a recent infusion of the root of jaborand."

Crayons of Sulphate of Copper.—The method of Steffen for preparing these fused sticks, described in this Journal, vol. ix. p. 69, has been tried by K. Calmberg (*Archiv. d. Pharm.*), but has not been found practicable. The author calls attention to a process proposed by him some years ago, and which is stated to be satisfactory. Four parts of sulphate of copper and one of borax are triturated together in a warm mortar. The liberation of water of crystallization gives the requisite plasticity, but if the mass is too dry a few drops of water may be added. The compound may then be rolled into sticks.

New Source of Picric Acid.—Dr. G. C. Wittstein proposes as a profitable source of this acid the acaroid resin or yellow resin

of Botany Bay. This product is derived from a native Australian plant, *Xanthorrhœa arborea*, and can be obtained at a low price. The resin is treated with dilute nitric acid, and digested at a gentle heat. On cooling, the acid crystallizes out. The yield is about 50 per cent.

THIRD ALKALOID IN HYDRASTIS CANADENSIS.—Mr. J. C. Burt (*Am. Jour. Pharm.*) reports experiments confirmatory of the existence of a third alkaloid in hydrastis, as pointed out by Mr. Hall (*Am. Jour. Pharm.*, xlv. 247, and this Journal, vol. iv. 442): a number of reactions are given by the author. The sulphate crystallizes in radiate clusters of prismatic needles, which are colorless. The alkaloid is present in smaller proportion than either berberina or hydrastia.

ELIXIR OF BEEF AND IRON.—A correspondent, "Blue Pill," sends the following formula. Liebig's ext. meat, 1 oz.; boiling water, 2 oz.; dissolve. Pyrophosphate of iron, 2 oz.; boiling water, 4 oz.; dissolve. White sugar, 2 oz.; sherry, one pint; dissolve. Mix the three solutions together. Dose—a fluid drachm three times a day.

Students' Department.

Answers to the following questions must be sent in so as to be received by the editor before the twentieth of each month. Competitors must be engaged in the drug business, not being proprietors or having passed examination, and must furnish, with the answers sent, their real names and addresses. Answers to each of the questions must be written on *separate sheets* or slips of paper, and must be followed by the name and address of the competitor. It is trusted that all answers sent will be the *bona fide* work of competitors, and that no assistance will be sought except such as is afforded by books. Any attempt to copy *verbatim*, or in part, from any published work, will impair or altogether nullify any value which might otherwise have been assigned to such answer.

The same competitor may not carry off more than one First Prize and one Second Prize during the term of six months.

Answers requiring calculation and involving fractions must be given in decimals, which need not be carried beyond the third place.

The following books are offered this month as prizes:

FIRST PRIZES.	SECOND PRIZES.
PARRISH'S *Pharmacy.*	GRAY'S *First Lessons in Botany.*
GARROD'S *Materia Medica.*	WITTSTEIN'S *Pharmaceutical Chemistry.*
GRAY'S *Manual of Botany.*	ROSCOE'S *Chemistry.*
FOWNES' *Chemistry.*	PAREIRA'S *Selecta e Præscriptis.*
ATTFIELD'S *Chemistry.*	*British Pharmacopœia.*
SQUIRE'S *Companion to the Pharmacopœia.*	*U. S. Pharmacopœia.*
BENTLEY'S *Manual of Botany.*	KAY-SHUTTLEWORTH'S *Principles of.*
REDWOOD'S *Supplem't to the Pharmacopœia.*	*Modern Chemistry.*
	PRESCOTT'S *Proximate Organic Analysis*

Successful competitors may select from any of the above works, and, on notifying the Editor, the book selected will be forwarded by post.

Contestants may forward their answers by book post, at the rate of four ounces for one cent, provided the rules be adhered to of leaving open the ends of the package, so that the contents may be easily examined; not enclosing any matter which could be deemed correspondence; and endorsing the packet "*Manuscript. By Book Post.*"

Address *Can. Pharm. Jour.*, Box 517, TORONTO.

QUESTIONS.

1. *Chemistry.*—(1) What is the generally recognized theory regarding the nature of light. (2) Define the terms *reflection* and *refraction.* (3) State the law affecting reflection from plane surfaces. (4) State the general law relating to refraction. (5) By what means may a ray of white light be decomposed according to the refrangibility of the rays composing it. (6) What aids to analysis do the spectra of incandescent volatile substances afford. (7) How may the nature of many colored liquids be discovered by the use of a prism. (8) What do you understand by double refraction; (9) and polarization. (10) Describe the application of polarized light to chemical analysis.

2. *Pharmacy.*—What strength of spirit would you consider most suitable to extract the active principle or principles of the root of *Veronica Virginica.* Given some of the root and a quantity of spirit 65 over proof, write out a formula for a pint of tincture. Name the constituents of the resulting preparation.

3. *Materia Medica.*—Glycerine, Ammonia and Chloral Hydrat. How are they obtained? Give their preparations, properties, and doses.

4. *Botany.*—What difference exists in structure of leaves of monocotyledonous and dicotyledonous plants? Give description and sketch the outline of leaves of following. *Quercus Nigra, Æsculus, Acer Saccharinum, Convallaria, Eupatorium.*

5. *Prescriptions.*—Translate the following prescription, and parse the directions beginning from "Fiat:"

Recipe—Tincturæ Calumbæ, drachmas duas, Acidi Sulphurici Diluti, guttas quindecem, Aquæ Cinnamomi, unciam, Syrupi Aurantii, drachmas duas.

Misce—Fiat haustus, quarta quaque hora sumendus; et tempore usus, adde singulis, si opus fuerit, ad præcavendam diarrhœam, tincturæ opii, guttas tres.

6. *Dispensing.*—Describe the different methods at present known, of combining Phosphorus for dispensing purposes, and state the dangers and objections to each.

LAST MONTH'S QUESTIONS.

It is rather discouraging that only seven answers were received to our last questions—more particularly as two months were given wherein to make the trial. For the future we shall have to adopt the rule to continue the questions until at least ten answers have been received.

Chemistry.—This question, though simple enough, required some little labour in the necessary calculations, and for this reason has, apparently, received little attention. The following statements should render the matter easily understood.

If 32 kinds of S. produce 98 kilos of H_2SO_4 what will 40 kilos S. produce?—122·500 kilos.

What amount of B.P. acid, S.G. 1·842, 96·8 per cent. will equal 122·5 kilos of 100 per cent. acid?—126·549 kilos.

One kilo of water equals 0·220 imperial gallons, what will 126·549 kilos equal?—27·840 imperial gallons.

Water of specific gravity 1.000 occupies 27·840 imperial gallons, what quantity of acid of sp. gr. 1·843 will occupy the same space? 15·105 gals. *(Answer).*

Pharmacy.—This question only requires a little attention and care in the examination of the pharmacopœia, and some work on materia medica, and need not be explained. E. B. S.

Prescriptions.—There are generally several forms in which any prescription can be put into full Latin, either of which may be correct grammatically. We must try to select that which is most convenient. The following is a correct answer to the September question:

Recipe—Pilulæ Hydrargyri. Extracti Colocynthidis Compositi, ana semidrachmam. Extracti Hyosciami, Pulveris Ipecacuamhæ ana grana tria.

Misce, et divide in pilulas duodecim, quarum æger sumat unam vel duas pro re nata.

Dispensing.—To make one ounce of cod liver oil into an emulsion, three drachms of pulv. acacia should be placed in a suitable mortar, to this add two drachms of water, and rub together until a very thick mucilage is formed; then add about one drachm of the oil, and rub until it is emulsified, then another drachm, and so on until all the oil is added. Lastly the water must be gradually added. There is no other method at all comparable to this, so far

as the writer knows, for making a good presentable emulsion. When well prepared it should look exactly like milk, but a little whiter. It was very discouraging and unsatisfactory to find that at the last examination only a very few of the emulsions prepared by the candidates came up to this standard. In future examinations inefficient dispensing will be likely to tell more seriously on the success of young men. E. G.

ORDER OF MERIT.

Maximum Number of Marks = 60.0.

No.	NAME.	Chemistry.	Pharmacy.	Materia Medica.	Botany.	Prescriptions.	Dispensing.	Total.
1	R. McCormick, Ottawa	10	9	10	9	9	10	57
2	W. W. Stephen, Meaford	9	6	9	10	10	5	52
3	J. R. Dodds, Orangeville	10	5	8	5	10	10	48
4	"Aloes," Pembroke	5	7	9	10	9	5	45
5	"Catechu," Toronto	4	5	8	7	5	10	39
6	A. I. Thompson, Strathroy	6	4	7	6	7	0	30
7	W. J. Wilson, Kingston.....	5	6					

The First Prize is awarded to Mr. R. McCormick, Ottawa.; the Second Prize to Mr. W. W. Stephen, Meaford.

Mr. Wilson's answers were not received until the 23rd, and could not therefore be sent away for estimation in the last four branches.

Varieties.

Bohemian Glass Bad for Chemical Analysis.—M. P. Truchot states that glass vessels in which various liquids, and even pure water are boiled give up by degrees a small quantity of their substance, silica, potash, soda, and lime. The analysis is the more erroneous the longer the boiling is kept up. This, at least, is what results from the use of glasses brought from Germany, and sold at Nancy in 1873 and 1874. This fact may be shown by boiling in a flask pure water mixed with a tincture of red cabbage or syrup of violets, slightly reddened by an acid. After boiling for a few minutes, the liquid turns green. French glasses, with a base of soda, are not sensibly attacked, and therefore do not offer this inconvenience.

Cement for Porcelain.—Milk is coagulated by means of acetic acid, and the caseine thus formed well washed in water, and then dissolved in a cold saturated solution of borax: a clear solution is thus obtained which is superior to gum arabic in adhesive power, and is colorless. For porcelain, this liquid is mixed with finely-powdered quick-lime, and the resulting cement quickly brushed over the fractured surfaces, which are then bound together; the ware is then dried at a gentle heat.

TEST FOR LEAD IN TIN VESSELS.—M. Fordas recently communicated to the French Academy of Sciences the following simple method of determining presence of lead in tin vessels employed for packing articles of food. The metal to be tested is first touched with nitric acid, and then heated, when the acid evaporates. If the lead be contained, stannic acid and nitrate of lead remain. Iodide of potassium is then applied, forming yellow iodide of lead, while the stannic acid is white. The yellow stain, therefore, indicates lead, the white, tin.

AMMONIA FOR EXTINGUISHING PETROLEUM FIRES.—Ammonia proves an effecual extinguisher of benzoline and paraffine flame. Recently, at Nantes, a fire which had broken out in a cellar containing these dangerous articles, and defied all attempts to quench it, was instantaneously extinguished by pouring down 70 litres of ammonia.

REMOVAL OF ACID STAINS FROM BLACK CLOTH.—The yellow stains formed on brown, or black woollen goods, by nitric acid can be removed, when freshly formed, by moistening them repeatedly with a concentrated solution of permanganate of potash, and then rinsing with water. Yellow stains on the hands may be treated in the same way, and the dark brown coloration produced may then be removed by treating aqeous solution of sulphurous acid.

CORK DUST.—Bourgeois, of Paris, suggests the application of finely-pulverised cork, or cork dust, to various purposes, those of the toilette more especially, for which rice and wood powders have hitherto been used.

Registrar's Notices.

RENEWALS CONTINUED.

Barclay, N. F., Wardsville.
Berry, G. W., Lucknow.
Brierley, Richard, Hamilton.
Chidley, Geo., Clinton.
Conklin, W. P., Chatham.
Corbett, R., Rosemont.
Cummines, Thos., Welland.
Dillworth, J., Toronto.
Dutton, J. W., Brussels.
Eadie, A. B., Wingham.
Eakins, J. M., Stratford.
Eccles, D., Parkhill.
Egar, W. G., Millpoint.
Fead, W., Cannington.
Lander, J. C., Yorkville.
Leith, D. C., Port Stanley.
Mallory, M. B., Napanee.
O'Connor, T. J., Toronto.
Perrin, Samuel, Lindsay.
Perry, J. J., Napanee.
Wallace, N. C., Woodbridge.
Wallace, T. F., Woodbridge.

NEW REGISTRATIONS.

Mitchell, Chas. A., Toronto.
Zoellner, O. H., Waterloo.

GEO. HODGETTS, Registrar,
305 Yonge Street, Toronto.

DRUGS, MEDICINES, &c.	$ c.		$ c.
Acid, Acetic, fort	0 13	@	0 14
Benzoic, pure	0 22		0 27
Citric	1 05		1 15
Muriatic	0 03½		0 05
Nitric	0 10		0 13
Oxalic	0 20		0 23
Sulphuric	0 03		0 05
Tartaric, pulv	0 49		0 50
Ammon, carb. casks	0 22		0 24
" jars	0 23		0 24
Liquor, 880	0 25		0 28
Muriate	0 14		0 15
Nitrate	0 45		0 60
Æther, Acetic	0 45		0 50
Nitrous	0 40		0 42
Sulphuric	0 50		0 50
Antim. Crude, pulv	0 15		0 17
Tart "	0 52		0 60
Alcohol, 95 per ct. Cash	2 19		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	1 10		1 15
Peru	3 40		3 75
Tolu	3 00		3 50
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	0 62		1 10
Vanilla	14 00		20 00
Bismuth, Alb	2 50		2 75
Carb.	2 65		2 90
Camphor, Crude	0 33		0 40
Refined	0 43		0 47
Cantharides	1 85		1 90
Powdered	2 00		2 10
Charcoal, Animal	0 04		0 06
Wood, powdered	0 10		0 15
Chiretta	0 23		0 30
Chloroform	1 10		1 55
Cochineal, S. G	0 58		0 70
Black	0 75		0 90
Colocynth, pulv.	0 60		0 65
Collodion	0 70		0 80
Elaterium oz	3 20		4 00
Ergot	0 70		0 75
Extract Belladonna	1 65		1 80
Colocynth, Co	1 25		1 75
Gentian	0 50		0 60
Hemlock, Ang	0 00		0 95
Henbane, "	3 00		3 20
Jalap	5 00		5 50
Mandrake	1 75		2 00
Nux Vomic oz	0 40		0 50
Opium oz	1 10		
Rhubarb	5 00		5 50
Sarsap. Hon. Co	1 00		1 20
" Jam. Co	3 50		4 00
Taraxacum, Ang	0 70		0 80
Flowers, Arnica	0 17		0 25
Chamomile	0 28		0 32
Gum, Aloes, Barb. extra	0 70		0 80
" " good	0 40		0 50
" Cape	0 16		0 20
" " powdered	0 20		0 30
" Socot	0 50		1 35
" " pulv	1 00		0 00
Arabic, White	0 38		0 60
" powdered	0 60		0 75
" sorts	0 19		0 24
" " powdered	0 42		0 50
" com. Gedda	0 13		0 16
Assafœtida	0 40		0 42
British or Dextrine	0 13		0 15
Benzoin	0 35		0 75
Catechu	0 12		0 15
" powdered	0 25		0 30
Euphorb, pulv	0 35		0 40
Gamboge	1 00		1 20
Guaiacum	0 45		1 00
Myrrh	0 50		0 85

DRUGS, MEDICINES, &c.—*Contd.*	$ c.		$ c.
Sang Dracon	0 60		
Scammony, powdered	5 50		6 00
" Virg. "	14 50		—
Shellac, Orange	0 75		0 80
Gum, Shellac, liver	0 55		0 60
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 14		0 16
Iron, Carb. Precip	0 20		0 25
" Sacchar	0 40		0 55
Citrate Ammon	1 40		1 50
" & Quinine, oz	0 52		0 55
" & Strychine	0 20		0 25
Sulphate, pure	0 08		0 10
Iodine, good	3 90		4 20
Resublimed	5 10		5 50
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 15		0 16½
Leptandrin oz.	0 60		—
Liq. Bismuth	0 50		0 60
Lye, Concentrated	1 40		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 65		0 75
Citrate gran.	0 60		0 75
Mercury	1 25		1 35
Bichlor	1 30		1 50
Chloride	1 50		1 70
C. Chalk	0 65		0 70
Nit. Oxyd	1 70		1 90
Morphia Acet	3 00		3 20
Mur.	3 00		3 20
Sulph	3 20		3 40
Musk, pure grain oz	25 00		—
Canton	0 60		1 20
Oil, Almonds, sweet	0 45		0 47
" bitter	14 00		15 00
Aniseed	4 25		4 50
Bergamot, super	6 50		7 00
Caraway	3 20		3 50
Cassia	2 00		2 25
Castor, E. I	0 12½		0 14
Crystal	0 22		0 25
Italian	0 26		0 28
Citronella	1 05		1 15
Cloves, Ang	3 75		3 80
Cod Liver	1 50		1 60
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 80		4 00
ord	3 20		3 40
Orange	3 00		3 25
Origanum	0 65		0 75
Peppermint Ang	15 00		16 00
" Amer.	5 00		6 00
Rose, Virgin	8 50		8 75
" good	7 00		7 25
Sassafras	0 75		1 90
Wintergreen	4 40		4 60
Wormwood, pure	4 00		6 00
Ointment, blue	1 10		1 20
Opium, Turkey	6 25		6 50
pulv	9 00		9 50

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 35	0 36
" good	0 15	0 20
Pill, Blue, Mass	1 10	1 20
Potash, Bi-chrom	0 16	0 18
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 35	0 40
Nitrate	8 00	9 00
Potassium, Bromide	60	0 70
Cyanide	0 60	0 70
Iodide	3 40	3 60
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
Phosphorous	1 10	1 20
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 17	—
" 100 oz. case.	2 12	—
" 25 oz. tin..	2 12	—
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 17	0 20
Ipecac, "	1 50	1 60
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	0 75	0 90
" " pulv	1 00	1 10
" " 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	1 00	1 10
Spigelia	0 25	0 30
Sal., Epsom	2 50	3 00
Rochelle	0 30	0 32
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 15	0 17
Cardamon	2 00	2 10
Fenugreek, g'd	0 08	0 09
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	0 75	0 85
Spanish	10 00	11 00
Santonine	8 50	8 75
Sago	0 08	0 09
Silver, Nitrate Cash	14 85	16 50
Soap, Castile, mottled	0 11	0 14
Soda, Ash	0 03¾	0 05
Bicarb. Newcastle	5 75	6 25
" Howard's	0 14	0 16
Caustic	0 05½	0 05¾
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 00	2 20
Sulphur. Precip	0 10	0 12½
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 65	2 80
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09	0 10
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 85	0 90
Extract	0 26	0 30

DYESTUFFS—*Continued.*		
Japonica	0 07	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 01⅞	0 03
Logwood, Camp	0 02½	0 03
Extract	0 12¼	0 13
" 1 lb. bxs	0 15	—
" ½ lb. "	0 14	—
Madder, best Dutch	0 11	0 12
2nd quality	0 10	0 11
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 55	0 60
Cayenne	0 22	0 28
Ginger, E. I.	0 19	0 20
Jam	0 30	0 30
Mace	1 40	1 60
Mustard, com	0 20	0 25
Nutmegs	1 15	1 25
Pepper, Black	0 20	0 21
White	0 31	0 32
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 01⅞
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07½	0 08
Venetian	0 02½	0 03⅛
Sienna, B. & G	0 07	0 08
Umber	0 07	0 10
Vermillion, English	1 50	1 60
American	0 25	0 35
Whiting	0 1	0 1½
White Lead, dry, gen	0 08⅛	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03⅛
Zinc White, Star	0 10	0 12
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 11	0 12
Putty	0 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 45	—
" No. 1	2 20	—
" No, 2	1 95	—
" No. 3	1 70	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	3 90 @	4 25
Rosin, Strained	3 30	4 25
Clear, pale	5 75	7 25
Spirits Turpentine	0 53	0 56
Tar Wood	3 90	4 25
OILS.		
Cod	0 65 @	0 70
Lard, extra	1 10	1 20
No. 1	105	1 10
No. 2	0 90	0 95
Linseed, Raw	0 57	0 60
Boiled	0 62	0 64
Olive, Common	1 05	1 10
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 67½	0 70
Straw	0 62½	0 65
Sesame Salad	1 30	1 35
Sperm, genuine	2 65	
Whale refined		