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Original and Selected Papers.

A FEW PRACTICAL REMARKS ON WHITE LEAD AND ITS ADULTERATIONS.

BY E. B. SHUTTLEWORTH.

The trade in ground white lead is generally characterized by the closest competition. Prices are cut down, and profits grow correspondingly less until the point is reached beyond which the manufacturer cannot go without seriously endangering his honesty. This limit has been so often overstepped, that the purchaser has almost become reconciled to swallow his dose of adulteration without enquiry other than that which relates to the price paid for the admixture. This appears to be, to some extent, the true state of the case, and so long as the matter is so understood no great harm can result, either to the conscience of the manufacturer or the pocket of the purchaser. Sometimes, however, the buyer is ignorant of this arrangement, and deceived by the representations of the unscrupulous, purchases, in good faith, and at an unfair price, the most worthless compound. The ease with which white lead may be adulterated, and the difficulty attending its detection by the uninitiated, render this kind of fraud of very common occurrence. One writer, whose appreciation of the fitness of things is scarcely in accordance with

strict morality, boldly remarks that a certain mineral was expressly created for the purpose of adulterating white lead, being good for nothing else. The utilitarianism of this observation has an unhealthy odour about it, and, it is to be feared, is of the earth, earthy. However this may be, it is certain that our lead grinders have taken every advantage of the supposition.

It is not our province at present to enquire closely into the moral bearing of this so-called adulteration. It may, however, be said that, provided there is no secrecy or misrepresentation practiced the addition of sulphate of baryta to white lead scarcely comes within the acknowledged meaning of the term adulteration, although it is, strictly, a case of foreign admixture. There is an implied concealment—a fraudulent intention—associated with the word which renders it inapplicable. Let us take a parallel case for comparison. Alcohol is sold at prices corresponding with its degree of dilution. If, for certain purposes, a strong spirit is required, it may be obtained by paying therefor; a fair price. If a weaker spirit will answer the intended purpose it is obtained at a price proportionately lower. With ground white lead the case is similar, a pure article may be had for a stated price, but if the purchaser cannot afford this, or thinks that a lower grade will do, he obtains it at a lower figure. There are two points in which these instances do not correspond; one is that the water used in the dilution of the spirit is practically worthless, while the baryta used in the *dilution* of the lead possesses a certain value as a pigment. The other point of dissimilarity is that alcohol is sold as containing a stated percentage of spirit, while white lead is graded according to certain commercial terms which have no fixed value. In this case the purchaser must depend on the conscienciousness of the manufacturer, or the reputation which his wares have acquired.

In this, as well as other countries, there are, undoubtedly, some manufacturers in whom implicit confidence might be placed without fear of betrayal; there are, however, many others of whom this cannot be said. In any case it is better for the dealer to satisfy himself that he is being justly dealt with, if only that his own representations may be established on a substantial basis. The writer has frequently been called upon to make examinations of this kind, and it is hoped that a few remarks based on the experience so gained may not prove unacceptable.

CHARACTERISTICS OF PURE WHITE LEAD.

This pigment is not of constant chemical composition. Different samples, prepared by the same process, and by the same manufacturer, are often found to differ slightly. If the chemical composition of white lead could be relied on, the determination of the purity of a sample could at once be arrived at by estimating the amount of metal present. It is usually supposed that this pigment is a carbonate, but many analyses have proved that there is always a certain amount of hydrate present. Some writers assert that the quality and the commercial value depends on the relative proportions of these two compounds, and that the best white lead contains two equivalents of the carbonate to one of hydrated oxide. Such a compound might be represented by the formula $2\,(PbO,CO_2)\,PbO,HO$. If the compound contains a greater amount of carbonate than this, it is said that the body or covering power of the pigment depreciates in a like proportion. It is possible that this may be the case, but it is also likely that there are other conditions, incident to the process of preparation, which influence the result. It is, in great measure, to this opacity or covering power, that the value of white lead depends. There are other pigments of equally good color, and some perhaps as durable, but all are deficient in the matter of body. If either white lead, or oxide of zinc, be mixed with linseed oil, a partial saponification of the oil takes place. At ordinary temperatures this change is effected very slowly. This fact will account for the general belief that these pigments, when ground in oil, improve by age. Painters are well aware of this, although they may not be acquainted with the reason of it. It is found, however, that old white lead resists the action of the air and weather, and spreads better under the brush than that which has been recently ground. Paint made with sulphate of baryta does not possess these characteristics, as the varnish-like skin, formed by the action of the air on the oil, is soon destroyed, and the underlying layer of paint is consequently without protection, and may be easily washed or rubbed off.

The color of white lead depends, to a great extent, on the purity of the metal from which it is prepared. It will readily be seen that traces of such metals as copper or iron would give a tinge to the pigment, although the quantity present might be almost inappreciable, as far as weight is concerned. The purity of the water employed in the process has, probably, some influence on color. It is

often found that a sample of dry white lead of the purest color, may possess a dark shade when mixed with bleached oil. It is likely that this is due to the presence of a minute trace of carbonate of lime, derived from the source alluded to.

From what has been said it may be concluded that samples of unadulterated white lead may possess very different pigmentary values. The particles of the compound may be crystalline and translucent, or flakey and opaque, hence the difference in the *body*. From want in care in the purification of the metal, or the preparation of the white lead, contaminations may be present which affect the *color*, and again we have conditions which affect the *durability* of the paint. Of the various substances used for the adulteration of lead, the following enumeration may be made:—sulphate of baryta, carbonate of baryta, sulphate of lead, sulphate of lime, carbonate of lime and oxide of zinc. Although oxide of zinc is of more value than white lead, it is not unfrequently met with as an adulterant. There is an impure variety of this substance prepared in the United States, which consists of a mixture of sulphate of lead and oxide of zinc, and as the price of this compound is below that of white lead, it is possible that this is the source of the adulteration.

ANALYSIS OF GROUND WHITE LEAD.

In making an examination of ground white lead, in order to ascertain its purity, we must first deprive it of the oil with which it is mixed. A weighed sample, say 100 grains, is introduced into a small flask, and agitated with petroleum naphtha, or sulphuric ether. After allowing the sediment to fall, the supernatant liquid is poured off, and a fresh portion added, until a drop of the washings, placed upon glass, evaporates without residue. The solid portion must now be turned out into a small capsule, and the last traces of naphtha or ether volatilized by the application of a gentle heat. The weight of the dried residue deducted from the original weight of the paint will give the proportion of oil present. There is seldom more than 10 per cent.—from 8 to 12 is the outside limit.

Treat the powder thus obtained with dilute nitric acid—say half a fluid ounce of acid to two ounces of water. If the quantity of water is much less than this, a precipitate of nitrate of lead will be deposited, which might be mistaken for insoluble impurities. If the powder dissolves without residue, the absence of the sulphates of baryta, lime, and lead may be assumed. If a solid residue remains,

it may be washed in a small portion of water, dried, and weighed. The washings should be added to the clear solution first obtained.

To detect the presence of lime, add to one half of the solution an excess of liquor ammoniæ, decant from the precipitate, washing with a small portion of water, which must be added to the solution. Treat the decanted liquid with a solution of carbonate of potash; lime, if present, will be precipitated as a carbonate, and can thus be estimated.

To test for carbonate of baryta, add to the remaining half of the first solution an excess of sulphuric acid. Sulphate of lead accompanied by sulphate of baryta, if present, is precipitated. By heating this with a little hydrochloric acid, the sulphate of lead will be dissolved. The remaining sulphate of baryta may be washed, dried, and its equivalent of carbonate calculated therefrom.

To the solution decanted from the precipitated sulphates in the last operation add a few drops of sulphide of ammonium. The presence of zinc will be shown by a copious white precipitate,

The body, or covering power of ground white lead is a matter which is difficult to decide by any accurate test. Various methods have been proposed, one of the best is that of Prof. Chandler.* In this 100 grains of the sample is thoroughly incorporated with ½ a grain of lampblack, and 4 drops of oil, and the mixture is spread by means of a spatula, upon a sheet of window glass of a size of 6 by 12 inches. The color of the layer is compared with that produced by a similar treatment with a sample of white lead of ascertained good quality. This method requires considerable experience, as indeed, do all others. The writer has found that by omitting the lampblack, and holding the painted sheet of glass between the eye and a strong light the opacity of the particles may be compared and estimated as readily as by any other method.

In examinations of this kind it must be borne in mind that a finely ground pigment, when compared with that in which the particles are in a coarser state of division, will always appear to have a better body, although its quality may be similar; allowance must be made for this in making estimations of this kind.

In comparing the colors of samples of dry lead, a little of the powder should be mixed with a few drops of bleached oil, and the

*Scientific American, Vol. XX., No. 19, p. 293.

light employed should be free from the effects of reflection from colored surfaces—as brick walls; or from transmission through colored media, as dark clouds or dirty windows.

It is not improbable that a microscopical examination of the various grades of white lead might afford some clue to their value. The writer intends to pursue this subject, and hopes to be able to offer some information at a future day.

TINCTURE OF CINNAMON,*

BY THOMAS GREENISH, F.C.S.

It will be in the recollection of those who were present at the last meeting of the Society in December that a paper by our President, "On the Syrup and Resin of Tolu, and Tincture of Cinnamon," was, from the lateness of the hour, taken as read. There was consequently no discussion, and the paper was printed in the Journal of the following week. I had a few observations to make on one of the preparations, namely, tincture of cinnamon, and, with the view of raising a discussion on a subject so eminently practical, and thereby eliciting the opinion of the members on some points in connection with it, I have embodied my remarks in the present paper. The sample shown by our President, which had undergone decomposition, was that of tincture of cinnamon, and is now on the table. I have also here a specimen of the compound tincture of cinnamon, in which similar changes, as regards the cinnamon which it contained, seem to have taken place.

Whilst engaged in the investigation of this subject, and going over the old Journals, a paper "On the Decomposition of Cinnamon Water," Vol. I., page 207, by the late Mr. Jacob Bell, attracted my attention. It is there stated, "The Cinnamon Water having

*Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 7, 1872, and published in the Pharmaceutical Jour. and Trans.

lost its peculiar properties, it was found on examination that a quantity of cinnamic acid had separated in crystals;" and Mr. Redwood observed, "From the investigations of a German chemist, it appears that oil of cinnamon, when exposed to the air, absorbed oxygen very rapidly, giving rise to the formation of cinnamic acid, and two resins—resin alpha and resin beta."

The result of some carefully-conducted experiments by Mr. W. Bastick, which will be found in a paper in Vol. VII., page 268, on "The acetous fermentation of some of the alcoholic preparations of the Pharmacopœia," seems to prove that in most proof-spirit tinctures, if kept for a time in bottles more or less full,—in fact, the condition in which they are usually found on the shelves of a dispensing establishment—and at a temperature of from 60° to 80° F., there is a decomposition of the alcohol, and a partial destruction of the vegetable principles themselves, the proof-spirit tinctures only being liable to this change. Among others which he had observed to decompose he mentions the compound tincture of cinnamon; and his experiments point to one remedy, a stronger alcoholic solution as a menstruum.

Taking the same view of the cause and the remedy, and to guard against a similar decomposition in the simple or compound tincture, I made each of them with 6 parts spirits and 2 parts water, instead of 5 and 3, and the result has been that under the same conditions, neither of the tinctures at the present time show any signs of change.

Consulting the continental Pharmacopœias with reference to this subject, I find that the spiritus vini dilutus of the Austrian pharmacopœia is stronger than our proof-spirit; it has a sp. gr. ·892; and the spiritus vini rectificatus, which is its equivalent in the Prussian Pharmacopœia, and with which their tinctures of cinnamon are made, is about the same as the strength of spirit which I have found it desirable to use in making these two preparations.

I now approach a much larger subject, but one, I think, quite worthy of consideration,—whether having regard to the proximate principles of the several substances which constitute the ingredients of a tincture, the relative proportion of spirits and water may not in some instances be varied with advantage as regards solubility, also with a view to the permanence of the resulting preparation.

On reference to the British Homœpathic Pharmacopæia, a work that I would recommend to the careful perusal of every pharmacist, there are some very pertinent remarks, which I take the liberty of quoting, on the preparation of the tinctures contained in it, and it will be observed that six different strengths of spirits are employed.

"1st. *Dilute Alcohol.*—This is made by mixing equal measures of rectified spirit and distilled water. The mixture should have a density of ·935, and contains 42 per cent. of absolute alcohol.

"2nd. *Proof Spirit* (British Pharmacopœia).—This is made by

mixing 5 measures of rectified spirit with 3 of distilled water. It should have a density of ·920, and contain 49 per cent. of absolute alcohol.

"3rd. *Spirit of* 20 *O. P.*—This is made by mixing 6 measures of rectified spirit with two of distilled water. It should have a density of ·888, and contains 63 per cent. of absolute alcohol.

"4th. *Spirit of* 40 *O. P.*—This is made by mixing 7 measures of rectified spirit with 1 of distilled water. It should have a density of ·865, and contains 73 per cent. of absolute alcohol.

"5th. *Rectified Spirit* (60 O. P.) has the density of ·830, and contains 84 per cent. of absolute alcohol.

"6th. *Absolute Alcohol* having a density of about ·793 is required for a few of the preparations."

Again, under the head of tinctures, it is very properly stated that "the objects to be attained in these preparations are the following:—

"1st. A preparation containing all the soluble ingredients of the substance employed.

"2nd. A uniform strength, so that it may be always known exactly how much of the dry crude material is represented in a given measure of the tincture."

And it further states that "these objects may be obtained in the following manner:—

"1st. The complete solution of all soluble matter can be accomplished by varying the alcoholic strength to suit the nature of the ingredients in each plant, using a very dilute spirit where the ingredients are chiefly soluble in water, and a strong spirit where the alcohol is the best solvent."

Referring to the practice in this Pharmacopœia with regard to tincture of cinnamon, I find that rectified spirit is used as a menstruum.

A paper by Mr. Giles, read before the Bristol Pharmaceutical Association, will be found in the Journal of January 20th, in which the author reviews the Pharmacopœial tinctures generally with reference to their alcoholic strength, and expresses an opinion that the subject is deserving of more attention than it appears to have received. Mr. Giles has so ably stated the case, that I need do no more than refer to that paper as containing pretty well all I have further to say on this part of the subject; and in conclusion, I am of opinion that many of the proof-spirit tinctures of the British Pharmacopœia may, with a view both to permanence and efficiency, be made with a stronger solution of alcohol than that of 5 and 3, which constitutes our proof spirit.

SENEKA.*

BY R. ROTHER.

Polygalic acid, the active agent of seneka root, is invariably accompanied by another peculiar body, termed virgineic acid. When seneka root is treated with water, the polygalic acid alone dissolves. But when alcohol is employed as the solvent both the polygalic and virgineic acids are extracted. If the aqueous infusion is now condensed, and the syrupy residue treated with alcohol, the polygalic acid is precipitated. Pure polygalic acid is, therefore, insoluble in alcohol. If now the alcoholic tincture of seneka is concentrated to a syrupy liquid by evaporating the alcohol and then water be added, the virgineic acid precipitates whilst the polygalic acid remains in solution.

Virgineic acid, either alone or associated with polygalic acid, is therefore insoluble in water. Now since polygalic acid is readily dissolved by alcohol only in the presence of virgineic acid, it becomes evident that the latter determines the solubility in that menstruum.

Pectin and albumin are two inert constituents of seneka root, which, by reason of their proneness to decompose, must always be avoided in its preparations. Both are soluble in water and weak alcohol.

Consequently, if officinal alcohol is used as the menstruum for exhausting the activity of seneka root, these injurious bodies will be totally excluded from the preparation

It would now seem that with the use of officinal alcohol all difficulty had been overcome; but the residuary mixture of polygalic and virgineic acid after the expulsion of the alcohol forms, by the addition of water, an opaque intensely milky mixture, owing to the finely divided state of the insoluble virgineic acid. Although virgineic acid is insoluble in cold water, it nevertheless dissolves quite freely in this when hot, yet again separates on cooling in more compact creamy flakes, whilst the intervening liquid seems transparent and clear. The milky liquid at first obtained passes readily through a filter, but unaltered in appearance. However, the same liquid after being heated and again cooled utterly defies filtration, as the impervious precipitate rapidly fills the pores of the paper.

Since the active ingredients of seneka possess acid characters, they will naturally combine with some bases, for instance, the alkalies. This is unquestionably true in case of virgineic acid, as it is instantly dissolved by ammonia, potassium or sodium hydrate, or their normal carbonates, and is immediately reprecipitated by the addition of an acid.

*From the Pharmacist.

Acting upon the circumstance that the annoying presence of virgineic acid can be tolerated by the intervention of a base, the writer, about two years ago, devised a process for syrup of seneka and compound syrup of squill, which rested upon the application of officinal alcohol and ammonia.

Disodic carbonate would have formed a more stable combination, but it was rendered wholly objectionable by the fact, that many acidulous preparations, as syrup of squill for example, so frequently used in conjunction with these syrups, was rendered entirely incompatible by the antagonism of the acid in one and carbonated alkali in the other.

Ammonia was therefore adopted, but a similar objection in regard to acid preparations ruled here since the virgineic acid was invariably liberated. Even after the beautiful and clear syrup had been prepared a few days, the affinity between the ammonia and virgineic acid relaxed, and the latter again floated free. Upon this the writer resorted to the use of magnesium carbonate to clarify the milky mixture of polygalic and virgineic acid, a precedent already given in other syrups. This was attended with good success, and the process was published.

In the process given the writer adhered to the excellent menstruum, the officinal alcohol which so readily exhausts the activity, and so thoroughly excludes the inert fermentable matters, but merely replaced the caustic alkali by magnesium carbonate which, by mechanical absorption, *removed* the virgineic acid. To economize menstruum the writer recommended repercolation; but a single percolation with more menstruum was optional. Subsequently, this process, however excellent, was abandoned for a simpler and more expeditious one.

Syrups are aqueous preparations containing sugar as a preservative of certain substances in the administration of which alcohol is sought to be avoided. Yet, nevertheless, in the majority of these preparations the absence of alcohol in a therapeutic view is not absolutely required. But its presence in a pharmaceutic one is often indispensable to the permanence of such preparation where sugar alone fails to preserve. It is, therefore, the opinion of the writer, that in syrups where the sugar alone suffices, alcohol should not enter, but wherever it is required, no scruples should be entertained against its presence.

In the new modification a great difficulty is obviated by using the root in coarse powder. The objection to this procedure is again compensated by a short maceration before the root is packed and percolated. A very weak alcoholic menstruum is used, about one-sixth to one-quarter alcohol; the percolate is slowly heated to boiling, the albumin precipitated and a considerable proportion of the alcohol is expelled; enough, however, remains for the purpose intended; after cooling the liquid is filtered; this proceeds rapidly,

the filtrate being perfectly clear and transparent. The sugar is now dissolved in this by heat, and the syrup strained through muslin while hot. Less sugar than usual is taken, and still the syrup is thick, permanent, clear, and transparent, and possesses the peculiar sparkling brightness imparted to syrup by alcohol in a high degree.

Syrup of seneka is prepared as follows :—

Take of Seneka root in No. 24 powder, 8 troy ounces.
Sugar, 32 troy ounces.
Alcohol.
Water, of each sufficient.

Mix 1 part of alcohol with 3 of water, pour 8 fluid ounces of this on the seneka, macerate twenty-four hours, and pack moderately firm in a cylindrical percolator, forming a column of medium height; then pour on the menstruum until 2 pints of percolate has passed, heat this slowly to boiling, maintain the temperature ten or fifteen minutes, evaporate to 22 fluid ounces, let cool, and filter, then add the sugar, apply heat until this has dissolved, and strain through muslin while hot. The product measures 2½ pints.

THE ODOURS OF PLANTS.*

BY JAMES BRITTEN.

The subject of the phenomena of odour and colour in plants, and of the causes which induce and govern them, is one of considerable interest; and the relations which exist between the two are sufficiently striking. Thus, it has been statistically ascertained, and a very little reflection will confirm the conclusion, that white flowers stand highest in number among fragrant species, next yellow, then red, and lastly, blue. And it is among white flowers that disagreeable odours are most seldom found, while orange and brown are frequently unpleasant in scent. In such calculations, however, it must be remembered that the appreciation of odours is by no means the same to different people: scents which are agreeable to one, are often the reverse to another. The strong odour of *Tagetes patula* and *T. erecta* is not objectionable to some; while others, besides the well-known fox-hunter, are of opinion that the Sweet Violet is a "stinking flower." There are even some unhappy beings—we trust they are but few—who cannot endure the scent of a rose. The sense of smell, too, is much more acute in some

*Gardners' Chronicle in Pharmaceutical Journal and Transactions.

persons than in others; and we have frequently remarked an analogy to color-blindness in the want of perception of odours manifested by some among our friends.

A good summary and comparison of scents will be found in M. Lecoq's 'Etudes sur la Geographie Botanique de l'Europe,' from which some of the following details are borrowed. In almost every case, however, additional instances of similarity will suggest themselves to the reader, especially if he be gifted with a keen nose, and a good memory for smells. In the first place, it may be laid down as a general principle, that a larger proportion of white flowers are fragrant than those of any other colour; yellow come next, then red, and lastly blue; after which, and in the same order, may be reckoned violet, green, orange, brown, and black.

Among white flowers, certain types of scent are very prevalent. Thus many Umbelliferous plants have a strong odour of honey, which is very marked in *Anthriscus sylvestris*, and is found also in the aquatic ranunculi: *Eucalyptus glandulosa* recals the same scent; and in the almond and apricot we encounter it, qualified by that flavour of prussic acid which is so perceptible in the hawthorn when one does not inhale too closely the fragrance of its flowers. This scent is intensified in *Spiræa Ulmaria*; in *S. Filipendula* it is modified by a *soupçon* of the odour which is found also in the privet and in *Actæa spicata*, and attains distinctness in the elder. Many Rubiaceous shrubs have similar odours, and resemble certain *Apocyneæ*; and the *Philadelphus coronarius* has so much affinity in scent with the orange, that it is often called the "mock orange bloom." Other types of scent among white flowers are presented by the white lily, the jasmine, the tuberose, and the lily-of-the-valley. It is curious to observe, that among cultivated plants, white-flowered varieties are very often the most—if not the only—fragrant ones; this is the case with the white petunia [?] and a commonly cultivated white-flowered verbena [?]. It is also worthy of notice that many of the scents among white flowers are only pleasant when in very small quantity, and become absolutely disagreeable when intensified; this is the case, especially, with the hawthorn and white lily.

Among yellow flowers, the scent of the orange is often found, we may note, in the common broom, and in *Biscutella saxatilis* and other yellow Crucifers. The curious alcoholic odour which has earned for *Nuphar lutea* its English name of "brandy-bottle" is found also in the yellow *Brugmansia floribunda*, as well as in the yellow catkins of *Salix caprea*. *Hippocrepis comosa* recalls the smell of cheese, and this odour attains its maximum in the blossoms of *Genista Scorpius*. The honey scent is found in several yellow-blossomed plants, notably in *Galium verum* and *Mahonia intermedia*.

Roses and pinks occur to one at once, when sweet-scented red-flowered plants are referred to; but with these exceptions it is diffi-

cult to characterize the odours of plants belonging to this series. But among lilac flowers a great resemblance in scent may be traced; thus the sweet odour of vanilla, which is so powerful in the garden heliotrope, is found again in different degrees of intensity in *Petasites fragrans*, *Valeriana officinalis*, and the common lilac; we meet with it also in *Plantago media*, which is exceptional among plantains in its fragrance and in its coloured corolla.

Blue flowers are very rarely fragrant, and when so, only in a slight degree. The blue variety of *Phyteuma spicata* exhales a faint perfume, and one or two campanulas are slightly scented. *Franciscea Hopeana* has, however, diliciously fragrant blossoms, which recall at once the scent of the orange and the tuberose; but although at first blue, they soon lose their colour and become white.

Certain species, the flowers of which are of sombre hues, are very fragrant. Thus in the early flowering *Calycanthus præcox*, one finds a multitude of odours, such as rose, jasmine and tuberose, harmoniously blended. The night-flowering stock (*Matthiola tristis*), *Hesperis tristis*, and one or two more, compensate by their fragrance for the absence of beauty of colour; while other dark-flowered plants, such as the henbane, have an intensely disagreeable odour.

Thus we see that it is not the most brilliant flowers which are the most fragrant, indeed many of the most brilliant in colour have no scent whatever. The beautiful *Malvaceæ* of equinoctial America, the pelargoniums of the Cape, the passion-flowers [?], the gladioli, and some of the most striking *Leguminosæ* are destitute of perfume.

One or two conclusions as to the geographical distribution of sweet-scented plants may be arrived at from the preceding facts, united with many more which space will not permit us to cite. We have seen that a large proportion of pale and white blossoms are fragrant; and it is ascertained that these predominate in northern regions. We may therefore conclude that the relative number of odorous flowers is greater towards the poles than towards the equator. It would seem that the too powerful action of light and heat is opposed to the emanation of the odours of flowers; and we see many species, which are scarcely fragrant during the day, become so in the evening or at night. But if the odours emitted by the blossoms are more frequent in the North, the reverse is the case with the essences enclosed in the glands. Plants with fragrant leaves, aromatic fruits, and wood penetrated with essential oil, are scarcely found except in warm or tropical countries.

IMPROVED PROCESS FOR PREPARING EMULSIONS OF LIGHTER VOLATILE OILS, ETC.*

BY J. WINCHELL FORBES.

Of all the processes incident to extemporaneous pharmacy there is, perhaps, no one so vexatious and tiresome as the preparation of an emulsion, especially one containing chloroform, ether, or one of the lighter volatile oils, and any improvement upon the usual "elbow grease" method will, I am confident, meet with a hearty welcome from every practical apothecary.

The advent of a recipe for the turpentine emulsion at the very last moment of a hard day's work, set the wits of the writer at work to devise some practical method of avoiding the labor and expenditure of time incident to such prescriptions, and the following process is the result:

In order to illustrate, let us imagine the following recipe handed to an apothecary for preparation.

R. Ol Terebinth.
Mucil. Acaciæ *aa* ℥j.
M.
ft. Emulsio S.A.

"Secundum artem." Very good, and what is the law of the art?

In the articles upon Mixtures in the U. S. Dispensatory, it is directed that when gum acacia is specified as the intermedium of an emulsion, it shall be brought "*previously*" into the form of U. S. P. Mucilage.

At the risk of being considered presumptuous, I take the liberty of flatly contradicting this direction—wilfully disregarding the "previously" and proceeding as follows:

First. Pour the turpentine into a two-ounce vial, and shaking so as to coat the inside of the vial with a film of turpentine; this is to prevent the action of the moisture usually present.

Secondly. I add one scruple powdered acacia, and mix thoroughly with the oil.

Lastly. Half a fluid-ounce of water is added, and the whole is well shaken. A perfect emulsion is the result, requiring less time for its preparation than to read the foregoing directions. The bottle may then be filled up with mucilage, or, according to my experience, a better product is obtained with water simply.

The deviation from the letter of the law in regard to the gum strength of the emulsion needs no apology to the practical pharmacist, as the sole object in view is to emulse the oil, and it will be

*From the American Journal of Pharmacy, Feb. 1872.

found that ten grains to the fluid-ounce of emulsion will afford a product superior in all respects (especially in fluidity) to one containing more gum, and more nearly approaching the peculiar characteristics of that most perfect of all emulsions—cow's milk.

An emulsion of turpentine prepared in this manner and allowed to stand some time, shows not the least separation of its oil, but floating on the surface of the water is a stratum of a true "cream," which, like its prototype, requires but slight agitation to mix thoroughly with its substratum.

I have for some time past kept an emulsion of oil of turpentine prepared as above, containing half its volume of oil, for use in dispensing, and as the oil is perfectly emulsed, its incorporation in any desired amount of mixture or vehicle requires no more labor or skill than in the case of a tincture or syrup. I find, also, that the emulsion rather improves by standing, the "cream" becoming more homogeneous.

It is often desirable to administer this oil in quite large doses, and it will be found that a mixture of one part of an emulsion of the above strength, with three parts of syr. wild cherry will give a preparation that is rather pleasant than otherwise, both as regards taste and odor.

Actual experiment has demonstrated that this method is applicable to all liquids that possess no solvent power as regards gum acacia, and that possess a reasonable degree of mobility. In accordance with this fact it will be found that ether and chloroform, when treated in this manner, will yield perfect emulsions, and, as the operation is conducted in a close vessel, the loss sustained in the usual process is not incurred.

The principle upon which this process is based is very simple. In the usual mortar process the cohesiveness of the intermedium has to be overcome, it being directly opposed to the union desired, whereas, in the new, the same condition of the gum does not occur until *after* the union, being then opposed to their *separation*.

LIQ. MAGNESIÆ BISULPHITIS, A REMEDY FOR CARDIALGIA (HEARTBURN).*

BY GEORGE ARCHBOLD, D.SC.

Some time ago a physician asked me the question, "Do the bisulphites prevent the butyric acid fermentation?" In order to give him an accurate answer, I promised to try two experiments. This I did. First, I proceeded to make butyric acid by fermentation of a

*Pharmaceutical Journal and Transactions, Dec. 1871.

mixture of chalk, cheese, and honey and water, and allowed the mixture to stand for four days. Secondly, in another vessel I proceeded in the same manner, using the same ingredients, with an addition of bisulphite of lime; set aside for four days with the first, keeping them at a temperature of 80° F.; after which I subjected each to distillation with a little H. Cl.† From the *first* I recovered a considerable amount of butyric acid, but from the second (containing bisulphite) I did not recover a trace. This at once proves that the bisulphites do prevent butyric acid fermentation. Now the object in ascertaining the fact was that a suitable remedy for heartburn might be discovered, as, according to Dr. Leared, this common complaint is due to the presence of butyric acid in the stomach. "On considering the taste," says that gentleman, "experience, as well as the conditions under which heartburn comes on, it seemed to me that the cause of it was the presence of butyric acid;" and from many experiments performed by that gentleman on himself and others by means of the pure acid, symptoms were produced in every respect similar to the complaint itself, so that there can be little doubt but that his theory is a correct one. The very fact that alkalies give relief prove its cause to be from an acid. When the stomach is overtaxed, and in certain weak conditions of digestion, fermentation takes place; butyric acid is set free from the food, *i. e.* it is formed out of its own elements, if the food be of a starchy nature; and, according to Leared "On Imperfect Digestion," page 249, "the acid, by being in excess, but not pure (or it would be soluble), rises to the surface of the contents of the stomach, when it combines with melted fats (for which it appears to have strong affinity); the acrid mixture, on being presented to the cardiac orifice by the motions of the stomach, is instinctively rejected into the œsophagus, and, by the reversal of its proper movement, transmitted to the mouth, accompanied by the sensations of heartburn." Now, as bisulphites have the power of preventing this fermentation, they are well worthy the attention of the profession, but the great drawback is that the chief bisulphite manufactures are those of lime, soda and potash, these being objectionable, as they tend to injure the coats of the stomach. To remedy this failing, thought at once suggested itself to me that a bisulphite of magnesia might be prepared; and magnesia being free from these objections, it may prove a valuable remedy, and is worth notice. I have not seen or heard anything of the preparation previous to my making it. I therefore give a brief outline of the process I adopt, and hope to enter more fully into the subject at a future time. I first treat magnesia carbonate with B. P. sulphurous acid, which,

†For the first two days lactic acid is formed, which combines with the lime, but at the expiration of four days, the lactate of lime is replaced by butyrate of lime, which on being distilled with dilute hydrochloric acid, and the distillate treated with calcium chloride, is dried into two strata, the upper being butyric acid.

on evaporation, yields magnesia sulphite, $Mg\ SO_3$ which is not very soluble in distilled water. I then mix the sulphite of magnesia thus formed with distilled water, in the proportion of 16 grs. to 1 oz., and pass into it sulphurous anhydride until a clear solution is obtained. The result is a solution of magnesia bisulphite.

The dose may be one tablespoonful, containing about nine grains of the salt; its action is a mild aperient antiseptic, preventing butyric fermentation in the stomach, etc. I have tried it myself and on two other gentlemen, and, as far as I can judge, it has the desired effect.

KEITH'S IMPROVEMENT IN NICKEL PLATING.*

The object of this invention is to prepare solutions for depositing nickel by electricity, to be used as a coating to other metals, and which will produce a deposit sufficiently flexible and tenacious for practical use.

The objection to nickel-plated goods thus far has been that the deposit is so brittle that it cannot he bent, nor, on many articles, stand necessary wear if not bent, and that it will also scale or peel off.

All these objections the inventor of the process under consideration claims to have overcome by his improvement, which produces the nickel-plating so elastic, and at the same time adhesive, that it may, he states, be advantageously employed even on the blades of knives or tools.

The nature of the invention consists in adding to the various solutions of nickel, whether formed of single or double salts, materials which, by their presence, prevent the decomposition of the solution of the plating-bath, and the decomposition of oxide of nickel and other impurities upon the articles receiving the coating of nickel.

The greatest care is necessary in the management of the solutions of nickel now used for plating, and in graduating the strength of the electric current to prevent decomposition of the solution, and consequent failure of the deposit. Even with the greatest care of the coating of nickel it is always brittle, and easily cracks and peels off when exposed to usage, on account of decomposition of the solution by the electricity causing the deposit.

For preventing this brittleness and otherwise improving the deposit, there is added to the solution of nickel one or more salts, either single or double, acid or neutral or associated, formed by the union of organic acids, acetic, citric, and tartaric, with the alkalies

* From the Scientific American.

and alkaline earths, ammonia, soda, potassa, magnesia, or alumina. These additions will, it is asserted, counteract the tendency to decomposition of the solution by action of the electric current. The result is a deposit possessing elasticity, toughness, and all the hardness, brilliancy, and other qualities of pure nickel, with the property of adhesion to the article upon which deposited, not possessed by nickel deposited from solutions not containing these additions.

The deposit made is particularly suited to polished steel and iron surfaces—for instance, cutlery and tools—though equally good for all other metallic surfaces.

These various organic acid salts may be added interchangeably and collectively, though the inventor prefers to use, in case of the double salts of nickel and alkalies and alkaline earths, the organic acid salts, which have for their bases the alkali or alkaline earth, which is associated with the nickel in its double salt.

Thus, when using a solution of nickel and ammonia, an organic acid salt of ammonia is preferred, though the similar salts of soda and potash, or soda or potash will answer very well. In case of using a solution of a double salt of nickel and potassa, or double salt of nickel and soda, an organic acid salt of soda and potash is selected.

Of the salts which can be used to accomplish the desired effect, the tartrates are preferable. A comparatively small quantity of the organic salts is necessary to be added, though more will not change the character of the deposit.

The following is an illustration, which the experienced electro-plater can apply to all solutions of nickel. To twenty gallons of a solution in water of the double sulphate of nickel and ammonia, of a gravity of 7° Baume, add about one gallon of a solution of an equal gravity of neutral tartrate of ammonia in water. Mix well, and the bath will be ready after standing a few hours.

More or a little less of the addition does not injure the solution. This solution may be reduced, if necessary, by the addition of solutions of sulphate of ammonia and tartrate of ammonia. The other organic acid salts—namely, the acetates, citrates, and tartrates of the alkalies and alkaline earths—may be used instead with beneficial results.

These solutions may for some purposes be made alkaline by the addition of an alkali—for instance, in the electro-plating of brass and iron, wherein local action would interpose—provided the solution were left in an acid condition.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(Continued from page 319.)

Having made himself thus conversant with the miscropical character of potato-starch, the student should proceed to prepare the starches of sago, tapioca, arum (Portland arrowroot), maize, rice, and wheat. In preparing starch from commercial sago and tapioca, it is needful to be prepared to find the presence of potato-starch and other adulterants. As it fortunately happens that the granules of potato and these other starches differ somewhat widely, the student, with a little care, need not be misled. He will, of course, bear in mind that both sago and tapioca, in their granulated form, have often undergone the application of heat. The starch of tous-les-mois, from its very great size, is so easily recognizable that it hardly requires special comment. If present with other arrowroot, it can immediately be detected by its remarkable uniformity of size, and the greatness of that size. Tahiti arrowroot more closely resembles that of maize than either of the true arrowroots. The East and West Indian arrowroots are to be distinguished from each other by their different sizes, shapes, their "rings," and the position of the hilum. The starch of *Curcuma leucorhiza* (East Indian arrowroot) is described by Schleiden as consisting of "perfectly flat discs, with more distinct layers, in which it is, however, at times doubtful whether they pass entirely round or are only menisci laid one over the other." The West Indian arrowroots are, according to Schleiden, compound granules without evident hilum, "the separate paste granules always exhibiting smooth connective surfaces." Hassall, on the other hand, I think more correctly, says there is a distinct hilum "seen most frequently as a sharp short line running transversely across the granule." The shape of Maranta granule being, according to the latter authority, "more or less oblong and ovate, sometimes mussel-shaped or even almost triangular." If the student make careful drawings of each of the starches we have named, having a sufficient number of each "to give a good average," he will usually be able, by simple examination of a suspected sample of arrowroot, coupled with a glance over his drawings, to say whether or no it is genuine, without the trouble of comparing the known preparation of the suspected adulterant with that under examination. In all cases where there is the least room for doubt, he will, of course, follow the latter plan. The best way of preparing a suspected sample for examination is to sprinkle a little on to a glass slip, and, adding a little glycerine and water, allow it to wait a few moments before covering it with the thin glass, and submitting it to examination. Premising that this

mode, with slight occasional modifications, is to be followed, we will give a list of the various starches and their allies, which are in common use, and their most frequent adulterants, as a guide to the beginner.

Arrowroot.—Cheaper qualities, maize, rice (H.P.); potato, sago, tapioca (Hassall and others). No mineral matter has, so far as I know, been found.

Tapioca.—Sago, potato (Pereira).

Sago.—Potato (Pereira, Pharmaceutical Journal, Vol. III).

Amylum triticum, B. P.—Maize starch; one sample all maize (H.P.).

Oatmeal.—Rice, barley, maize.

Proprietary Foods.—Difficult to say what is an adulteration. Some are exactly what they profess to be. Most are preparations or combinations of the farina of maize, rice, lentils, wheat, and oats. In some the starch only is used, in others the gluten and fibrine are also present. The mode of examination is the same as with arrowroot, with the addition of something to be spoken of later.

Linseed Meal and Wheat-flour.

The former of these was the subject of an able paper, read by Mr. T. Greenish, F.C.S., etc., before the last Pharmaceutical Conference, and printed in the current 'Year Book.' Mr. Greenish has fallen into a few inaccuracies with respect to the relative quantities of linseed imported into England from various foreign ports, but these do not affect the value of the paper and the subsequent discussion as calling attention to the excessive artificial adulteration of linseed-meal and linseed-cake, in addition to what may be called their natural adulterants. I lately had under my notice, at a recent meeting of the Hull Scientific Association, a large collection of seeds and other ingredients commonly crushed with, or added to, linseed for meal and cake. These, called variously sesame, poppy, niger, nut Bordeaux, and otherwise, are dignified with the generic title of Buffum. They are of such diverse character that the best plan for the student to adopt is to make a careful study of the structure of the linseed itself, by carefully dissecting off, with a sharp scalpel and fine needle its *four* coats. A rough and ready way of doing this is to smash a number of the seeds, and carefully examine the débris, but the beginner would scarcely be able to particularize the several coats. The cells of the outer are hexagonal, and contain the mucilaginous matter for which linseed is remarkable. Dr. Hassall says this coat is composed of but *one* layer of cells, but this is at least doubtful, so far as regards some varieties of linum. The cells of the second coat are rounder, and their walls are much thickened with secondary deposits. I am not clear as to the nature of their contents, but they are probably protoplasmic. The

third, very characteristically fibrous or "striated;" and the fourth, of square or oblong cells, containing resinous matter, are tolerably distinct from those of other oil-seeds. The internal structure of the seed does not differ so greatly (as found in meal or cake) from that of many other oil-seeds as to call for special remark. The seeds specially to be guarded against are those of the *Cruciferæ*, possessing irritant properties. The testæ of these differ widely from that of linseed, and a careful study of the seeds of mustard *(Sinapis alba* and *S. nigra*, the testæ of these differ), charlock *(S. arvensis)*, and other common cruciferous seeds will enable their presence to be readily detected. But of course every careful pharmacist will immediately reject any samples of lini farina that are proved to contain a great amount of admixture, without seriously troubling himself as to the harmless or injurious character of its adulterants. Absolutely pure linseed-meal is hardly to be expected, but there ought not to be any difficulty in procuring a practically genuine sample.

The adulterations of wheat-flour are chiefly confined, so far as my observation extends, to the use of barley, oats, maize, and beans. I have never detected mineral matter, nor indeed anything injurious beyond the occasional spores of fungi *(Puccinia, Uredo* and *Ustilago)*. The examination of wheat-flour will follow the same general directions as that of arrowroot, with the addition of testing for mineral matter, if any be suspected. This may very conveniently be done on the stage of the microscope, when the presence of the smallest quantity of lime, in the form of "bone-dust" or "sulphate" may be detected. The process is simply that of applying the usual reagents to a small quantity of the flour whilst it is under view, use of the mixed glycerine and water being omitted, and the reagents applied beneath the covering glass.

I have not found the microscopic examination of bread to be of any great use. The usual chemical process had better be followed if the presence of alum or sulphate of copper be suspected. Potatoes may sometimes be found by aid of the microscope, but not often; rice I think never. Beans and barley may be glimpsed, but "not sworn to."

We have now concluded the easy part of our lesson. For the prosecution of our study some knowledge of minute structural botany is necessary, and may be obtained from the careful study of such books as the English translation of Schleiden's 'First Principles' (Hardwicke), Henfrey's 'Botany' (Master's edition, Van Voorst), Bentley's 'Botany,' and last, but least *only* in size and price, the excellent little manual by Mr. M. C. Cooke (Hardwicke). Young men unembarassed by the cares of business will doubtless follow the thorough course of training necessary to enable them to become good vegetable histologists as a preparation for the duties of the analyst. But many who have the willingness to undergo this course of

study are so occupied with the cares of their businesses and families as to be obliged to content themselves with the smallest modicum of structural knowledge, and may be grateful for a brief outline of the histological characteristics of the various parts of plants made use of in pharmacy or food, so far as sueh characteristics are recognizable in the official preparation or commercial article. These parts are, the underground and aboveground stems, foliar organs (flowers and leaves) and reproductive organs (stamens, fruits, etc.) We will briefly consider them in the order given.

(To be continued.)

NOTES ON THE PHARMACY OF IPECACUANHA.*

BY DYCE DUCKWORTH, M.D., F.R.C.P.,

Assistant-Physician to St. Bartholomew's Hospital.

I have been engaged at intervals for the last three years in studying the physiological and therapeutical actions of ipecacuanha, and consequently have had occasion to employ both the officinal and and other preparations of this drug.† I have likewise made use of its true alkoloid, emetia, as prepared by Messrs. Hopkin and Williams.

The object of my communication to this Society to-night is to call attention generally to the Pharmaceutical preparations of ipecacuanha in the British Pharmacopœia, but most especially to the importance of securing better fluid preparations of the drug than we at present possess.

As to the ordinary powder of the rhizome, I think no remark is called for. I am informed that this is generally to be obtained in the shops void of adulteration, and, provided that the rhizome is of good quality, and is a genuine specimen of ipecacuanha, there is hardly an objection to be made to it. The most probable adulteration is with the rhizomes of *Psychotria emetica*, a striated variety, called Peruvian ipecacuanha. This plant is less rich in emetia, and contains rarely more than 6 per cent., while the best rhizomes of true ipecacuanha yield 10½ per cent. of the true alkaloid.‡ Dr. Attfield has recently § made some assays of different

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, March 6, 1872, and published in the Pharm. Jour. and Trans., March 9, 1872.

† St. Barth. Hosp. Reports, vol. v. 1869, and vol. vii. 1871.

‡ Although Dr. Attfield claims 10 per cent. as the amount of emetia yielded by the best specimen of ipecacuanha, it seems doubtful whether so large an amount is really obtained. There is reason, indeed, to believe that 2 per cent, is about the amount that can be procured from the rhizomes of true ipecacuanha.

§ Sept. 1869, *vide* Pharm. Jour, 2nd Ser. Vol. XI. p. 140.

specimens, and in particular of a variety of *Psychotria*, which was sent from Bogata, and which he found to contain only 2½ per cent. of emetia, with great excess of grape sugar. He rightly urges that no more of this latter quality should be imported into Europe.

It is important to select such rhizomes as are not too broad, for it is found that the bulk of such specimens is mainly due to the central woody matter which is devoid of emetia, and therefore worthless.

Ipecacuanha enters, as you well know, into the following officinal preparations :—Pulv. ipec. co., or Dovers's powder; pil. conii co.; pil. ipec. c. scillâ; trochisci ipecac.; trochisci morphiæ et ipecac.; and the vinum ipecacuanhæ.

I believe that all these preparations are excellent, both as pharmaceutic compounds and for practical purposes. I would especially instance the great value of the Dover's powder, and the pil. ipecac. c. scillâ. It is when we consider the only fluid preparation in the list that we have reason to be dissatisfied with it. It is somewhat remarkable that no other solutions of ipecacuanha have been enjoined in the British Pharmacopœia; in most of the foreign dispensatories there are several formulæ for syrups, liquid extracts, or tinctures.

It is not, however, important to enumerate either the names or the peculiarities of these several preparations, because, with one exception, they cannot be considered satisfactory.

The exception is in favor of the syrup of the United States Pharmacopœia, which is made from an aceto-alcoholic extract of the drug, and this leads me to speak next of the best solvents for ipecacuanha.

These are three in number, viz., acetic and tartaric acids and rectified spirit of wine; they dissolve the emetia out of the rhizome, and there are the best reasons for believing that the alkaloid represents the active principle of the remedy.

In the vin. ipecac. the emetia is dissolved in part by the 17 per cent. of alcohol contained in the sherry, and partly also by the acid tartrate of potassium. Ipecacuanha wine, when freshly made, looks eminently satisfactory as a preparation, but is found to become turbid after a time, and to deposit a brownish, muddy sediment. The same phenomena ensue when a proof-spirit tincture of the drug is made. (A rectified-spirit tincture, such as is used in homœopathic pharmacy, or rather was formerly enjoined in their codex—for they now employ proof-spirit for many of their tinctures —retains its brightness, and throws down no sediment.) This ugly sediment engaged my attention a good deal at one time, and I examined it with some care. I should add that emetia itself dissolves perfectly in sherry, but with some difficulty, and after a time the solution throws down a similar sediment, though in smaller quantity to that found in the wine and proof-spirit tincture. Filtration re-

moves the turbidity, but only for a time. I have learnt from many inquiries amongst pharmacists that some frequently filter the wine, and others dispense the preparation only after shaking up the bottle, and therefore in the turbid state. They have generally seemed ignorant as to the nature of the deposit, though they have believed it to contain some of the active part of the drug.

If some of this matter be examined under the microscope, it will be found to consist of a yellowish, granular, amorphous material. It has been supposed to be glucose or starch; but it is neither the one nor the other. Neither tartaric nor acetic acids have any effect upon it, nor is it dissolved by ether, chloroform, alcohol or ammonia. The only solvent I have found for it is the liquor potassæ. Hence, I satisfied myself that it was not emetia, for this alkaloid is soluble in acids and alcohol, and only slightly so in ether, while it is insoluble in alkalies. The reaction of the precipitate is acid, and it has a bitter and somewhat aromatic taste. I was indeed at a loss to know what its exact nature was till Dr. Attfield informed me that it is a mixture of the acid tartrate of potassium and cephaelate of emetia. To quote his own words, "The cause of its appearance is, I presume, the slow formation of alcohol from the residual sugar in the sherry, a menstruum being produced in which the tartar is decreasingly soluble. With the tartar is deposited the natural salt of the alkaloid, because the former is the solvent of the latter. A proof-spirit tincture is not more stable than ipecacuanha wine; what is wanted to retain the alkaloidal salt in solution being not alcohol but acids, or such an acid salt as cream of tartar." Dr. Attfield stated to me also that the wine deteriorated gradually in strength according to the amount of deposition, which is exactly what might be expected. I find that the addition of 3 or 4 minims of liquor potassæ to a drachm of the muddiest wine or tincture of ipecacuanha renders it quite bright and clear, and of the color of old port wine. Liq. ammoniæ darkens but does not clarify it. The bitterness and aroma of the sediment are due to the ipecacuanhic or cephaelic acid, which is described by Pelletier* as bitter.

There can, therefore, be no doubt that ipecacuanha wine is an unsatisfactory pharmaceutical preparation; and I hold it to be no rejoinder to this statement if either the physician or the pharmacist aver that they are perfectly satisfied with it as it is. For all practical purposes I believe the vin. ipecac. of the shops is quite efficient, but I maintain that there is a better preparation, and that on all accounts it will be proper to employ it. I pass on next to describe what this is. We have already seen that sherry wine is not the best solvent of this drug, and that other menstrua succeed perfectly in taking up the emetia. In November, 1860, a paper was read before this Society by Mr. George Johnson,† a pharmacist of

* Pereira, Mat. Med. vol. ii. part ii., p. 1595.

† PHARMACEUTICAL JOURNAL, 2nd Ser., Vol. II, p. 302.

Birmingham, in which he stated that, while seeking some cheap menstruum for the drug, he found from Pereira's work that acetic acid was the best solvent for emetia, and he proceeded to make an acetic solution according to the formula of the London Pharmacopœia of 1851, then in use. Two and a half ounces of the bruised rhizome were macerated in five fluid ounces of acetic acid. Thirty-five ounces of water were then added, and the maceration was continued for twenty-four hours longer, with frequent shaking. The solution was then filtered and strongly pressed. A rich brown solution was the result; and Mr. Johnson believed this to be nearly twice as strong as the vinum ipecacuanhæ, because, on testing with tincture of galls, after careful neutralization with ammonia, a precipitate of tannate of emetia was thrown down in much larger quantity than fell from an equal amount of the wine after similar treatment. Moreover, fifteen drops of the preparation sufficed to induce vomiting in young children.

Mr. Johnson very properly claimed for this acetum ipecacuanhæ the merits of pharmaceutic exactness and of cheapness, and he urged that this preparation should be introduced into the British Pharmacopœia. His plea for its importance was, however, unheeded by the Committee who superintended that work. Mr. Johnson has also recommended that a weak alcoholic tincture might be employed, which should contain four grains of tartaric acid in the ounce. He proposes that four parts of distilled water should be added to one part of rectified spirit, and this menstruum, with the tartaric acid, he believes, would secure the most stable preparation of ipecacuanha.

I pass on now to describe the process recommended in the United States Pharmacopœia for making the syrup of ipecacuanha. A fluid extract is first prepared by means of acetic acid and alcohol, as follows :—

Take of Ipecacuanha in fine powder..... 16 troy oz.
Acetic acid..... a fluid oz.
Alcohol.
Water, each a sufficient quantity.

Moisten the ipecacuanha with six fluid ounces of alcohol, introduce it into a conical percolator, press it firmly, and pour alcohol upon it until three pints of tincture have slowly passed, or until the ipecacuanha is exhausted. Distil off the alcohol from the tincture by means of a water-bath until a syrupy liquid is left. Mix this with the acetic acid and ten fluid ounces of water, boil the mixture gently until it is reduced to half a pint and the resinous matter has separated. Filter the liquid when cold, and add sufficient water through the filter to make the filtered liquid measure half a pint. Lastly, mix this with half a pint of alcohol.

This process is manifestly a very troublesome and expensive one. The result is a beautiful rich brown-red preparation and very powerful. Messrs. Dinneford & Co. have supplied me with some which they made a year ago, and which appears to retain its full activity unimpaired. The syrup is ordered to be made as follows:—Two fluid ounces of the aceto-alcoholic extract are to be mixed with thirty fluid ounces of simple syrup. This preparation as made by Messrs. Dinneford, I have also examined; and it appears to be a very efficient one. There can be no doubt that, excellent as is the American fluid extract, it is too powerful for ordinary employment, and such a preparation could never take the place of the vinum ipecacuanha, since it would cease to be a household or domestic remedy.

Not long ago it came to my knowledge that Messrs. Ferris and Company, of Bristol, had for some time been accustomed to prepare and sell largely an acetum ipecacuanhæ and an oxymel ipecacuanhæ. I communicated with Messrs. Ferris, and they were so kind as to send me specimens of their preparations and their formulæ for the manufacture of them. They state that they consider the acetum a far more stable and reliable preparation than the vinum, and they supply many medical practitioners with it instead of the latter. It is made by macerating half a pound of the bruised rhizome in a gallon of dilute acetic acid for fourteen days. After expression and straining, the preparation is ready for use. It is a bright yellow solution, and throws down no sediment of any kind.

Messes. Ferris's oxymel is made by mixing one pint of the acetum with two pounds of clarified honey. This must be subsequently evaporated to a proper consistence. The acetum is one-third stronger than the wine; thus twenty minims are equal to half a drachm of the latter, I have employed both of these preparations, and I find that they are excellent and very serviceable.

I am much indebted to my friend Mr. Carteighe, of Messrs. Dinneford & Co., for the trouble he has taken in making several preparations both of the acetum and oxymel. He has recommended the following methods for making these, and it will be seen that they differ somewhat from those employed by Messrs. Ferris. The Pharmacopœial strength of the wine has been maintained both by Messrs. Ferris and Mr. Carteighe, viz., one ounce of the rhizome to a pint of the menstruum.

Take of Ipecacuanha Root (bruised)..... 1 oz.
Acetic Acid..... 1 oz.
Distilled Water, a sufficiency.

Macerate the ipecacuanha and acid for twenty-four hours; pack in a percolator, and pour distilled water gradually over it until one pint of percolate has been obtained.

A clear bright brown solution is obtained, which throws down no sediment. It is darker and stronger than Messrs. Ferris's preparation; and the value of the method consists in the primary action of the stronger acetic acid, which more completely exhausts the rhizome.

Mr. Carteighe's method for making the oxymel is as follows:—

Take of Ipecacuanha (bruised)	1 oz.
Acetic Acid	1 oz.
Distilled Water, a sufficiency.	
Clarified Honey	2 pounds.

Macerate the ipecacuanha in the acid for twenty-four hours, pack in a percolator and pour distilled water gradually over it until ten fluid ounces of percolate have been obtained. Add the product to the honey and mix.

These, then are the fluid preparations of ipecacuanha, which I desire to recommend to the notice of the Pharmaceutical Society.

I believe that they are decided improvements upon any that have hitherto been devised, and meet a want that has long been felt by both medical men and pharmacists. The processes recommend themselves by their simplicity, the preparations are staple and in all respects satisfactory, while the expense is only about half that entailed by employing sherry wine or spirit as ordered in most Continental pharmacopœias.

As to the doses of acetum and oxymel, I have prescribed the former in doses varying from five to fifteen minims, and am quite satisfied with the effects. I secured an emetic action with half an ounce in the case of an adult. The oxymel may be employed in doses of from five minims to half a drachm, and continued or not according to the effect produced. I have elsewhere advised that small doses of ipecacuanha are best given frequently for the so-called expectorant or relaxtant effect.

Many medical men prescribe the wine with alkaline remedies, and might hesitate to order an acetum ipecac. in such combin. tion. In either case there is a chemical incompatability, though, as in the case of hyoscyamus and alkalies, practitioners will doubtless express themselves as satisfied clinically with the result. Again, the wine does not mix well with the emulsion of almonds, although this is often ordered for children. The oxymel, however, will make a very pleasant and palatable mixture in combination with mistura amygdalæ.

It may be and probably will be, a difficult matter to displace the well-known and reputed ipecacuanha wine from the Pharmacopœia; and, for my part, I am not disposed to urge such a course at the present time. Were the medical profession to cease to employ it, the public would continue to demand it as a common and domestic remedy. If, however, the two preparations I have described, the

acetum and the oxymel, be added to the Pharmacopœia, and the vinum be retained for the present, the requirements of chemistry and modern pharmacy will be satisfied, and the physician will be furnished with the best known fluid forms of the drug; while the public will find in the shops, as heretofore, their old fashioned remedy unchanged.

Editorial.

TRADE IN MEDICAL DIPLOMAS.

The possession of a charter granted by the legislature of a country or state is generally supposed to be some guarantee for the genuineness and respectability of an institution so endowed. In the case of medical colleges this warranty is held by the public as being amply sufficient to insure the necessary protection, and medical practitioners, holding degress from such institutions, are at once admitted to the enjoyment of that confidence to which their position and antecedents entitle them. It is true that there are persons of hypercritical and suspicious dispositions who view medical or scientific titles with a certain amount of suspicion until they are exactly informed as to their source. As a general rule, however, the public are quite content to accept the possession of a legally obtained diploma as adequate security against the advances of empiricism and quackery.

This popular belief has lately received a severe shock from the investigations of a committee, appointed by the Legislature of Pennsylvania, to enquire into certain workings of the medical colleges of that State. From the report of the committee it appears that impositions of the grossest description have been perpetrated under the very charters granted by the State, and that the trade in medical diplomas and honors has been carried on to an extent which is without precedent. The United States, Great Britain, and we doubt not Canada, too, have been flooded with degrees of all sorts, without lack or descrimination. From the evidence submitted to the committee it was incontestably proven that two of the State colleges were engaged in this traffic. The names of these institutions are the Philadelphia University of Medicine and Surgery

which is under the management of Dr. W. Payne; and the Eclectic Medical College, presided over by Dr. John Buchanan. With regard to the first of these institutions it was shown that Dr. Payne made an agreement for the sale of diplomas, for the consideration of $200, conferring the degrees of M. D. and LL. D. to a person of whom he knew nothing except the name, and that in pursuance of this arrangement diplomas were regularly made out and signed. The person named in this instance is stated to have been an infant but two years old. It was also proved that Dr. Payne entered into an agreement with other parties to furnish diplomas for sale. In many instances there was positive proof that he had issued the diplomas of the Philadelphia University of Medicine and Surgery, for a consideration, to persons who had never attended any course of instruction, and to others who had only attended a few lectures in the course, and almost invariably without requiring an examination of the person so graduated, or the writing of a thesis.

The facts in regard to the Eclectic Medical College were even more scandalous. The traffic was carried on openly and systematically. Diplomas, in regular form, and signed by the faculty were granted to women who could not even tell the locality of the college, and a regular traveller was employed to find out the residence of practising quacks for the purpose of supplying them with the necessary documents for whatever sum could be obtained.

These diploma shops have done great injury to the reputation of two well-known and most respectable colleges—the University of Pennsylvania and the Jefferson Medical College, which are located in Philadelphia, and which through similarity in name and place have been confounded with them. It appears to have been the especial care of Drs. Payne and Buchanan to foster this belief and lead unsuspecting persons to think that they had really formal connections with these colleges; the similarity of the name was doubtless arranged with this end in view.

It will be gratifying to all honest men to learn that measures to repeal the charters of these rascally concerns were laid before the legislature by Mr. Randall, chairman of the committee, and passed by a unanimous *viva voce* vote.

The cause of Eclecticism in Canada suffers a severe loss by the downfall of these their pet colleges, and we have the greatest pleasure in extending to the fraternity our deepest sympathy in their bereavement.

TO MEMBERS OF THE ONTARIO COLLEGE OF PHARMACY.

It is now just four years since this journal made its first appearance as the representative of Canadian pharmacy. However modest its pretensions at the outset, there is every reason for congratulation at the progress made, not only as regards the size, appearance, and circulation of the JOURNAL itself, but in the influence it has exerted towards the establishment and organization of the present College. Although deriving encouragement from this, we feel compelled to say that, in some other respects, our feelings have been very different. Year after year the hope has been cherished that our task would cease to be a solitary one, but for the honor of Canadian pharmacy we blush to say that we still have to work alone, or almost alone. During the past year we have not received a solitary paper from any member of the College. Any assistance that has been given has been from outside sources. This is surely discouraging enough, especially when we glance at the pages of journals published under like auspices. Many of our exchanges are the organs of institutions much younger and less pretentious than the Ontario College of Pharmacy, and are published in States and Provinces, to which, in point of age, Canada is patriarchal. Yet these papers are teeming with the evidence of life, and overcrowded with contributions, while this journal is returned without any sign from which its national pharmaceutical existence could be deciphered, save such as comes from the editor's pen.

We have tried in vain to find a satisfactory and creditable reason for this very unsatisfactory and discreditable state of things. That it arises from a deficiency of talent we cannot admit, but would rather assign it to an exclusive attention to individual interests, to the neglect of those which affect the general community. If this spirit was manifested by pharmacists of other nationalities, our progress would be very slow indeed. It is the *duty* of every one to contribute his share, and we hope that the apathy of which we complain will be manifested no longer, but that our national reputation will be saved from further reproach.

MRS. WINSLOW AGAIN IN DIFFICULTIES.—Three cases of poisoning by Mrs. Winslow's Syrup are reported in the medical journals. One of them occurred at Wandsworth, in England. The particulars of the case are not given, but it appears that the circumstances were such that an inquest was held on the subject—a child of two years of age. It was stated by the attending physician that the child had been suffering from cerebral disease, but that death was evidently caused by an overdose of the syrup. A verdict was recorded in accordance with this statement. The other cases are reported in the Pacific *Medical and Surgical Journal*. Dr. McNutt, of San Francisco, was called to see a child five months old, and found it suffering from the effects of morphine. On inquiry he learned that the mother had been giving soothing syrup, in teaspoonful doses, several times a day, for two or three successive days. Brandy and coffee were administered, and under this treatment the child recovered. In another instance Dr. McNutt's partner was called to see a child five months old, to whom nearly a teaspoonful of soothing syrup had been given a few hours previous. The child was past all help, and died in a few hours. No other medicine had been given.

The evidence in regard to Mrs. Winslow's syrup is somewhat contradictory, although in the cases cited above it is certainly to the point. However, some three years ago we published, in this Journal, an account of a similar case, which called forth a communication from a Toronto correspondent, who stated that one of his daughters—a child of three years of age—had obtained surreptitious possession of a full bottle of the syrup, and having disposed of its entire contents, was discovered washing out the last remains of sweetness from the bottle. The little girl sustained no injury, and from this our correspondent rightly concluded that if the syrup contained morphia, it must certainly be in such a homœopathic quantity as to be incapable of effect, either for good or evil. In the face of these statements, we can only form one conclusion—that some samples of the syrup contain morphine while others do not. Whether this arises from want of care in the preparation of the nostrum; or whether there are imitations in the market, it is impossible for us to say. From the fact that frequent cases of poisoning are reported on the Pacific coast, while on this side of the continent, our youngsters take the syrup as a beverage, it does not appear improbable that the western trade is supplied with a dangerous imitation.

Editorial Summary.

NEW METHOD FOR PREPARING LIN. SAPO.—J. A. Graefle, *(Am. Jour. Pharm.)* proposes the following modification of the U. S. process yielding a clear liniment in the course of a few minutes.

Dry White Castile Soap (finely grated),	℥iv.
Camphor,	℥ij.
Oil of Rosemary,	fl℥ss.
Water,	fl℥vj.
Alcohol,	fl℥xxx.

Put the soap in a half-gallon bottle, pour on a pint of alcohol, shake well, add the water and shake again till the soap is dissolved. Dissolve the camphor and oil in the remaining alcohol, mix the two solutions and filter.

SOLUBILITY OF BISULPHIDE OF CARBON IN WATER.—F. Sestini *(Gazet. Chim. Ital. in Jour. Chem. Soc.)* states that carbon bisulphide is not quite insoluble in water. After several days contact at ordinary temperatures, water takes up about one part in 1000 of its weight of this compound, a very small quantity at the same time undergoing decomposition. The aqueous solution, when distilled, gives up the carbon bisulphide unaltered, at the commencement of the distillation. It has the odor of the compound, a slight burning taste, and does not contain more than 0.002 gram of hydrogen sulphide in a litre. With regard to reactions with the hydrates of the alkaline earth, it is said that when a mixture of water, calcium hydrate and carbon bisulphide is exposed to the action of solar light in summer, the liquid in six or eight hours acquires a fine yellowish-red color, and during the following night deposits a few very fine prisms of orange-red color. The same reaction takes place in two hours when carbon bisulphide is heated to about 50° with milk of lime. The liquid, filtered while hot, does not deposit any crystals on cooling, but, on adding calcium hydrate to the cooled filtrate, it yields the prismatic crystals above mentioned. These crystals consist of a compound of hydrate and sulphocarbonate of calcium.

Transactions of Pharmaceutical Colleges and Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

The election of officers of the College took place at the annual meeting held March 25th, the following gentlemen were elected:—

President, Dillwyn Parrish.
1st Vice-President, William Procter, Jr.
2nd Vice-President, Robert Shoemaker.
Treasurer, Samuel S. Bunting.
Recording Secretary, Charles Bullock.
Corresponding Secretary, Alfred B. Taylor.
Editor, John M. Maisch.
Librarian, T. S. Wiegand.
Curator, Jos. P. Remington.

The ordinary meeting of the College was held a week previous to the above. We extract the following interesting particulars from the Journal of the Society.

Prof. Parrish presented, on behalf of Cramer & Small, a specimen of fixed oil obtained from 15 pounds of Nux Vomica, in the process for making the alcoholic extract; the weight of the oil was two and a half ounces, that of the extract, after its separation, 18 ounces. The oil was of a dark brown color and very bitter in taste. Prof. Maisch remarked that he had not separated the oil in making this extract on a large scale, on account of its bitterness, but that by mixing the tincture, concentrated by evaporation to a syrupy consistence with a little water, and evaporating—as recommended some years ago, in some pharmaceutical journals—it may be almost completely mixed throughout the mass. It was further remarked that no directions for its separation are given in the Pharmacopœia.

Prof. Parrish exhibited specimens of vaginal suppositories made of Mr. Brady's material, consisting of 3 p. gelatine, 7 p. glycerin and 1 p. alcohol. The gelatine was first heated up with a small quantity of water till dissolved, the glycerin and alcohol added, and evaporation continued.

Prof. Maisch raised the question, What is colts' foot root? to which reply was made, that such a synonym is applied to Asarum Canadense, owing to the imagined resemblance of the leaves of that plant to a horse's hoof.

Prof. Maisch exhibited oil of Eucalyptus globulus, said to be used for adulteration of other volatile oils; it has a delicate odor, easily covered by bergamot and more powerful perfumes. The tree is indigenous to and abounds in Australia, especially in the more healthful parts of that island. As a shade tree it is cultivated in Southern Europe; the leaves yield six per cent of the oil. The price of the oil in commerce is about $1.50 to $2.00 per pound. Also a specimen of Gurjun Balsam, or wood oil, obtained from several species of Dipterocarpus, indigenous to the East Indies, which is used in England and Germany for the same uses as Copaiba, which it resembles in odor, though dark and opaque, and having a bitter taste; at 230° to 260° it becomes thick and almost gelatinous—above that temperature is limpid.

After the usual opportunity for conversation, the meeting adjourned.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

The regular meeting was held March 6th, Mr. Haselden in the chair. After the announcement of donations, and remarks thereon, Mr. Williams made some observations on specimens of croton-chloral, and syrup of lacto-phosphate of lime and syrup of lacto-phosphate of iron which were exhibited to the meeting. Mr. Williams' remarks, as well as those that follow, are abstracted from the report in the *Pharmaceutical Journal*.

Mr. Williams said that the specimens seemed to be very nice and elegant forms of medicine, although he thought they were rather weak, 2 per cent being prescribed instead of 2 grains in a drachm, which was the common form in the English syrups. He thought they might be very useful. With regard to the croton chloral hydrate, he might say that it was the chloral hydrate of another series; it was the chloral hydrate of crotonic acid, just as the ordinary chloral was the product of acetic acid. It was obtained by passing chlorine through pure aldehyde, and was said to act upon the system perfectly as a narcotic, but not as a stimulant to the heart, and the heart's action was not in any way interfered with. If that were the case, it would be of great importance. It was very soluble in hot water, and but slightly soluble in cold water. In both ether and alcohol it was freely soluble. It was destroyed by strong and boiling sulphuric acid, turning black and envolving hydrochloric acid, in which it differed from ordinary chloral. The dose was about the same as that of ordinary chloral, but not quite so much—not more than 20 grains. Dr. Liebreich, of Berlin, had written upon this subject, and it was entirely upon his authority that he (Mr. Williams) made the statement as to its medicinal qualities.

Xyloi had been introduced as a remedy for smallpox. It was the third member of the benzole series; it boiled at 139 Centigrade. It formed a double compound with sulphuric acid, and had many points of interest. The dose was from 5 to 15 drops. The effects following its administration were said to be that the pustules were dried over, and the pitted appearance of smallpox removed.

Dr. Dyce Duckworth then read a paper on "Pharmaceutical Preparations of Ipecacuanha."

[This paper is printed at p. 360, and elicited the following discussion:—]

The President said he perfectly well remembered the paper of Mr. Johnson's in 1860, which Dr. Duckworth had spoken of, and also that the subject was discussed by the Chemical Discussion Association of the Society. He believed they came to the conclusion that the acetic preparation was the best that could possibly be obtained, and that the bulk of the precipitate was acid tartrate of potash, but why the matter remained in abeyance and the framers of the Pharmacopœia did not take it up, he could not understand.

Mr. Hills said that Dr. Duckworth's paper opened rather a new question with respect to wines. The wines of commerce varied so much that he would suggest whether proof-spirit could not be substituted for them, so that they might have something definite as a menstruum. Why the wines of the Pharmacopœia should have remained so long in use, was a subject worthy of consideration for the next Pharmacopœia. It was a question whether they should not do without wines, and substitute alcohol with water in the best proportions for the purpose required. He felt very much indebted to Dr. Duckworth for bringing this subject forward; and

he thought that the acetum ipecacuanhæ and the oxymel would recommend themselves to the notice of the profession by whom they would be found very serviceable.

Mr. Hanbury said the course that Mr. Hills suggested had actually been tried, for in the Pharmocopœia of 1824 wines were abolished. Steel wine, antimonial wine, colchicum wine and ipecacuanha wine, made with sherry, were all abolished; but he believed the result was a failure, for in the next edition of the Pharmacopœia the wines were restored.

Mr. Williams remarked that in making emetia they were very careful not to bruise the root, but used it whole. The preparations before them were made with bruised roots, but he thought bruising the root was rather a disadvantage than otherwise. They sliced it into small pieces, and did not allow that starchy matter that would otherwise come out to get into the preparation.

After a lengthened discussion on the modes adopted for the assay of the ipecac, and the liability of the root to adulteration, a paper by Dr. J. E. De Vry, on *Cinchona caloptera*, was read and the meeting was brought to a close.

Practical Formulæ.

Diamond Cement.—

Isinglass, soaked in sufficient water to render it soft, is dissolved by the aid of a gentle heat, in as small a quantity of acetic acid as possible. In each ounce of this solution dissolve 5 grains of ammoniacum, and add a solution of 15 grains of mastic, previously dissolved in 90 minims of alcohol, 65 o.p. Mix well together.

Remedy for Freckles.—

Sulpho-carbolate of zinc	2	parts.
Glycerin	25	"
Rose Water	25	"
Alcohol	5	"

Dissolve and mix.

This lotion is to be applied to the skin twice daily. In half an hour it should be washed off with cold water.

Verbena Water—A good article may be made in the following way:—

Take Rectified spirit	1	pint.
Grass-oil (verbena-oil)	3	drachms.
Oil of lemon peel	2	ounces.
Oil of orange-peel	½	ounce.

Mix; let it stand for a few hours, filter if necessary and fill in bottles. A very much superior article, also sold in commerce under the name of *Extrait de Verbène*, is made according to the following recipe:

Take Rectified spirit	1 pint.
Oil of orange-peel	1 ounce.
Oil of lemon-peel	2 ounces.
Oil of lemon	1 drachm.
Grass-oil (verbena-oil)	2½ drachms.
Essence of orange-flowers	7 ounces.
Essence of tuberose	7 "
Essence of rose	½ pint.

Silvering Glass.—The fluid for silver-plating glass consists essentially of two liquids, one being an ammoniacal solution of nitrate of silver, and the other a tartrate or other similar salt. These are mixed before application and poured over the glass plate or into the glass vessel, when the silver salt will become decomposed, metallic silver being deposited. When this has acquired the desired thickness, the rest of the fluid is poured off, the plate washed with pure water and dried. The solutions are prepared according to the following formula:—

Take Nitrate of silver	2 ounces.
Water	3 fl. "
Rectified spirit	3 fl. "
Dissolve and add	
Liquor ammonia	1 fl. ounce.

After letting the mixture stand for a short time filter and add to each ounce of it

Grape sugar	¼ ounce.

previously dissolved in a mixture of

Water	½ pint.
Rectified spirit	½ "

After three or four hours' repose, filter, and apply to the surface of the glass, which should be warmed to about 160°F.

Selections.

A New Form of Sensitive Flame.—At a recent session of the Polytechnic Association, Prof. S. D. Tilman gave a brief account of a new method of making sensitive flame, which was devised by F[illegible]p Barry, of

Ireland, who writes that the method of producing the flame consists in igniting the gas (ordinary coal gas), not at the burner, but some inches above it, by interposing a bit of wire gauze between the burner and the flame. The piece of wire gauze (32 meshes to the inch) is supported about two inches above the gauze. On turning on the gas and lighting it above the gauze, a flame is obtained in the shape of a slender cone, four inches high, the upper part giving a bright yellow light, the base being a non-luminous blue flame. At the least noise the flame roars, at the same time flattening itself upon the gauze and becoming almost invisible. It is very active in its responses; and, being rather noisy, appeals to the ear as well as the eye. This flame does not appear to distinguish the vowel sounds as well as the vowel flame proper. To A it is extremely sensitive, less so to I, but slightly sensitive to E and U; and O has no influence upon it whatever. To the sounds coming from a small music box, it dances in a most perfect manner, and is highly sensitive to most of the sonorous vibrations which affect other flames.

GLYCERIN INTENDED TO PRESERVE LYMPH.—For the preparation of a good and durable glycerin-lymph pure glycerin is absolutely required. The glycerin sold by apothecaries, even if it shows the properties prescribed by the Pharmacopœia, is not always pure, and the customary tests for its purity not always sufficient, and only by Hagar's investigations are we enabled to distinguish between a mild, and for medicinal use, suitable glycerin, and an article possessing irritating qualities. When equal volumes of rectified sulphuric acid sp. gr. 1·83 and commercial pure glycerin are mixed in a test-tube, an increase of temperature takes place—a simultaneous faint or light brown color of the mixture appears but seldom. The mixture is clear, and only a few air-bubbles are noticed on account of shaking. A glycerin behaving in this manner is mild and suitable for medicinal use. The irritating, and therefore unsuitable kind, shows a decidedly different behaviour, for at the moment of coming in contact with the acid an evolution of gas takes place similar to the disengagement of carbonic acid in a clear liquid. After escape of the gases and the rest of the liquid, evolution begins anew on shaking the mixture, and may be repeated several times. One kind of glycerin shows a stronger disengagement of gases than the other. Out of 100 gm. glycerin Hager obtained about 6 cubic centimr. gas, which closer examination proved to be carbonic acid and carbonic-oxyd gas. Since after the removal of the CO_2 by means of KaO, HO somewhat more than one-half of the CO remained, it would be assumed that in this irritating kind of glycerin an oxalate and a small quantity of formiate were present. The oxalic acid was proved by the fact that a not too small sample of the glycerin being boiled with a solution of chloride of calcium and aqua ammonia, turned turbid and showed a sediment of oxalate of lime. The former acid was proved in a cold mixture of glycerin and solution of silver, left standing for some time, by the reduced and black precipitated silver. Some of the irritating kinds of glycerin contained, besides oxalic acid, strong traces of ammonia, and were found, on enquiry, to have been purified by chemical means, whereas, the milder kinds were all purified by distillation. All were indifferent to litmus paper, It is therefore, necessary to use, in medicine, only glycerin which has been purified by distillation.—*Wittstein's Viertel. in Pharmacist.*

HAGER'S TANNIN-TEST FOR ALCOHOL IN OIL OF PEPPERMINT.—The adulteration of this oil with alcohol amounting to but 0·5 is shown by this

test, noting the length of time, which is from two to three hours. An oil, for instance, containing one half per cent. of alcohol, will indicate the latter in the course of 1½ hours; 10 to 15 drops of it are placed in a dry test-tube, tannin, in the form of lumps, or in powder, the size of a pea is added, mildly shaken, and set aside. If during the time mentioned the tannin remains unchanged, does not become sticky, soft and smeary, the oil is shown to be free from alcohol.

This process is more reliable than Puscher's fuchsin-test, because this dye is also soluble in oils slightly oxidized, and if the oil is not entirely colorless will indicate only down to from two to five per cent.; besides, the red color of the anilin produced by alcohol contained in oils having a greenish, bluish or blown color, is covered completely with the latter; and therefore lost and valueless as a test. It may be here remarked that a small admixture of alcohol forms a very valuable preservative for this oil, for an oil of pepperment, mixed with but ½ per cent of alcohol will resist oxidation ten times longer than if kept on hand pure.—*Ibid.*

Poisoning by External Application of Remedies.—Dr. S. S. Keene reports, in the Boston *Medical and Surgical Journal*, (February 1, '72,) a case of poisoning from the external application of the following compound:

R Tinct. Rad. Aconiti
Tinct. Opii aa ℥ ss.

M.

This was applied to the face by rubbing with the fingers of the right hand. One half hour afterwards the patient was seized with dizziness, nausea, dimness of vision, cephalgia, pain in the back, with sensation of coldness running along the spine, partial loss of motion of lower extremities, with cramps and prickling sensation, and coldness in legs and feet. On examination, no abrasions were found on the face, but the index finger of the right hand had a slight wound. He was treated with ammonia and chloroform; in four hours the intensity of the symptoms had diminished, and at the end of twenty-four hours they had entirely disappeared. —*Pharmacist.*

BUSINESS MEMORANDA.

Mr. W. T. Bray, formerly of Dingle, has commenced business at Wingham.

Mr. William Bray, of Bothwell, has commenced a new business at Petrolia.

Mr. E. W. Poussett, Sarnia, has removed to a new store, nearly opposite his former place of business.

Mr. W. H. Dale, of Petrolia, has erected a new store into which he has removed.

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 12 @	0 14
Benzoic, pure	0 25	0 35
Citric	1 10	1 15
Muriatic	0 04	0 06
Nitric	0 11½	0 15
Oxalic	0 35	0 35
Sulphuric	0 03¾	0 07
Tartaric, pulv	0 50	0 50
Ammon, carb. casks	0 21	0 22
" jars	0 21	0 22
Liquor, 880	0 20	0 25
Muriate	0 12½	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 27	0 30
Sulphuric	0 45	0 50
Antim. Crude, pulv	0 13	0 17
Tart "	0 50	0 55
Alcohol, 95 per ct.....Cash	1 60	1 72
Arrowroot, Jamaica	0 18	0 22
Bermuda	0 45	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 35	0 35
Copaiba	0 77	0 80
Peru	4 00	4 20
Tolu	0 90	1 00
Bark, Bayberry, pulv	0 18	0 20
Canella	0 17	0 20
Peruvian, yel. pulv	0 42	0 50
" red "	2 10	2 20
Slippery Elm, g. b	0 15	0 20
" flour, packets	0 28	0 32
Sassafras	0 12	0 15
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	18 00	19 00
Bismuth, Alb	4 00	5 00
Carb.	4 00	5 00
Camphor, Crude	0 38	0 40
Refined	0 50	0 55
Cantharides	2 90	3 00
Powdered	3 00	3 10
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 20	0 30
Chloroform	1 25	1 65
Cochineal, S. G	0 80	0 95
Black	1 10	1 20
Colocynth, pulv	0 50	0 60
Collodion	0 67	0 70
Elaterium.....oz	4 50	5 00
Ergot	0 65	0 75
Extract Belladonna	2 20	2 50
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	1 12	1 25
Henbane, "	1 70	2 00
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic.....oz	0 60	0 70
Opium.....oz	1 10	—
Rhubarb	7 50	—
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	3 25	3 70
Taraxicum, Ang	0 70	0 80
Flowers, Arnica	0 25	0 35
Chamomile	0 30	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 42	0 50
" Cape	0 12	0 20
" " powdered	0 20	0 30
" Socot	0 76	80
" " pulv	0 90	00
Arabic, White	0 60	0 65
" " powdered	0 50	0 55
" sorts	0 28	0 30
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 31	0 35
British or Dextrine	0 13	0 15
Benzoin	0 48	0 55
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 32	0 40
Gamboge	1 05	1 20
Guaiacum	0 38	0 78
Myrrh	0 42	0 60

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	0 70
Scammony, powdered	6 50	6 75
" Virg. "	14 50	—
Shellac, Orange	0 50	0 52
Gum, Shellac, liver	0 43	0 45
Storax	0 65	0 75
Tragacanth, flake	1 10	1 40
" common	0 35	0 40
Galls	0 27	0 32
Gelatine, Cox's 6d	1 10	1 20
Glycerine, common	0 30	0 35
Vienna	0 30	0 40
Prices	0 60	0 75
Honey, Canada, best	0 15	0 17
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon	1 10	1 20
" & Quinine, oz	0 56	0 60
" & Strychine "	0 17	0 25
Sulphate, pure	0 08	0 10
Iodine, good	14 00	—
Resublimed	16 25	—
Jalapin	1 40	1 60
Kreosote	1 60	1 70
Leaves, Buchu	0 25	0 30
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 30	0 60
" E. I.	0 12½	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 15
Lime, Carbolate.....brl	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12½
Lead, Acetate	0 14	0 15
Leptandrin.....oz.	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 75	2 00
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 17	0 20
Calcined	0 65	0 75
Citrate.....gran.	0 40	0 50
Mercury	1 00	1 15
Bichlor	1 00	—
Chloride	1 15	—
C. Chalk	0 60	—
Nit. Oxyd	1 20	—
Morphia Acet	3 65	4 00
Mur.	3 65	4 00
Sulph	3 80	4 20
Musk, pure grain.....oz	21 00	—
Canton	0 90	1 20
Oil, Amonds, sweet	0 50	0 52
" bitter	14 00	15 00
Aniseed	4 25	4 50
Bergamot, super	5 75	6 00
Carraway	4 00	4 20
Cassia	2 20	2 50
Castor, E. I	0 15	0 15
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 10	1 50
Cloves, Ang	1 15	1 30
Cod Liver	1 20	1 50
Croton	2 00	2 10
Juniper Wood	0 80	1 00
Berries	6 00	7 00
Lavand, Ang	16 00	17 60
Exotic	1 40	1 60
Lemon, super	5 75	6 00
ord	2 20	3 40
Orange	4 00	4 25
Origanum	0 65	0 75
Peppermint Ang	13 00	14 40
" Amer	3 25	3 50
Rose, Virgin	6 50	7 00
" good	5 00	5 50
Sassafras	1 25	1 50
Wintergreen	5 50	6 50
Wormwood, pure	6 00	6 50
Ointment, blue	0 76	0 80
Opium, Turkey	6 50	6 75
pulv	9 00	10 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass.	0 80	0 85
Potash, Bi.chrom	0 25	0 27
Bi-tart	0 30	0 32
Carbonate	0 14	0 20
Chlorate	0 55	0 55
Nitrate	10 50	11 00
Potassium, Bromide	1 60	1 75
Cyanide	0 75	0 80
Iodide	11 75	0 00
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	50	—
Houghton's doz.	5 00	9 00
Morson's oz.	1 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 25
Howard's	2 35	—
" 100 oz. case.	2 35	—
" 25 oz. tin..	2 30	—
Root, Colombo	0 15	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 25	0 35
Elecampane	0 14	0 17
Gentian	0 10	0 12½
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	2 20	2 30
Jalap, Vera Cruz	1 35	1 60
" Tampico	0 90	1 00
Liquorice, select	0 11	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	3 50	—
" E. I.	1 10	2 00
" " pulv	1 40	2 50
" " 2nd	1 30	1 50
" French	0 75	—
Sarsap., Hond	0 40	0 45
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	0 70	1 80
Spigel	0 40	0 45
Sal, Epsom	2 25	3 00
Rochelle	0 30	0 35
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 05	0 06
Cardamom	3 50	2 00
Fenugreek, grd	0 03	0 10
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	2 00	2 50
Spanish	17 00	18 00
Sanguine	9 00	10 00
Sago	0 07½	0 09
Silver, Nitrate Cash	14 85	16 50
Soap Castile, mottled	0 10	0 14
Soda Ash	0 03	0 05
Bicarb. Newcastle	6 00	6 25
" Howard's	0 14	0 16
Caustic	0 05¼	6 00
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 20	2 50
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 75	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
Analine, Magenta, cryst	3 00	4 00
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09	0 10
Camwood	0 06	0 09
Copperas, Green	0 01½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02½	0 04
Indigo, Bengal	2 40	2 50
Madras	0 95	1 10
Extract	0 28	0 35

DYESTUFFS—*Continued.*		
Japonica	0 05½	0 06½
Lacdye, powdered	0 33	0 38
Logwood	0 02	0 03
Logwood, Camp	0 02	0 3½
Extract	0 10	0 14
" 1 lb. bxs	0 14	—
" ½ lb. "	0 15	—
Madder, best Dutch	0 16	0 17
2nd quality	0 15	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 8½@	0 10
Cassia	0 38	0 40
Cloves	0 12½	0 15
Cayenne	0 18	0 25
Ginger, E. I.	0 12	0 14
Jam	0 20	0 30
Mace	1 45	1 50
Mustard, com	0 20	0 25
Nutmegs	1 05	1 10
Pepper, Black	0 19	0 20
White	0 35	0 36
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 25	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 10	0 15
Umber	0 07	0 10
Vermillion, English	1 20	1 25
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen	0 08	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
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 03½	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 30	—
" No. 1	2 10	—
" No. 2	1 90	—
" No. 3	1 65	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	5 50 @	5 60
Rosin, Strained	5 25	5 25
Clear, pale	9 00	10 00
Spirits Turpentine	1 00	1 05
Tar Wood	5 00	5 25
OILS.		
Cod	0 60 @	0 62
Lard, extra	1 00	—
No. 1	0 95	1 00
No. 2	0 85	0 90
Linseed, Raw	0 79	0 80
Boiled	0 84	0 85
Olive, Common	1 15	1 35
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 60	3 90
Seal Oil, Pale	0 75	0 80
Straw	0 70	0 75
Sesame Salad	1 30	1 35
Sperm, genuine	2 35	2 40
Whale, refined	0 90	0 95

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