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Original and Selected Papers.

SYRUPS CONTAINING PHOSPHORIC ACID.*

BY SILAS DANIEL.

The difficulty of preparing chemical food according to the formula published in Parrish's "Practical Pharmacy" is well known. The phosphate of lime is only partly soluble; the strict operator is puzzled to know how much the syrup should measure when completed. He probably thinks that he has solved the difficulty when he finds in the description of the syrup that each teaspoonful contains "about" 1 gr. phosphate of iron, and 2½ grs. phosphate of lime. Beginning with the lime phosphate, he finds that to agree with the description, the syrups should measure 36 fluid ounces. Attempting to check these figures, he calculates the quantity of ferrous phosphate produced—supposing all the iron to be utilized, which, as will be shown, is not the case—he finds that if he makes 36 fl. ozs. of syrup, each fl. drachm will only contain ·894 of a grain of phosphate of iron. As is now shown in recent works on elementary chemistry, when phosphate of soda and sulphate of iron are mixed together, sulphuric acid is liberated, $2Na_2HPO_4 + 12H_2O + 3FeSO_4$, $7H_2O = Fe_3P_2O_8 + 2Na_2SO_4 + H_2SO_4$, which would dissolve a portion of the newly formed phosphate.

Again, can a syrup be made to contain 40 ozs. (apothecaries') of sugar, besides several kinds of phosphates and acids, and be limited to 36 fl. ozs. and have all its constituents in solution? It is

*Read at the meeting of the British Pharmaceutical Conference, and published in the Pharm. Jour. & Trans.

palpably impossible. Neither is the difficulty removed by using phosphate of lime, made by double decomposition from chloride of calcium and phosphate of soda, and a smaller quantity of sugar. The phosphate readily dissolves in the acid, forming a strong solution; but immediately sugar or syrup is added, in spite of a liberal use of hydrochloric acid, a gelatinous precipitate is the result.

An elegant syrup, of definite composition, and which keeps fairly well, may be made by using tribasic acid. The method I adopt is as follows:—

Syr. Ferri Phosph. Co.

Sulphate of Iron	671 grains.
Phosphate of Soda	2503 "
Acetate of Soda	222 "
Chloride of Calcium	585 "
Carbonate of Soda	40 "
Carbonate of Potash	60 "
Cochineal	120 "
Phosphoric Acid syrupy sp gr 1·5	30 fl. drachms.
Sugar.	24 ounces.
Orange Flower Water . . .	1 "

Dissolve the sulphate of iron in 3 ozs. and the acetate and 600 grains of the phosphate soda in 8 ozs. warm distilled water. When quite cold, mix the two solutions, and, after careful stirring, wash the precipitate, by means of decantation, with distilled water, and collect on a filter. Dissolve the chloride of calcium in 1 oz., and the remainder of the phosphate in 17 ozs. warm distilled water. When cold mix the two solutions, wash by decantation, and collect on a calico filter. After draining submit the precipitate to strong pressure. Dissolve the two precipitates in the acid. To the solution add the carbonates, which should first be rubbed down in a mortar with a few drops of distilled water.

The cochineal having been reduced to a very fine powder, is mixed with the sugar and 13 ozs. of distilled water, and the whole raised to the boiling point. Strain through flannel, and when quite cold add the orange flower water, the solution of phosphates, and distilled water, if necessary, to make 36 fluid ounces.

By boiling the sugar and cochineal a bright syrup of rich colour is produced. It contains 1 gr. phosphate of iron, 2½ grs. phosphate of lime, and fractions of grains of phosphates of soda and potash and acid equal to about 35 min. acid. phos. dil. B.P. in each fluid drachm. Sp. gr. 1·308.

The difficulty of keeping unchanged syrup of phosphate iron, B.P., for any length of time has been recognized by all. Several chemists have at various times made experiments with a view of preventing this change, but to the present time no satisfactory result has been ascertained. Recognizing this, Mr. Carteighe, some time ago,* in

* *Pharmaceutical Journal*, 3rd series, i., 761.

order that it might be made with greater facility, at shorter intervals, published formulæ for shorter processes for this and other allied syrups, in which phosphoric acid, sp. gr. 1·5, is used, instead of the ordinary dilute acid of the Pharmacopœia. As the phosphates to be used in these processes were only to be a few days old, and would practically have to be made purposely, it is very questionable whether the processes would be shorter than the B.P. method. More recently, two writers have proposed a liquor ferri phosphatis to be mixed with the syrup when required. It has been stated that the solution keeps for an indefinite length of time. It becomes interesting to know whether it is as stable as has been claimed for it. In the early part of last December I prepared solutions of phosphates of iron, iron and manganese, iron and lime, and manganese. Bottles were filled with the solutions and placed in a dark cupboard. In June last, six months after having been made, no change was perceptible. Being out of the syrup I had to open the bottle and use some of the liq. ferri phosph. Since that time a slight but distinct deposit has taken place, whilst the colour has remained unchanged. The latter fact seems to confirm the conclusions of the President of the Conference, that the dark colour is due to the production of caramel by the action of the phosphoric acid and the iron salt upon the sugar.† The brown tinge noticeable in all the solutions containing ferrous phosphate is the same as when first prepared, and is probably due to the partial oxidation of the salt during washing. It is not discernible when mixed with syrup. Considering the length of time the solution has been made, the amount of deposit is very small, and consequently the solution is an excellent method of preserving the salt.

In the following formulæ the proportions of phosphoric acid and phosphates correspond to those given by Mr. Carteighe :—

Liq. Ferri Phosphatis.

Sulphate of Iron	224 grains.
Phosphate of Soda	200 "
Acetate of Soda	74 "
Phosphoric Acid, sp. gr. 1·5 .	7 fluid drachms.
Distilled Water	q. s.

Dissolve the sulphate of iron in 1 oz., and the phosphate and acetate of soda in 2½ ozs. of warm distilled water. When quite cold, mix and well stir the two solutions, allow to remain for a few minutes and then wash the precipitate, by means of decantation, with distilled water. Collect the precipitate on a filter and allow to drain. Lastly, add it to the phosphoric acid and make up, with distilled water, to 2 fluid ounces. One fl. drachm is equivalent to 6 fl. drachms of syrup.

The tediousness of washing the precipitate as ordered in the B. P. is well known. I have not been able to find, but I have some

†*Ibid.*, 2nd series, vol. xi., p. 138.

recollection of a paper by Mr Groves, suggesting, in order to obviate the difficulty, that after mixing the two solutions, the whole should be boiled for a few minutes, using one-fifth more of each ingredient to make up for the phosphate of iron dissolved in the process. That method appears to me unreliable and unnecessary. Would the quantity of phosphate dissolved be always the same? In the process I have given, the salts are dissolved in just sufficient water to yield nearly saturated solutions at a temperature of 60° F. Warm water is given merely to facilitate the dissolving. In this way the phosphate sinks rapidly, and is easily washed by decantation.

Liq. Ferri et Mang. Phosph.

Ferri Sulph	168 grains.
Manganesii Sulph. . .	113 "
Sodæ Phos	247 "
" Acet.	93 "
Aquæ Destillatæ . . .	q. s.
Acid. Phos. Glacial . .	ʒvi.

Dissolve 150 grains phosphate and 56 grains acetate of soda in 2 ozs., and the sulphate iron in 6 drachms of warm distilled water, and allow to cool. Wash and collect the precipitate as directed in the last. Dissolve the sulphate of manganese in 6 drachms, and the remainder of the phosphate and acetate of soda in 10 drachms of warm distilled water. Mix the two solutions. Wash and collect the precipitate as the preceding ones. Add the glacial acid to the two moist precipitates, and when dissolved filter and add distilled water to 2 fluid ounces; 1 fluid drachm is equivalent to 6 fluid drachms of syrup. The syrup when made will contain ¾ grain phosphate of iron and ½ grain phosphate of manganese in each fl. drachm.

Glacial acid has been used in this preparation, as directed in the *Pharmaceutical Journal*, vol. i., 3rd series, p. 288. It has kept admirably.

Liq. Ferri et Calcis Phosph.

Sulphate of Iron	224 grains
Phosphate of Soda	200 "
Acetate of Soda	74 "
Phosphate of Soda	508 "
Chloride of Calcium	156 "
Phosphoric Acid, sp. gr. 1·5 .	8 fl. drachms.

The ferrous phosphate having been prepared as before directed dissolve the remaining phosphate of soda in 5 ozs., and the chloride of calcium in 3 drachms, of warm distilled water. When cold, mix the two solutions, stir and wash. Collect the precipitate on a calico filter, after draining, press it firmly until the weight of the moist phosphate is reduced to 6 drachms. Dissolve the two precipitates

in the acid and add distilled water, if necessary, to make 2 fluid ounces. One fluid drachm is equivalent to 6 fl. drachms of syrup, which when made, will contain 1 grain of phosphate of iron and 2 grains phosphate lime in each fluid drachm.

Liq. Ferri et Strychniæ Phosph.

Sulphate of iron	448 grains.
Phosphate of Soda	400 "
Acetate of Soda	148 "
Phosphoric Acid, sp. gr. 1·5 .	10 fl. drachms.
Strychnia in crystals . . .	3 grains.
Distilled Water	q. s.

Dissolve the sulphate of iron in 2 oz., and the acetate and phosphate in 5 oz., warm distilled water. Wash and collect on a calico filter. After draining, press out some of the remaining water. Dissolve the precipitate and the strychnia in the acid, and add distilled water, if necessary, 2 fl. ounces. One fluid drachm diluted to six drachms with simple syrup will contain in each fluid drachm 2 grains phosphate of iron and $\frac{1}{32}$ of a grain of strychnia.

Liq. Ferri et Quinæ Phosph.

Sulphate of Iron	448 grains.
Phosphate of Soda	400 "
Acetate of Soda	148 "
Phosphate of Quinine . . .	96 "
Distilled Water	q. s.
Phosphoric Acid, sp. gr. 1·5 .	9 fl. drachms.

Prepare the ferrous phosphate in the same manner as directed for liq. ferri et strychnia phosph., and dissolve it in the acid, and make up with water to 2 fl. ounces. The phosphate of quinine is best added when required.

Syr. Ferri et Quinæ et Strychniæ Phosph.

As has been pointed out, this preparation neither in solution nor in syrup will keep without becoming discoloured. It may be made by adding 6 gr. phosphate of quinine to each fl. drachm of the liquor, or 1 gr. to each fl. drachm of the Syr. Ferri et Strychniæ Phosph.

Liq. Zinci Phosph.

Most chemists keep phosphate of zinc, and, as its solubility is not impaired by keeping, it is best made direct in the manner directed by Mr. Carteighe.

Liq. Manganesii Phosph.

Sulphate of Manganese. . .	226 grains.
Phosphate of Soda	194 "
Acetate of Soda	74 "
Phosphoric Acid (1·5) . . .	7 fl. drachms.
Distilled Water	q. s.

Dissolve the sulphate of manganese in 1 oz., and the phosphate and acetate of soda in 2½ oz., of warm distilled water. Mix the two solutions. Wash by decantation. Collect on a fine calico filter, and, after draining, press out a portion of the remaining water. Dissolve the precipitate in the acid, and add distilled water, if necessary, to 2 fl. ounces.

One part made up to six with simple syrup will contain in each fl. drachm 1 grain of phosphate of manganese.

The PRESIDENT: Mr Daniel's formulæ seem to be well thought out and well worked out, and perhaps will be useful to many of us. These syrups are often ordered, and what we want is a rapid mode of making them. The great obstacle to rapidity is the difficulty of washing the precipitate, and I prefer mixing the solutions hot and boiling them. I find that, if instead of using acetate of soda I use carbonate, I get a better result. I mix the phosphate of soda and sulphate of iron, and boil them rapidly; I get of course a precipitate, and a certain amount of phosphate dissolved. Then I put in carbonate of soda as long as effervescence ensues, and I get thrown down a granular precipitate, which is very easily washed. In this way I have been enabled to make syrup of phosphate of iron in about an hour. Omitting acetate of soda does not entirely prevent colouration, though it does so to some extent. I know some have said that the colouration of the syrup of phosphate of iron is due to the formation of peracetate of iron, but that is not so, because syrup made without acetate also colours, though it takes a longer time. I have now to ask you to pass a vote of thanks to Mr. Daniel.

The vote of thanks was passed unanimously.

Mr. EKIN: I have found that the acid solution of the precipitated phosphates will keep for years without the sugar, and the way I manage is to keep a quantity of that, and make the syrup in small quantities as it is wanted.

Mr. UMNEY: I can quite corroborate what Mr. Ekin has said, for I have for years made a solution of phosphate of iron which I have found to keep very well. There can be no question that the use of dilute phosphoric acid in pharmacy for the manufacture of these sprups will eventually be abandoned, and that the precipitated ferrous phosphate will be dissolved in a concentrated phosphoric acid (1·500 specific gravity containing about 49 per cent. of anhydrous acid, answers excellently). Such a solution will keep perfectly well, and may be added to the simple syrup when required. I have made a solution eight times the strength of the Pharmacopœia, which can be diluted when required by the addition of simple syrup, and in this way one can get a preparation equal, if not superior, to that of the Pharmacopœia.

Mr. SMITH: I should like to ask these gentlemen if they do not find a small deposit at the bottom of the bottles of the acid solution.

I have made the solution with strong phosphoric acid, and have sometimes found there has been a deposit.

Mr. EKIN: I did not use the strong phosphoric acid, but the dilute acid of the Pharmacopœia, and proceeded precisely the same as the Pharmacopœia orders. The solution thus made keeps, to my knowledge, for three or four years without the slightest change.

Mr. GILES: I should like to ask a question about the precipitation, which the writer seems to think the most tedious part of the process. The phosphate of iron, when first thrown out of solution, appears to subside very tardily, but after it has subsided, and you have decanted one lot, and added water, it precipitates very rapidly, so that you can speedily throw it on a calico filter and squeeze it dry. Finding the first subsidence is so tedious, it occurred to me, that perhaps if more water were used in the first place it would subside more quickly.

The PRESIDENT: Perhaps the hydrated phosphate breaks up and loses it water of hydration.

CALCINED MAGNESIA IN MIXTURES.*

BY HANS M. WILDER.

Some time ago, I received the two following prescriptions:

I.	Magnes. ustæ	℥ii.	
	Aquæ destill.	℥ii.	M.
II.	Magnes. ustæ		
	Bals. copaivæ	*aa* ℥i.	
	Aq. camphoræ	℥v.	
	Syrup. tolu	℥i.	
	Spir. æth. nitr.	℥ii.	M.

As both the prescriptions were written very plainly, and no objections otherwise could be made to them, I dispensed them to the letter, although I knew that both mixtures would become solid in a short time. I was hereby induced to examine whether it would not be possible to keep them in a liquid state, at least for a few days. An observation of Mr. Gobley's (*Amer. Jour. Pharm.*, xiv, 1845, p. 273), that the presence of sugar would retard, if not altogether prevent, solidification, led me to try the addition of sugar also.

I consequently made eight mixtures:

1. One part light calcined magnesia and eight of water.
2. The same, but submitted to boiling.
3. One of light calcined magnesia and eight of simple syrup.

* American Journal of Pharmacy.

4. One of light calcined magnesia, six of water and four of syrup

5. The same, submitted to boiling.

6. One of light calcined magnesia, four of water and four of syrup.

Further:

7. One heavy calcined magnesia (Powers & Weightman), and eight of water.

8 The same, submitted to boiling.

After a quarter of an hour, 1 was jelly-like; 2, somewhat stiffer (by the addition of one drachm of water it could be shaken); 3 could be freely shaken and poured out; 4, somewhat between 2 and 3; 5, just the same; 6, stiff jelly.

After twenty-four hours, 1, 2, 4 and 5 were quite stiff; addition of a little water to 1 made it quite fluid; the consistence of 2, 4 and 5 was not altered; 3 and 6 decidedly hard.

The two heavy magnesia mixtures behaved like any mixture of water and an insoluble powder, remaining at the bottom of the vial, but very easily shaken up.

The results I arrived at are: 1st, To mix light calcined magnesia with *not less* than twelve parts of water; or, where the amount of liquid cannot be increased, to use the heavy calcined magnesia. 2d, Boiling does not make the mixture more fluid. 3, Sugar does not prevent hardening, except on increasing the quantity of liquid, and is then not necessary.

CURIOUS CONVERSION OF ALCOHOL INTO ACETATE OF ETHYL BY THE AGENCY OF CRYPTOGAMIC LIFE.*

BY F. M. RIMMINGTON.

To those acquainted in any degree with the remarkable power of metamorphosis possessed by some of the microscopic cryptogami, this paper will be of interest. It may probably have been noticed by others that concentrated infusion of quassia is very prone to become acid, but the conversion of alcohol into acetic ether has probably not been before noticed. I assume, both from my own observation and the published experiments of Pouchet and Pasteur, that this transformation has been brought about by the agency of cryptogamic life in the fluid, whether that life was fungoid or otherwise.

My attention was recently drawn to a bottle of concentrated infusion of quassia that I had made myself some months ago, which smelt so strongly of acetate of ethyl that it was rather difficult to resist the belief that some had not been introduced. The fluid was

* Pharm. Jour. & Trans.

quite clear and bright without any sign of fermentation or other change going on. On pouring off the clear liquor, a very thin stratum of sediment appeared at the bottom of the bottle, looking very like mud.

The circumstance aroused in my mind an interest to know the explanation of this phenomenon, and the inquiry took the following shape:—Lignum quassia has often a fusty smell and a corresponding taste; this I attributed to the presence of some form of fungus growth—and most probably the fungus is a penicillium—and, assuming this to be so, the probability is that some of the spores have got into the fluid, and have been slowly and silently effecting the conversion of the alcohol into acetate of ethyl. It is this fact which constitutes the point of interest, for if the alcohol had only become changed into acetic acid, the presence of fungi or anything else would not have been necessary, but the change is of a more complex and delicate character. The amount of acetic acid present is only small, and much diluted, but the odour of the ether is powerful. The next point was to prove the theory I had set up, and I proceeded to examine the sediment microscopically. With a one-fifth objective it looked like granular amorphous matter, mere points, without structure. But sufficient was shown to determine that it was not inert matter, and, on submitting it to the amplifying power of 800 or 900, its nature was clearly and beautifully displayed; it was made up entirely of unicellular organisms, of a somewhat irregular roundish form about one-third the size of a yeast cell, and having like that one or more nuclei. Besides these cells, were a considerable number of bacteria, or vibrios.

To mycologists there is another point of interest I will mention; these exceedingly minute bodies, when viewed by reflected light, look opaque, and of a *drab or gray colour*, and are not globular, but flattened on two sides. These flattened sides have raised edges and slightly raised centres, something like the top of a pork pie.

August, 1874.

ANTAGONISM BETWEEN CHLORAL HYDRATE AND STRYCHNIA.*

Dr. J. H. Bennett, of London, has been experimenting on this subject. It appears to be established from these experiments:—

1. That, after a fatal dose of strychnia, life may be saved by bringing the animal under the influence of chloral hydrate.

2. That chloral hydrate is more likely to save life after a fatal dose of strychnia than strychnia is to save life after a fatal dose of chloral hydrate.

*Phila. Med. and Surg. Reporter.

3. That, after a dose of strychnia producing severe tetanic convulsions, these convulsions may be much reduced, both in force and frequency, by the use of chloral hydrate, and consequently much suffering saved.

4. That the extent of physiological antagonism between the two substances is so far limited, that (1) a very large fatal dose of strychnia may kill before the chloral hydrate has had time to act; or (2) so large must the dose of chloral hydrate be to antagonize an excessive dose of strychnia, that there is danger of death from the effects of the chloral hydrate.

5. Chloral hydrate mitigates the effects of a fatal dose of strychnia by depressing the excess of reflex activity excited by that substance, while strychnia may mitigate the effects of a fatal dose of chloral hydrate by rousing the activity of the spinal cord, but it does not appear capable of removing the coma produced by the action of chloral hydrate on the brain.

It is scarcely necessary to point out the vast importance of these results to practical medicine, and the indications they afford, not only in cases of poisoning by strychnia, but in cases of tetanus and other spasmodic diseases, reflex and central.

PRESCRIPTIONS.*

BY M. S. BIDWELL.

Notwithstanding all that has been written by physicians and pharmacists on this subject, there are some points that do not seem to have been placed before the two professions with sufficient clearness. As this is a subject of interest to all your readers, will you allow me to attempt this?

The first question is on the ownership of the prescription or recipe. To which one of the three parties concerned—physician, patient and pharmacist—does it belong? It may aid us in answering this question fairly, if we first consider what a prescription is, illustrating it by an example. Suppose a physician to visit consecutively three patients. To the first he may say, "You need some beef tea: get a piece of the round to make it of. I will give you a note to the butcher, explaining what kind you want." To the second he might say: "Send your boy to my office with this memorandum, and the student there will give you the necessary medicine"—the memorandum directing, perhaps, to give him four pills out of the box on the lower shelf, or any other instructions that the student will understand. To the third he gives a recipe, in the

* From the American Journal of Pharmacy.

usual form, directing the pharmacist into whose hands it may come to put up a certain mixture for the patient's cough. Now, is it not evident that the note to the butcher, the memorandum to the student, and the recipe to the pharmacist are precisely analogous? We may therefore define a prescription to be a confidential letter from a physician to a pharmacist, instructing him to dispense certain medicines according to directions given. So far, then, as these two parties are concerned, it would follow the same rule as any other letter —the recipient being entitled to its custody, but having no right to publish it, or use it in any similar way, without the consent of the writer.

But there is a third party in this case—the patient; and by universal custom, sanctioned by law wherever the statutes touch the subject, he is entitled to a copy of the document. The original should remain in the hands of the pharmacist, for reasons which need not here be given.

The second point concerns what is called the renewal of prescriptions, or, more properly, dispensing the same medicines repeatedly on the same recipe. The very common practice has been extensively denounced by physicians, on various grounds, but with a curious and complete disregard of the party most directly interested —the customer. Their usual line of argument on this subject, if carried out to its legitimate conclusion, would forbid the sale or use of any medicines unless by the express direction of a doctor. They say, with perfect truth, that much harm is done by ignorant prescribing, and by unqualified persons dosing themselves and others with medicines whose powers they do not understand. Therefore the government, or the druggist, or somebody, should henceforth decree that this be done no more. They do not apply or state it so broadly as this; but the principle is evidently the same, whether the medicine were originally prescribed by a physician or not; so that it is here stated in its broadest form, in which shape it is a clear *reductio ad absurdum*. The evident answer, if any answer is needed would be, that in this country every one is presumed to be able to judge for himself, and must be allowed to take his own risk, if he will. Any interference on the part of the druggist would naturally be resented as an impertinence, and be met by the just remark that it was none of his business.

In the more special case immediately under our notice, the reduplication of the prescription cannot be prevented, even if both physician and druggist should try to do so. The patient is entitled to a copy, and can, of course, have the same medicine put up from that, or from a copy of that. Even physicians will hardly claim that no druggist should ever put up any medicine that any physician had ever prescribed!

There is another complaint often made by physicians, which is, in some respects, the reverse of this, viz., that prescriptions are often

"stolen" from them by druggists and others, and used to their disadvantage, by curing their patients without their help. In the former case, the ostensible ground of complaint was that the recipe might injure the patient; in this, the danger is that it may benefit him, without bringing any pay to the physician. Poor doctor! so long as he does not get his fee, he is equally dissatisfied, whether the patient grows better or worse! Well, it is hard, if a man has got hold of an efficient formula for a certain class of cases, to have Tom, Dick and Harry steal his thunder, and cure just as many and just as well as he can himself, and perhaps make a great flourish about it, too. But our pity for him will be lessened if we remember that he himself owes almost all of his prescriptions to others; and it will be reduced to a minimum by the reflection that it is only by the free contribution of many workers that medical science (or any other) can ever be built up. The only way a man can keep others from knowing what he does, is to keep it a secret, which, if generally carried out, would throw us back into the dark ages. At the same time it must not be forgotten that, if any one wishes to monopolize any item of knowledge, he has a perfect right to do so, and no one can justly complain of such a course, though no one can admire it.

Briefly to recapitulate:

(1). A prescription is a confidential letter from a physician to a pharmacist, the latter having the right of custody, but not the right to make it public. The patient, being an interested party, has a right to a copy.

(2). The druggist's business to furnish whatever medicines the customer wants, whether prescribed by a doctor or not, the patient taking his own risk.

(3). The physician, like any other scientific man, should be liberal in communicating what he originates, because most of his own knowledge is derived from others, and in this way only can science be advanced. But this obligation is ethical, not legal, something to be desired and recommended, not enforced.

I hope no part of the above will be understood to countenance the practice of "prescribing across the counter," or of prescribing by any other unqualified party. This is a nuisance in the drug business, and one that every intelligent and fair minded pharmacist will endeavor to abate. But the doctors do not seem to me to be really the sufferers, nor (according to my observation) are the druggists usually the sinners. Both the fault and the suffering belong to the ignorant public, who insist upon the druggist "fixing them up something for a cough," so that they may evade the payment of the doctor's fee. This subject is a painful and suggestive one, too extensive to be followed out here.

ON THE APPLICATION OF OLEIC ACID TO PHARMACY.*

BY PROFESSOR TICHBORNE (DUBLIN.)

The object of this paper was to introduce to pharmacists the use of oleic acid in liniments and other preparations where soaps, which are alkaline salts of oleic acid, are now employed. The author confined his remarks entirely to liniments on this occasion, intimating, however, that there were many other pharmaceutical uses to which oleic acid could be advantageously applied, to a consideration of which he would recur on a future occasion.

The only important suggestion as to the use of oleic acid had been made by Dr. Attfield, who had proposed to dissolve alkaloids in this acid previously to combining them with cod liver oil. These preparations, however, are now no longer used, and therefore the suggestion has fallen through. But the method of dissolving any powerful alkaloid, such as aconitine, in oleic acid, when it has to be combined with a fatty body, as in the case of ung. aconitiæ, is a great improvement, inasmuch as we thus obtain a solution in the fat, and not a mere mechanical mixture.

The oleate of mercury which has been introduced, Professor Tichborne thought, would not be much used on account of its unsightly appearance.

Oleic acid, which not long ago was a chemical curiosity, is now to be obtained by tons, and very cheap. It is produced by the splitting up of palm or other oils into glycerine and the fatty acids. Stearic and the other hard acids are used in the manufacture of candles, and the fluid oleic acid remains as a by-product. The best is known as "pale cloth oil." There is also a brown German oleic acid which is extremely cheap, but much inferior in quality. A curious fact in respect to oleic acid is that, while it is itself poisonous, the oleates are quite harmless, providing the base is so. Rats and mice, though eager after all other neutral fats or oils, carefully avoid oleic acid.

After describing briefly the characteristics of the various oleates, Professor Tichborne gave the following formulæ for the various liniments of the Pharmacopœia.

Linimentum Ammoniæ.

In preference to the old formula, which produces an emulsion, changing gradually into a semi-solid soap, Professor Tichborne recommended the following:

Oleic Acid, ʒ j.
Water, ʒ ij.
Strong solution of Ammonia, ʒ ij.

*Read at the Meeting of the British Pharmaceutical Conference; reported in the Pharmaceutical Journal and Transactions.

Mix the water and oleic acid, and add the solution of ammonia gradually but with agitation. This will yield a liniment of definite and unchangeable composition.

Lin. Potass. Iod. c Saponæ.

A very useful stimulating liniment, but most unmanageable in its present form. The following was proposed in its place :

Oleic Acid, 6 ozs.
Carbonate of Potassium, 2 ozs.
Iodide of Potassium, 7½ ozs.
Glycerine, 5 ozs.
Oil of Lemon, 5 drs.
Water, 2½ pts.
Solution of Potash, q s.

Dissolve the carbonate with heat in 10 ozs. of water, add the oleic acid, and when the effervescence has ceased add the remaining ingredients together, and then a sufficiency of solution of potash to make it of the requisite consistence.

Linimentum Saponis.

As a more perfect form for this much-abused liniment, Professor Tichborne suggested the following :

Oleic Acid, 8 ozs.
Carbonate of Sodium, 4 ozs.
Camphor, 5 ozs.
Oil Rosemary, 12 drams.
Rectified spirit, 3 pts. 12 ozs.
Water, 8 ozs.

Dissolve the carbonate in the water by the aid of heat, add gradually the oleic acid, and when the effervescence has subsided add the rosemary and the camphor dissolved in the spirit, and filter if necessary.

Certain liniments may be regarded as emulsions, of which Lin. Terebinth. is typical. In these cases oleic acid behaves beautifully. The following is the formula :

Lin. Terebinth.

Oleic Acid, 1 oz.
Oil of Turpentine, 16 ozs.
Camphor, 1 oz.
Solution of Potash q s.

Dissolve the camphor and oleic acid in the turpentine, and add gradually the solution of potash, until the whole is emulsified.

Professor Tichborne added that doubtless these formulæ might be improved upon, but he was confident that the days of the old forms were numbered. No one who now uses oleic acid in making the saponaceous liniments will wish to return to the soaps.

The Chairman, in proposing the customary vote of thanks, regretted there had not been more time placed at Professor Tichborne's disposal, as the subject was well worthy of further elucidation at the Conference, and particularly of further experiment.

Mr. Fraser submitted the experience of the principal oculist in Glasgow to the Conference, and said that the use of oleic acid had been of very great service to the gentleman in the treatment of the particular class of disease which was under his charge.

Dr. Attfield said he could not accept all the credit that seemed to be given to him by Professor Tichborne. For several years after the paper on the method of dissolving alkaloids in oil was published, he had had the subject brought under his notice, but how this came about he really did not remember, but some one had stated some fifteen or twenty years ago that alkaloids could be dissolved in fatty acids.

Mr. G. F. Schacht said that although one might see the desirability of employing oleic acid in the place of olive oil in the manufacture of liniments, he could not help thinking that it would be very desirable in most cases that the definite compounds should be first of all prepared rather than that they should attempt to extemporise their preparation at the moment of use, for of course the chances would be that they would not get a perfectly neutral preparation, which in some cases might be most necessary. He wished to speak now upon the peculiar and, according to his experience, very useful preparation, the liniment of iodide of potassium, which he believed was understood to owe its paternity to the firm of Messrs. Smith & Co, of Cheltenham. There the good result was obtained by the use of one kind of soap containing very little of the oleate of soda, but a very large proportion of the stearoptate of soda. The curd soap of the Messrs. Benbow was best. When that was used they certainly did have a capital preparation, and one which looked like a clotted cream more than like anything else It maintained its consistency for a great number of months, as he could testify from experience. They could produce the same things invariably by simply using the same material. There was no disappointment whatever in it, and it made a delightful method of applying this remedy externally. Of course it was an open question whether very much good attended the external result, but if intended to be applied at all, this was a very elegant form in which to do it.

Mr. Umney remarked that the specimens of oleic acid with which the learned professor had been experimenting were far superior to the article of commerce sold under that name in England.

Dr. Attfield said that oleic acid was now used on an enormous scale (only it was much darker) by clothworkers. Oils and fats of many kinds which formerly were thrown away through being so impure as to be almost useless, were now "recovered" as the phrase ran, and thus an immense amount of oleic acid came into trade, the

better varieties commanding larger prices than the darker. Still there were large quantities of oleic acid of a light color—far larger than were likely to be used in pharmacy.

Mr. Remington: Don't you think it would be objectionable on account of the persistency of its smell?

Mr. Hanbury observed that this was a case in which two sides had to be looked at, viz., cheapness and goodness.

Professor Redwood expressed his personal thanks to Professor Tichborne for having undertaken so many experiments in reference to this matter. Some time ago, indeed on more than one occasion, he had suggested to this Society the desirability of investigating the whole subject of the liniments used in pharmacy. He considered them to be in decidedly an unsatisfactory position, and that they were very much in want of some general principle upon which to proceed in their preparation. He entertained the hope that here they had a suggestion that might prove useful, and although it had been stated that the formulæ which had been put forward were not in a state of progress, and that there was room for further investigation on the subject, yet he was sure that the investigation would result in the enunciation of improved processes for liniments. He might mention one in particular, which was the liniment of turpentine and acetic acid—a liniment consisting of materials which separated and could not be kept united. He had made several experiments himself with the view of getting a more homogeneous liniment as a substitute for it, and there were several others. In fact, the whole of them required to be thoroughly revised, and he should be glad some day to see some general principle acted upon, and some menstruum adopted which should serve as a medium for the application of more active constituents. He looked rather hopefully to the use of oleic acid in this particular case.

Professor Tichborne then rose to reply to some of the observations which had been made. As to the purity of oleic acid one gentleman had said that it was a very common thing to introduce it as a substitute for soap. He must ask him if he had ever gone to a soap works and seen the funny things put in there? (Laughter.) If he did so he would find that soaps were much more indefinite than oleic acid. The acid on the table was a specimen of commercial oleic acid taken from an old cask of it, half an hour before he left home. In connection with liniments, all they had to do was with a peculiar condition of their solubility. He thought on repeating his experiments that they would be found as correct as applied to all oleic acid, and it was quite immaterial whether it was one or twelve months old. There were, he knew, some very inferior German qualities—(hear, hear)—in the market, but they were introduced for rough work. He did not believe the smell would be any objection to its use.

Mr. Williams remarked that this must be a *very* old specimen,

as the professor remarked, for he could not get any of it. (Laughter.) Oleic acid had become very bad lately, and it was most difficult to prepare those oleoids, so as to have them what they really ought to be. He had tried many experiments, and devised many plans of purifying it, but he must say that at present he had not at all succeeded to his own satisfaction. He believed there was a great future for oleic acid, and therefore he hoped that many present would turn their attention to it. At present the article in commerce going by that name was not good enough for pharmaceutical purposes.

ON THE ESTIMATION OF HYDROCYANIC ACID.

These remarks are extracted from a paper read by Mr. Louis Siebold before the British Pharmaceutical Conference, and are referred to in an article in our editorial department :

" Permit me now to offer a few remarks on Liebig's method of determining the strength of hydrocyanic acid. All who are practically familiar with this titrimetric method will, no doubt, be aware that the use of a large excess of KHO or NaHO, will make the result somewhat inaccurate, as in that case too much of the standard solution of $AgNO_3$ will be required to produce a permanent precipitate. The amount of alkali used should be slightly in excess of the quantity required for converting the HCN completely into KCN or NaCN; and if very accurate results are desired for the pupose of comparison as in the experiments I have quoted, the amount of alkali should be the same in each determination. But the error caused by the addition of too much alkali is small indeed compared to that resulting from the use of an insufficient quantity, and this is a point which, as far as I know, has never been alluded to in chemical literature. Let us bear in mind that Liebig's method is in reality a method for the estimation of KCN, but not of HCN, and that the use of less KHO than is required for the complete conversion of HCN into KCN must of necessity impair the result. The Pharmacopœia tells us to add sufficient NaHO to the acid to render the mixture alkaline, and this is precisely the statement which we find in the various books on chemistry and quantitative analysis. The mere use of sufficient alkali to produce a distinct or even a strong alkaline reaction, may lead an inexperienced analyst into serious errors, for the complete conversion of HCN into KCN or NaCN, cannot be recognised by red litmus paper. I will give some practical instances. In each of the experiments above recorded 5 c.c. of a standard solution of KHO, containing a molecular weight in one litre, were used. Of this solution 3·5 c.c. would be required to convert the 0.0961 grams of HCN present in the 100 c.c. of diluted acid into KCN. But a much smaller quantity would suffice to produce a distinct alkaline reaction;

½ c.c instead of 3·5 would produce a distinct, 1 c.c. a strong, and 2½ c.c. a very strong alkaline reaction, although in each case the acid would only be partially converted into KCN. A solution of KCN turns red litmus paper blue, even in the presence of a large quantity of free hydrocyanic acid. If the standard solution of $AgNO_3$ is added to such a mixture of KCN and free HCN, a permanent precipitate is obtained as soon as the KCN has been converted into KAg, 2CN, when the alkaline reaction will be found to have ceased, as the double cyanide has a neutral reaction. The following experiments will show the very erroneous results which may be caused by an insufficient use of alkali.

100 c.c. of the diluted acid, as before, were used for each experiment.

Standard solution of KHO added.	Reaction of the mixture.	Standard solution of $AgNO_3$ required to produce a permanent precipitate.
½ c.c. .	Alkaline	2·4 c.c.
1 c.c. .	Strongly alkaline . .	5·1 "
2½ c.c. .	Very strongly alkaline	12·3 "
3½ c.c. .	do.	17·5 "
(The exact quantity required for converting the HCN into KCN.)		
5 c.c. .	do.	17·8 "
(Containing a moderate excess of KHO.)		

In the first four experiments the mixture ceased to be alkaline after the addition of the $AgNO_3$; in the fifth it remained alkaline.

The number of c c. of $AgNO_3$ used in each case corresponds almost exactly to the calculated quantity of KCN present, which clearly shows that the excess of HCN does not affect the result. It is interesting to observe that KCN and HCN can thus be accurately estimated in a mixture of the two.

I do not suppose that experienced analysts would be likely to make such serious mistakes in the determination of hydrocyanic acid as the above experiments show to result from the presence of too little alkali; but I feel sure that the less experienced chemist who is accustomed to work strictly according to the recipe, having implicit confidence in the *modus operandi* prescribed by Liebig, Fresenius, and other eminent analysts, may very probably make such mistakes. Let it therefore be well understood that it is incorrect to use, as the books tell us, sufficient KHO or NaHO to render the mixture distinctly alkaline, or even strongly alkaline, but that the quantity of alkali should somewhat exceed, though only to a moderate extent, the amount required to convert the acid into a cyanide. If at the end of the experiment the mixture does not turn red litmus paper blue, the quantity of alkali used was insufficient, and the result of the analysis will be inaccurate. Should the hydrocyanic acid contain HCl, as is frequently the case, it is evident that the inaccuracy caused by the use of too little alkali would be still increased.

As a rule the chemist will have some idea of the strength of the hydrocyanic acid he is testing; if he has not, a rough experiment with a large excess of KHO will give him one, and he may then calculate the amount of alkali required for an exact determination. An acid containing 2 per cent. or more should be very largely diluted with water in order to obtain a distinct end reaction. Liebig recommends the addition of five to eight volumes of water, but I believe that a much larger quantity (fifteen to twenty volumes) will be found preferable. A slight excess of alkali is useful or even necessary; a very large excess, however, impairs the result. I found that for every 10 c.c. of the solution of KHO which were added in excess of the required quantity, an additional 0·1 c.c. of the solution of $AgNO_3$ was required to produce a permanent precipitate, so that but a slight error will be caused in the result of the analysis by an excess of alkali which is not unreasonably large. The injurious influence of a very large excess of potash is pointed out in several handbooks on quantitative analysis, but no reference is made to the far more serious mistake of using too little alkali in any of the books or journals that have come under my notice.

A SUBSTITUTE FOR STEAM.

Under the name of carboleum, Dr. Beins, of Groningen, describes in the *Isis*, a Dutch journal, a new invention, which he claims is superior to steam for many motor purposes. He has found that when a bicarbonate of sodium or potassium is heated, dry or in solution, in a closed flask, it yields up a portion of its carbonic acid, which condenses in a cool chamber, so that liquid carbonic acid (carboleum) can be distilled out of those substances at a temperature of from 300° to 400° C. He proposes the use of the liquid for many purposes, such as various stationary and locomotive engines, formation of electric light, etc., etc.; claiming that it is both safer and much cheaper than steam. As an engine with a store of carboleum is independent of the atmosphere, the invention is especially applicable to submarine work, and we believe that the Dutch government is investigating the practical use of the liquid in this direction. Freezing-machines worked by carboleum are said to produce ice much more cheaply than does any method hitherto invented. If this be so, artificial ice must in the course of a few years largely replace the natural product; and if the doctor's calculations be correct, gas will be largely superseded by mechanical electric lights.—*Phila. Med. Times.*

THE PREVENTION OF MISTAKES BY DRUGGISTS.

Mr. Hans M. Wilder, a well-known contributor to the *Druggists' Circular*, sends to that journal the following useful and practical suggestions on the prevention of those mistakes which occur from the substitution of poisonous substances for those of less active properties :

1. Put all poisonous alkaloids (excepting morphia) on one of the topmost shelves, behind the shop-jars or bottles. In this way they will not disfigure the store, being always in small bottles, and the topmost shelf being generally quite high. It is easy to understand that none of those alkaloids can be given by mistake, since you have the trouble of using yonr step-ladder or a chair to get hold of them, trouble enough to set you a thinking what you are going to do (most mistakes arising from being half asleep, so to speak).

2. Do not keep any shop bottles with glass labels for poisons, but keep them in their original package. This prevents them from being kept in line with the remainder of the bottles, and does away with one source of mistakes.

3. Keep morphia on the top shelf of the prescription counter, and quinine on the bottom shelf; their original packages suggest this arrangement. Arsenic to be kept under the counter, and corrosive sublimate best with the poisonous alkaloids; if the latter be considered too much trouble, then put it on one of the prescription counter shelves (say among the extracts), but not next to calomel.

4. In conclusion, I must beg my very young colleagues to keep in mind, that no physician intends to prescribe morphia or strychnia or atropia, etc., in, say, five to ten grain, or half-drachm doses, or any other unusual quantity, however sure you may seem to be that you read aright. Make out a list of all poisonous substances and write opposite the maximum dose (you can find it in Wood & Bache, or in Parrish); learn this list by heart, or, better still, paste it on one of the uprights of your prescription counter, so as always to have it before your eyes. When you are in doubt ask your superior, but do not try to guess; as you grow older you will be more able to rely on your own judgment. There is no shame in not knowing or recollecting everything.

5. It is in general well enough to do things quickly, but in a drug store give yourself sufficient time to ascertain that you have got hold of the right bottle before you weigh or measure out; and when you replace said bottle on the shelf, give another look at the label, however morally sure you may feel that you have made no mistake. Let this, *twice looking at the label*, become a habit with you.

6. Do not put together two or more drugs or preparations that look pretty much alike. For instance: do not put oxalic acid next to granulated potass. nitr. or ammonia murias; neither put aq. ammonia next to any of the medicated waters, spirit. æther. co. or spirit. æther. nitros. etc.

The rule will then be to put all dangerous drugs or preparations between two dissimilar ones. The liability of taking hold of the wrong bottle will thus be much diminished. By the way, it would not be a bad plan to arrange *all* the bottles according to the last rule. Many disagreeable mistaks may in this way be avoided; for example, to give spir. menth. pip. for spir. limonis, or pulv. cubebæ for pulv. extr. glycyrrhizæ, etc.

You will perhaps say, that no ordinarily careful pharmacist will happen to make such blunders; that is so, but if you only knew how much in a double-quick hurry my young colleagues generally are, you will not deem the above rule much amiss.

I think these six rules will be of greater service than using bottles with rough exterior, or otherwise marked.

PECULIAR TOXIC ACTION EXERCISED BY THE COLCHICUM AUTUMNALE AT THE TIME OF FLOWERING.*

BY I. PIERRE.

The author, in a letter recently communicated to the French Academy, states that having plucked some fully expanded flowers of *Colchicum autumnale* in order to examine them more closely, he was surprised to notice that after a few seconds his fingers had changed color, and taken the livid greenish yellow tint characteristic of a corpse in a state of incipient decomposition. After about ten seconds the skin regained its usual color. As the discoloration extended throughout the length of the fingers, and even beyond, the question arose whether or not it was caused by absorption by contact at the extremity of the fingers. M. Pierre therefore extended his hand over a large clump of flowers, having anthers two or three centimetres in length, and carefully avoided all contact. The same phenomenon was produced with the same rapidity, and disappeared as quickly when the hand was removed. The experiment was repeated several times, and by different persons, but always with the same result.

In order to investigate the matter more conveniently, M. Pierre had two large clumps of colchicum flowers placed in pots and removed to his laboratory; but on repeating the experiment twenty-four hours afterwards the effect was not so obvious. Upon comparing the flowers capable of producing the phenomenon with those which have appeared to have lost the power, it was noticed that the inactive flowers had commenced to fade, and that the pistils and filaments of the staments were much paler in color than on the pre-

Comptes Rendus, in Pharm. Jour. and Trans.

ceding day, or than those of less advanced flowers. He therefore thinks it presumable that it is principally during or approaching the act of fecundation that the colchicum flower possesses in the highest degree the property above described.

What, then, is the substance in the flower capable of producing this effect, which disappears so rapidly? The author thinks it can scarcely be a solid or a pulverulent pollenic matter, or the color produced would be more persistent, but that it is probably an extremely volatile substance which has not yet been studied. In this view he is supported by the fact that after a number of experiments, without contact, and without raising his hand to his mouth, M. Pierre experienced in the organs of taste a peculiar sensation [*sensation vireuse*]; whilst his assistant, using the same finger many times, experienced a numbness in it which was persistent during several hours.

The author proposes to investigate the nature of this singular substance, which probably plays an important part in the accidents attributed to fresh colchicum compared with the innocuousness of the stale or dried flowers.

In connection with this action of certain principles of the colchicum flower, the author remarks that in the Gâtinais, where saffron is cultivated on a large scale, some persons, especially among women and children, cannot work at plucking the flowers, without suffering from the symptoms of a peculiar poisoning, which manifests itself externally in a swollen and bloated appearance.

A SIMPLE ANALYSIS OF ARABLE EARTH.*

M. Schlosing gives the following simple process for separating the clay in soils from other constituents, and consequently for determining the quantity of the former present:

The earth is thrown in water and the calcareous matter is eliminated by means of hydrochloric or other suitable acid. The carbonate of lime and humic acid, found in nearly all vegetable earth, hinders the clay from remaining in suspension in the water, and it is hence precipitated. By treating the liquor with ammonia, the humic acid is removed. The residue is composed of sandy matter and clay, but the former falls to the bottom, leaving the clay in suspension in the liquid, from which it may be separated by decantation. This method, though almost mechanical, it is said will prove of much value to agriculturists. M. Schlosing has found that earths, considered argillaceous, in some cases contained little over 2 or 3 per cent. of clay, while others, supposed to be composed almost entirely of that substance, contained but 30 per cent.

*Jour. of App. Chem.

DETECTION OF FALSIFICATIONS OF WAX.

The presence of *resin* in wax may be detected by its odor, or by treating the wax in the cold with alcohol; the alcohol dissolves the resin, the wax being almost entirely or quite insoluble. The alcoholic solution evaporated to dryness gives the resin, which may be easily recognised.

On treating wax with oil of turpentine—starch, and earthly substances are left as a residue, the wax only being dissolved.

Tallow is recognised by its taste and disagreeable odor. Wax containing tallow is less brittle and greasy to the touch, thrown upon live coals it produces a thicker and darker smoke than pure wax.

To detect the presence of *stearine*, the wax is cut into small pieces, and boiled with lime water; if the wax is pure, the lime water remains clear; if however it becomes stearine is present the lime water becomes opaque, and deposits a white powder which is insoluble stearate of calcium.

Some manufacturers continue to add considerable water to wax by agitation and fusion. This may be detected by the loss of weight of the wax when it is kept hot for some time upon the water bath.—*Science pour Tous.*

ELIXIR OF LIQUORICE.—I send you a formula for the Elixir of Liquorice, which has been extensively used in this city and vicinity for concealing the taste of quinia, etc. One fluid ounce will conceal the taste of from eight to ten grains of sulphate of quinia. It will be found equally as good as a vehicle for disguising the nauseous taste of medicines given in the powdered condition.

Liquorice root, ground	32 ounces.
Caraway seed	6 drachms.
Star-anise	16 "
Coriander	10 "
Cinnamon bark	16 "
Water	9 quarts.
Alcohol, 95 per cent	1 quart.
Sugar, white	80 troy ounces.

Macerate the spices with the alcohol mixed with one pint of water for seven days, frequently agitating; transfer to a percolator, and when the liquid ceases to drop, pour on the same menstruum until three pints have been obtained. Digest the liquorice with the water for two hours, then bring to the boiling point, and boil for fifteen minutes; express strongly, and mix the decoction with the tincture of the aromatics; let stand twenty-four hours, and filter. Add to the filtrate the sugar, and agitate until dissolved; again filter, and the elixir is ready for use.—*Correspondent of Druggist' Circular.*

Editorial.

AMENDMENTS TO THE PHARMACY ACT.

The proposed amendments to the Pharmacy Act were brought before the Ontario Legislature, a few days prior to the close of the late session. The Bill obtained a first and second reading, and was referred to a committee composed of Mr. Striker—who introduced the measure—Drs. Clarke and Giles, and Messrs. Hodgins and Grange. A meeting of the committee was appointed for Thursday Dec. 17th, but owing to the hurry and press of business it was next to impossible to get or keep together a sufficient number of members to form a quorum. The College of Pharmacy was represented by the Committee on Legislation, while the Registrar of the College of Physicians and Surgeons appeared in the interests of that body.

After some discussion it was decided that without the representatives of the College of Pharmacy pressed the matter it would be better to allow the Bill to lay over until next session. The opposition offered by the medical fraternity was of so determined a character that the third reading of the Bill would be liable to be attended with considerable discussion, and, at the close of the session, this would in all probability jeopardize the measure. Under these circumstances, the Committee on Legislation consented to the course suggested; and we are convinced that this decision is for the best.

The Act was drafted rather hurriedly, and though calculated to greatly improve the standing of pharmacists generally, and to correct errors and supply deficiencies in the existing law, yet it will doubtless be none the worse of a little discussion. To this end we reproduce, in another part of this number, the Act entire; and trust that druggists will embrace the opportunity thus afforded of making any suggestions which may be necessary. The greater portion of the substance of the Act was discussed, about a year ago, by the Council, and that since added has been taken from the Pharmacy Act of Great Britain of 1868. This was published in one of the earlier numbers of this Journal, and may with advantage be consulted.

DOCTOR AND DRUGGIST.

Some of our Montreal friends take exception to our views as expressed in the concluding portion of an editorial which appeared, under the above title, in our November number. The paragraph in question related to an article in the *Canada Medical Record*, in which the editor of that journal gave his opinion of the mutual relations of physicians and pharmacists. The rights of the latter class were so forcibly put that a lengthy extract was given and this was preceded by a remark expressive of our concurrence of opinion. To this we still feel inclined to adhere. Our contemporary's vindication of the rights of physicians was equally vigorous, and, though couched in somewhat violent language, was, as far as we were able to judge, equally just. This opinion was expressed, in similar words, in the paragraph to which we have referred as calling forth a little adverse feeling on the part of our Eastern friends. For this result we are sincerely sorry, and need scarcely say that it has arisen from a misunderstanding of our true meaning. While endorsing, with a reservation, the views of the *Medical Record*, we only did so as far as principles were concerned. Of individual instances, cited by our contemporary in proving his position, we were, of course, not qualified to judge, except in relation to their applicability. We thought at the time that some of these illustrations were far fetched. For instance, our contemporary speaks of having sent a prescription, "among the ingredients of which was a certain extract then *newly ordered* in the Pharmacopœia," and which prescription was more than once dispensed; although, on enquiry, it was ascertained that none of the dispensers had any of the extract in question. As the extract was "newly ordered in the Pharmacopœia," this incident could not have occurred within the last seven years, and, even if correct, has nothing whatever to do with the existing state of things in Montreal. Indeed we are assured that in no city in Canada is there more honorable dealing on the part of chemists, and we are inclined to think that our Montreal friends would discountenance and denounce as strongly as ourselves the practice of counter prescribing; extortionate or excessive charges; or uncalled for interference with physicians' prescriptions.

Our contemporary was correct enough in his principles, but somewhat unfortunate, and, perhaps, somewhat vindictive or personal

in his application of them. This is the more to be regretted as it is opposed to the fostering of that amicable feeling which should exist between doctor and druggist. It is to the general interest that this be cultivated to the utmost, and we are pleased to see that the general feeling is in this direction. On this subject we cannot do better than give an extract from an address delivered by Dr. Charles Buckingham, before the Graduating Class of one of the Massachusetts colleges :—

"There are relations between our professions which it is worth while to call attention to. It has been the case, sometimes, that the pharmaceutist and the physician have run in opposition to each other. This should not be. Every man has his preference for individual members of any trade and of any profession with which he has dealings. But you have no right to turn my patients into the hands of any other medical man who chooses to send his prescriptions to you. I have no right to require my patients to buy drugs at any other store than that which they are accustomed to deal at, because he who keeps it is one who patronizes me. The physician who keeps a private remedy at a particular shop, which can be put up only on his order, and which no other druggist can understand, is a quack who has violated his word of honor. If you furnish drugs which I know to be inferior, because they cost you less than drugs of the first quality, that alters the case. Meanness is criminal wherever it exists, and should be punished.

"Let us have a case or two from either side of the sheet. A medical man wrote a prescription for some morphia in pills. The size of the pills was excessive, and nothing upon the prescription indicated that there was any unusual call for what to most people would have been a fatally poisonous dose. There were no written directions, as there should be upon every prescription. The druggist very kindly said to the bearer of the prescription that he would prepare the medicine and send it to the house. He tried for several hours to find the writer, and at last caught him at the dinner-table, was kept waiting for a time, and was finally informed by the doctor that he never made mistakes, and that the prescription meant what it said. Of course, the druggist returned to his shop, and while engaged in preparing the pills, a messenger from the same patient came with another prescription. It seems that without waiting to see his office patients, the doctor, on finding that he had made a blunder, too proud to acknowledge it and thank his informer for saving his patient, had hurried to his patient's bedside, changed his prescription as the result of new thought, received the thanks of the family for his attention, and repaid the apothecary with meanness, for an act of kindness which prevented a coroner's jury.

"I was knowing to the fact that a physician once advised some

medicine to be thrown away because it did not come from A's shop, at which he traded, and no one in Boston knew so well as A how to prepare it. It had been purchased at B's shop. I also knew that B made all of that particular preparation which A sold. The bottle was refilled from the same fountain, and pronounced to be all right. The first was a case of meanness. Meanness and ignorance combined formed the second, and both of them were deserving of punishment. I have known the same physician to change the form of a prescription, given on emergency by another who had been called in his place, simply that none but himself should have the credit of giving relief."

INSTABILITY OF HYDROCYANIC ACID.

The preservation of hydrocyanic acid has, of late, proved a fruitful topic of discussion, and in no case more particularly so than at the late meeting of the British Pharmaceutical Conference, when no less than four papers, relating to this subject, were presented and read. Although the theme is important and interesting, our space will not allow of our reproducing these papers, in full; we shall, therefore, endeavor to give, in as concise a form as possible, a summary of the most important points embodied in these valuable contributions to pharmaceutical literature.

Mr. Barnard S. Procter, the author of the first paper laid before the meeting, alluded to the researches of Messrs. Abraham, Siebold, and Towerzey,—abstracts of which have already appeared in this JOURNAL—and, though admitting the uncertain and unstable character of commercial specimens of the officinal acid, was of the opinion that the loss of strength by evaporation was not so rapid as some essayists would lead us to believe. Experiments were made with a view of finding some solvent, which, by a greater affinity for the acid, or from a more equal volatility, would diminish this loss. Rectified spirit and ether were selected, and dilute acids, prepared with these, were placed side by side with that made with water. These samples were subjected to influences and conditions similar to those affecting the acid as usually kept for dispensing; the bottles were frequently opened, and analyses were from time to time made. These tests demonstrated the fact that the alcoholic solution lost less by evaporation than the aqueous and that the ethereal solution suffered comparatively little change—the evaporation of the acid and ether proceeding at about the same rate.

Numerous experiments were made in order to determine the best formula for the extemporaneous preparation of acid of the officinal strength, and the conclusions were arrived at that, as a process, the decomposition of cyanide of silver by aqueous hydrochloric acid left nothing to be desired, except in regard to economy:

that crystallized cyanide of potassium may be obtained, commercially, pure enough for extemporizing hydrocyanic acid; and that it is permanent enough for general use; that in the decomposition of cyanide of potassium, by sulphuric or tartaric acid, in the presence of alcohol, only part of the cyanogen is liberated as hydrocyanic acid, but that after the precipitation of the potassium, as an acid tartrate, in the presence of a small quantity of water, the subsequent addition of alcohol, or alcohol and ether, yields an acid not deficient in strength; that crystallized cyanide of zinc and potassium may be substituted, with advantage, for cyanide of potassium, being free from deliquescence and tendency to decomposition; that for the preservation of the acid, a common corked bottle is all that is necessary, and probably better than one with a stopper.

A paper, presented by Mr. W. A. Shenstone, had especial reference to the substitution of the double cyanide of zinc and potassium for the officinal acid as recommended by Mr. Towerzey; and also to the suggestion, made by Dr. Tilden, that the officinal acid should be diluted to one-tenth it present strength. With regard to the double salt, the author came to the conclusion that a dilute solution might be regarded as perfectly stable, and provided the consent of the prescriber were obtained, might be substituted for the officinial acid. With regard to the dilute acid it was shown that when of a strength of about 0·2 per cent it might, with ordinary precautions. be preserved unchanged for a considerable length of time. Acid stronger than this gradually lost strength until this point was reached, when it remained of tolerably constant composition.

In a paper detailing the result of a great number of carefully conducted experiments Mr. Louis Siebold stated his experience with the dilute aqueous acid. A quantity of officinal acid was mixed with nineteen times its weight of water, and put into sixteen ounce bottles. Two of these were stoppered, and secured with bladder and stored upon their sides in a cool, dark place. The remainder were also kept in a cool place, but were placed in an upright position, and were opened three times a day, each time for about a quarter of a minute. Their contents were examined and estimated daily, for the first three days, and once a week, during six weeks, at the conclusion of this time the acid had only lost 0.0054 per cent of strength; while the contents of the two bottles which had been carefully tied over, and left undisturbed, exhibited, at the expiration of two months, no appreciable change. On the strength of these experiments Mr Siebold recommends wholesale houses to supply, and retail chemists to keep, a dilute hydrocyanic acid containing one-tenth of a per cent of HCN, of which twenty minims are equivalent to one minim of the B. P acid. This might be conveniently stored in eight ounce bottles. When the strength of the acid falls

to 0·095, which would not be likely to be the case in less than three months, the stock should be renewed.

Mr. Siebold concludes his paper with some very useful and practical remarks on Liebig's method of determining the strength of hydrocyanic acid. These directions cannot be intelligibly condensed, and are therefore reproduced in another part of this JOURNAL.

Mr. J. Williams, who read the fourth paper on this subject, recognized the variable character of the commercial acid, and as a remedy had tried the use of solution containing glycerin. The record of a large number of experiments, in which various quantities of glycerin were employed, was given, and the results were, in most cases, quite favorable. The author did not wish to offer an opinion as to the propriety, medically speaking, of introducing glycerin into hydrocyanic acid, but was simply desirous of determining any preservative effect which the glycerin might possess The experiments extended over three, and, sometimes, four months, and it was found that a solution containing two per cent hydrocyanic acid, and fifty per cent of glycerin suffered very little change during that period—only 0 04 per cent. Aqueous acid kept under the same conditions lost 0.20 per cent. Both these samples were preserved in stoppered bottles, stored in a cool and dark place, and were opened, for the purpose of testing, after the expiration of three months. Samples kept in half-filled, losely stoppered bottles, exposed to light, were also tested, and that preserved with glycerin had had only lost 0 16; while the aqueous acid had falled 0.68 per cent. Stronger acid, representing Scheele's; and also acids ranging from 8 to 16 per cent were also tried. That of Scheele's strength kept tolerably well; but the keeping qualities of the stronger acids were inversely proportional to their strength. Solutions containing 15 per cent glycerin appeared to act as effectively as those of 50 per cent; but the author states 20 per cent the most convenient proportion for use.

The discussion following the reading of these papers was lengthy and very interesting. The general opinion seemed to be in favor of a reduction of strength. Such a change would be attended with but little inconvenience, and, with the evidence at present before us, appears very desirable. All authorities agree that the officinal acid is not to be relied on without the greatest care is exercised in its preservation; and, even under the most favorable conditions, its strength gradually declines. As to the rapidity of this change there is some little difference of opinion, but as to the final result there can be no doubt whatever. In any case the question is an important one, and if dilution of the acid, or the employment of glycerin, or both methods combined, will furnish us with a preparation of constant composition a great point will have been gained, and of this immediate advantage should be taken.

STUDENTS' DEPARTMENT.—The holiday season appears to have had a serious effect on our Students' Department, as, up to the specified time, only three answers have been received. Under these circumstances, we have thought it better to continue the same questions for another month. By the expiration of this time it is to be hoped that our young friends will have again settled down to steady work.

BOOKS AND PAMPHLETS.

THE CHEMISTS' AND DRUGGISTS' DIARY.—Many of our readers are already familiar with this most useful publication, and those who have seen former issues will be in no wise disappointed with the number for 1875—a copy of which is now before us. During the seven years this annual has been in existence its character has materially changed. The publishers have especially regarded the suggestions and wants of business men, and the pharmaceutical almanac and reference book has gradually been merged into the more useful form of a diary. The present issue contains some thirty or forty pages of writing paper interleaved with blotting sheets. This gives space for the ordinary business entries of a diary, and there are also pages for general memoranda, miscellaneous addresses, records of drug purchases, record of pharmaceutical operations, and collection of debts. In addition to this there are many tables very convenient for reference, and much useful information arranged in a concise and handy form. We are not aware of any diary published in Canada which is so well suited to the wants of the chemist and druggist, and we cordially recommend it to the trade.

VICK'S FLORAL GUIDE.—The January number of this illustrated quarterly publication has just come to hand. In point of extent and arrangement it surpasses any of the numbers which have preceded it. To the professional florist it is of great value as giving a list of the most recent additions, while to the amateur gardener, or to the dealer in seeds, it furnishes a descriptive catalogue, which is of the greatest utility. The subscription price of the *Guide* is twenty-five cents per annum—a merely nominal sum, representing but a small part of the cost of publication, but we suppose that, in the end, Mr. Vick manages to come out on the right side. To druggists dealing in seeds we would expressly recommend this periodical.

Editorial Summary.

PRESCRIPTIONS IN 1836 AND 1874.—In the *Pharm. Jour. and Trans.*, Mr. C. Eve institutes a comparison relating to the posological character of a large number of prescriptions dispensed in London during the years 1836 and 1874. From this it appears that very large doses have almost gone out of fashion. While in 1836, 5·5 per cent. of the prescribed medicines were ordered to be administered in two ounce doses, in 1874 we find this percentage diminished to 1·5. One and a half ounce doses declined from 14·0 to 4·5 per cent. Of medicines prescribed in one ounce doses the percentage has increased from 11·5 to 23·6 per cent; half ounce doses from 1·0 to 17·5 per cent.; and doses of one drachm and less from 5·4 to 10·5 per cent. The proportion of two drachm doses is about the same. Of the prescriptions dispensed in 1836 about 40 per cent. were in the form of mixtures; in 1874 the proportion is 58 per cent. Pills have declined from 42 to 32, and draughts from 10 to 1 per cent. Powders appear to have been slightly less popular, as also electuaries, which have diminished to one half their former proportion. The prices of medicines have also declined materially during the past thirty-eight years. Mixtures formerly averaged over 3½*d* per dose; now the average is 2*d*, showing a difference in favor of the purchaser, in 1874, of rather more than 1½*d* a dose.

FORMULA FOR EXTEMPORISING HYDROCYANIC ACID, B. P.—In a paper read before the British Pharmaceutical Conference, to which reference is elsewhere made, Mr. B. S. Proctor gave the following formula for the above purpose:—Water, one ounce; cyanide of zinc and potassium, twenty-two grains; tartaric acid, forty grains. Dissolve the cyanide in the water, add the acid, allow the precipitate to subside; decant the clear liquor, and preserve it in a corked vial. Renew the stock at intervals of three months.

DETECTION OF BEEF FAT OR LARD IN BUTTER.—During a discussion which followed the reading of a paper at the last meeting of the British Pharmaceutical Conference, the author, Mr. Stoddart, described a method of distinguishing between butter and other fats of animal origin. A quantity, say fifty grains, of butter is put into an ounce bottle, half filled with ether, and the mixture is well agitated. If the butter be genuine, perfect solution of the fatty matter

will take place, and salt and water will be separated, together with curd, which is occasionally present to the extent of 8 or 9 per cent. The salt and water may be readily recognized, and the curd may be proved such by heating a small portion on a slip of glass, when it will dry and fall to powder. If beef fat or lard be present, they will not dissolve in the ether, but fall to the bottom of the solution; by the application of heat, as in the case of curd, the fatty character of these substances is at once shown by their liquefaction.

CULTIVATION OF RICINUS COMMUNIS.—An extract from a letter published in the *Phila. Med. and Surg. Reporter* gives the manner in which the crop of castor oil beans is harvested in California. Every day the ripe spikes are gathered by hand, put into sacks, and conveyed to the "popping ground," which is a level space of about half an acre in extent, made smooth and hard like a threshing floor. Here the spikes are spread, and during the day the pods open, throwing out the beans. Next morning the "straw" is raked off and the beans collected. After being cleaned in a fanning mill they are ready for market. By the time the field is picked over a fresh quantity of spikes will have ripened, which are subjected to the same treatment. The harvesting season commences in August. About 1,500 pounds per acre is the usual yield. This, at four cents a pound, gives an average of $60 per acre. The expenses of cultivation were this year about half this sum, but it is expected that in future they will be much reduced.

MIXTURE OF EUCALYPTUS LEAVES AND TOBACCO FOR SMOKING.—It is said that a few eucalyptus leaves mingled with smoking tobacco obviate the disagreeable effects sometimes realized from the excessive use of tobacco. A captain of the French army who, after smoking, experienced headache, vertigo, and considerable abdominal pain, found that by the use of a small proportion of eucalyptus he could enjoy his pipe without suffering afterwards any of these serious inconveniences.

EMULSIO CARNIS.—After numerous experiments with a view to the preparation of an emulsion possessed of moderate keeping qualities, Mr. J. Kemble (*Am. Jour. Pharm.*) found the following formula to answer a useful purpose:—

Fresh raw beef (lean)	Six troy ounces.
Sweet almonds, deprived of their shells and roasted	One troy ounce.
Bitter almonds	Six drachms.
Sugar	Six drachms.
Glycerin	Two troy ounces.
Water	Sufficient.

Rub or beat the beef, almonds and sugar to a fine pulp; add water gradually until a smooth emulsion is formed; strain through a seive or coarse cloth; return to the mortar the residuary mass, and treat with fresh water until fourteen fluid ounces of emulsion are obtained; strain; add the glycerin, and preserve the preparation in a well corked bottle. The dose of this—containing three drachms of beef—is one fluid ounce. In summer the stock should be renewed every three days; in winter the emulsion will keep for a much longer period.

AN ACT TO AMEND THE ACT PASSED IN THE THIRTY-FOURTH YEAR OF THE REIGN OF HER MAJESTY, CHAPTER THIRTY-FOURTH, ENTITLED "THE PHARMACY ACT OF 1871."

Whereas it is expedient to amend the Act passed in the thirty-fourth year of Her Majesty's reign, chapter thirty-fourth and intituled "The Pharmacy Act of 1871;"

Therefore Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

I. Section five of the said Act is hereby repealed and the following substituted instead thereof:

5. Every person desirous of becoming apprenticed to a registered pharmaceutical chemist shall before the term of his indenture commences furnish to the registrar of the college a certificate from the nearest county, city, or town, inspector of schools, or head master of any public or high school, showing that such person has shown a creditable degree of proficiency on those subjects which are prescribed by the council of public instruction as forming the subjects of examination for admission of pupils to high schools or collegiate institutes; or in lieu of such certificate shall pass a creditable examination in such manner as the Council of the College of Pharmacy shall direct, such examination to be known as the "Preliminary Examination;" and shall pay to the registrar the registration fee of one dollar which fee shall be continued annually during the term of such apprenticeship, and shall become due on the first day of May in each year; and said apprentice shall by the

payment of said registration fee be entitled to be enrolled as a student of said college, and shall receive the journal and proceedings of said college; the term of said apprenticeship shall be three years;

Before entering upon the duties of an assistant to any registered pharmaceutical chemist, every apprentice shall present to the registrar satisfactory evidence of his having served said term of apprenticeship, together with an examination fee of four dollars, and shall pass a satisfactory examination before the board of examiners as constituted by the college, such examination to be known as the "Minor Examination," upon which such apprentice shall be entitled to be enrolled as an associate of said college, and shall be considered qualified to dispense the prescriptions of legally qualified medical practitioners; during the period such person acts in the capacity of assistant, either continuously or from time to time, he shall, on the first day of May in each year pay to the registrar the sum of two dollars and shall thereby be entitled to receive the journal and transactions of the college;

Any associate who may be desirous of being registered as a member of said college, or of commencing the business of a pharmaceutical chemist, shall pay into the hands of the registrar the fee of four dollars and shall pass a creditable examination before the board of examiners, such examination to be known as the "Major Examination," upon which such person shall be entitled to be enrolled as a member of the said College and to receive the journal and transactions of said College; and, during the period in which said member may carry on the business of a pharmaceutical chemist, said fee of four dollars must be continued annually, and shall become due and payable on the first day of May in each year;

Every apprentice and assistant engaged in such capacity at the time of the passing of this Act shall, before the first day of May in the year of our Lord one thousand eight hundred and seventy-five, present to the registrar satisfactory evidence that they were so engaged, and shall pay into the hands of the registrar the before-mentioned fees, which fees shall be continued annually as before specified, and the registrar shall enroll such persons as students or associates as the case may be.

II. Section ten of the said Act is amended by adding thereto the following, "and all such persons shall be eligible for election as members of said council."

III. Section eleven of the said Act is amended by adding thereto the following, "but until such first meeting, the retiring council shall continue in office."

IV. Section thirteen of the said Act is amended by adding thereto the following, "and shall also furnish satisfactory evidence of his having served for three years as apprentice, and two years as assistant to a regularly qualified pharmaceutical chemist."

V. Section fourteen of the said Act is amended by striking out the words "of the majority" in the second line thereof, and adding to the said section the following, "and such examiners shall hold office for five years, and in case any examiner shall be absent or unable to attend said examination, the other examiners may appoint a fit and proper person in his stead.

VI. Section fifteen of the said Act is amended by adding thereto the following, "and the registrar is hereby required to collect the fees payable by members and others, and to prosecute all persons in default for one month after any of such fees become due and payable."

VII Section twenty of the said Act is amended by striking out the words "or his employers or employees" in the fourth line thereof, and substituting the words "or a registered associate" in lieu thereof.

VIII. Section twenty-eight of the said Act is hereby amended by striking out the words commencing on the twentieth line thereof and which are as follows, "Provided always that nothing in this Act shall prevent any member of the College of Physicians and Surgeons of Ontario from engaging in and carrying on the business of apothecary, chemist or druggist without registration under the provisions of this Act.

IX All persons holding the diploma or certificate of proficiency, granted by the Pharmaceutical Society of Great Britian or the Pharmaceutical Association of the Province of Quebec, or the Philadelphia College of Pharmacy, and all persons registered under the Pharmacy Act of Great Britain, 1868, shall be entitled to registration as members of the Ontario College of Pharmacy without undergoing examination.

X. From and after the first day of May, in the year of our Lord one thousand eight hundred and seventy-five, it shall be unlawful for any person carrying on the business of a Chemist and Druggist, to employ any apprentice or assistant, unless such apprentice or assistant shall have been registered as provided by this Act.

XI. Any person contravening any of the provisions of this Act, shall be subject to the same fines and penalties as are named in section twenty-five of the Act hereby amended.

XII. All the provisions of the hereby amended Act, inconsistent with the provisions of this Act are hereby repealed, and this Act shall be read as part of the Act hereby amended.

Varieties.

IODISED COFFEE.—Dr. Calvo, the elder, recommends an iodised syrup of coffee containing the following:—

Syrup of coffee.....	500 grammes.
Potassium iodide.....	16 "

Dose.—Two or three spoonfuls each day.

Syrup of coffee is excellent for disguising the taste of iodide of potassium, and makes the use of this valuable remedy agreeable to the sick.—*Chemist & Druggist.*

THE ADULTERATION OF GUM ARABIC WITH DEXTRINE.—To detect this sophistication M. Mussat recommends the use of the microscope. A drop of glycerine placed on a glass slide is sprinkled with the suspected gum. If iodine water is now added, and the examination made with a low power, it will be seen that the particles of dextrine assume a dirty red colour, whilst those of gum become yellowish. Dextrine generally betrays its presence by the peculiar odour which it gives out. This method is more practicable than that which depends on the use of ferric chloride, as indicated by M. Hager, whose process consists in moistening the suspected gum with a solution of this salt in such a way that the gum neither dissolves nor floats on the surface any more than dextrine does. The fragments of gum attach themselves to the bottom of the vessel, unlike the particles of dextrine.—*Chemist & Druggist.*

AN AMUSING CHEMICAL EXPERIMENT.—Place five glasses in a row; pour into the first a solution of caustic potassa, into the second a solution of corrosive sublimate, into the third a small quantity of iodide of potassium and some oxalate of ammonium, into the fourth a solution of chloride of calcium, and into the fifth some sulphide of ammonium. Now pour the contents of the first glass into the second, and a scarlet color will be obtained; next pour the second into the third, and the mixture will be colorless; again pour the third into the fourth, and the contents will be white; finally pour the fourth into the fifth, and the mass will be a dense black. Then you will have had two glasses colorless, one scarlet, one white, and one black.

ANTIDOTE TO CARBOLIC ACID.—A writer in the Dublin *Medical Journal* states that a true antidote to carbolic acid remains yet to be discovered, and some recent experiments of M. Galippe go to discredit the value of saccharate of lime, which has been specially recommended by Kunde, and, from experiments on dogs, he is inclined to place more reliance on olive oil.

WEIGHING THE MOTES IN THE AIR.—To catch and weigh "the gay motes that people the sunbeams," as Milton calls them, would seem at first a wild undertaking for a sober philosopher, but M. Tissandier has attempted and accomplished it. In doing it he has taken advantage of the solubility of gun-cotton in etner, though what that has to do with it the reader might be puzzled to guess until the *modus operandi* is explained. A cubic metre of air is sent through a tube containing gun-cotton. This retains the dust,

and it has merely then to be dissolved in order to get the particles themselves. By this method he has found after heavy rain 6 milligrammes of corpuscles in a cubic metre of air, and as much as 23 milligrammes in dry weather. As to the nature of the dust, organic matter generally formed the third of it, silicious matter another third, the remainder consisting of various matter, including sulphate and oxide of iron.—*Boston Journal of Chemistry.*

SILVERING LIQUID :—

Nitrate silver.....	4 parts.
Dissolve in	
Distilled water	75 parts.
Add	
Chloride ammonium.....	2 parts.
Hyposulphite soda	8 parts.
Prepared chalk.....	8 parts.

Mix, and apply with a chamois, or soft cloth, with friction.
—*Druggists' Circular.*

CAMPHORATED PHENOL.—In a note on this subject the *Campania Medica and Gazetta Medica Italiana-Lombardia*, November 8, after noticing the chemical and therapeutic properties of carbolic acid, Bufalini goes on to speak of its behavior when combined with camphor. In making experiments with carbolic acid for the purpose of preserving animal substance from putrefaction, Bufalini met with a peculiar phenomenon when it was in contact with camphor. When about equal parts of carbolic acid and camphor are dissolved in alcohol, in about twelve or thirteen hours there arises to the surface of the solution a yellowish stratum of oily appearance; it does not mix with the liquid or water, nor is the camphor contained in the alcohol precipitated by water. All this indicates that a chemical combination has taken place, forming a substance which Bufalini calls camphorated phenol. In preparing this compound, Bufalini prefers the two following methods:—In the first, one part of carbolic acid in two of camphor, broken into small pieces, are mixed in a vessel and allowed to stand for some hours, when a reddish-yellow, oily liquid will be formed; this is camphorated phenol, which is purified by washing with co d water. The second method consists in dissolving three parts of carbolic acid in ten of alcohol, and five of camphor in twelve of alcohol, mixing the solution in a wide-mouthed vessel, and allowing the mixture to stand for a day or two; the camphorated phenol rises to the top, and may be removed by simple decantation. Prepared in either of these ways, camphorated phenol is a liquid of oily appearance, reddish-yellow or wine-red in color, having a smell of camphor, insoluble in water, but soluble in alcohol and ether. Regarding its therapeutic uses, the author gives the following as his conclusions: 1. Camphorated phenol produces the same effects as carbolic acid, but is less dangerous. It may be used both externally and internally—*e. g.* in enteric fever and other infectious disorders. 2. It has the power of modifying unhealthy wounds, and of destroying the parasites which are present in certain diseases, as septicæmia, typhoid forms of fever, etc. 3. The medical use of camphorated phenol is to be preferred to that of carbolic acid, as the former does not present the disadvantages of the latter. 4. Camphorated phenol, when applied to the wounds, does not irritate them, or act as a caustic, or disorganizing substance on them; and may be used in large doses without producing symptoms of poisoning.—*London Med. Record.*

ESTIMATION OF MORPHINE IN OPIUM.—*The Amer. Chemist* speaks of Hager's method, as related by Arnoldi, in the *Pharm. Zeit. für Rus.*, as one that had been found to work well, except that one digestion of the opium with lime did not prove quite sufficient. Another method given in the Russian medical pharmacopœia was also found to give satisfactory results. It consists simply in thoroughly exhausting the opium with water, and weighing the insoluble residue, decolorizing the solution of morphine by means of a little animal charcoal, precipitating the morphine by addition of ammonia in slight excess, and weighing. Good opium should not have more than forty per cent. of insoluble residue, and should yield fourteen to nineteen per cent. of impure morphine, precipitated in this way.—*Drug. Circular.*

COLORED INKS.—The following recipes have been well tested and are commended by good authorities as preferable to the solutions of aniline dyes which are now so extensively used as colored inks:—*Green*—Two parts of acetate of copper, one part carbonate of potash, and eight parts water. Boil till half is evaporated, and filter. *Blue*—Three parts Prussian blue, one part oxalic acid, and thirty parts of water. When dissolved, add one part of gum-arabic. *Yellow*—One part fine orpiment, well rubbed up with four parts thick gum-water. *Red*—With the aid of a gentle heat, dissolve four grains of carmine in one ounce of aqua ammonia, and add six grains of gum-arabic. *Gold*—Rub gold-leaf, such as is used by bookbinders, with honey, till it forms a uniform mixture. When the honey has been washed out with water, the gold powder will settle at the bottom, and must be mixed with gum-water in sufficient quantity. *Silver*—Silver-leaf treated in precisely the same manner gives a silver ink. Both these inks may, when dry, be polished with ivory. *Black*—Three ounces crushed gall-nuts, two ounces crystallized sulphate of iron, two ounces gum-arabic, and twenty-four ounces water. *White*—Fine French zinc-white, or white-lead, rubbed up with gum-water to the proper consistency.—*Boston Jour. of Chemistry.*

Registrar's Notices.

LIST OF RENEWALS.—CONTINUED.

Geary, T. J., Sarnia.	Leach, Alfred, Millbrook.
Johnston, James, Harrowsmith.	Monkman, Geo., Barrie.

NEW REGISTRATIONS.

Phillips, Robert, Beachville.	Stratton, Stephen, Ottawa.

ASSOCIATES.

Doherty, Arthur, Caledonia.	Stephens, W. W., Meaford.

Answers to questions in the Students' Department must be addressed to E. B. Shuttleworth, Editor.

GEO. HODGETTS, Registrar.

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 14 @	0 15
Benzoic, pure	0 22	0 2,
Citric	1 40	1 50
Muriatic	0 05	0 06
Nitric	0 11½	0 15
Oxalic	0 22	0 23
Sulphuric	0 03¾	0 07
Tartaric, pulv	0 50	0 50
Ammon, carb. casks	0 23	0 24
" jars	0 23	0 24
Liquor, 880	0 25	0 28
Muriate	0 14	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 40	0 42
Sulphuric	0 50	0 50
Antim. Crude, pulv	0 15	0 17
Tart "	0 55	0 65
Alcohol, 95 per ct.....Cash	2 02	2 05
Arrowroot, Jamaica	0 18	0 22
Bermuda	0 50	0 65
Alum	0 02¾	0 03¾
Balsam, Canada	0 33	0 38
Copaiba	1 10	1 15
Peru	3 40	3 75
Tolu	1 40	1 50
Bark, Bayberry, pulv	0 20	0 22
Canella	0 17	0 20
Peruvian, yel. pulv	0 35	0 50
" red "	1 60	1 70
Slippery Elm, g. b	0 18	0 20
" flour, packets	0 28	0 32
Sassafras	0 15	0 8
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	30 00	30 00
Bismuth, Alb	2 90	3 00
Carb.	3 10	3 25
Camphor, Crude	0 38	0 4
Refined	0 45	0 50
Cantharides	2 20	2 30
Powdered	2 30	2 40
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 23	0 30
Chloroform	1 10	1 55
Cochineal, S. G	0 65	0 70
Black	85	90
Colocynth, pulv	0 60	0 65
Collodion	0 70	0 80
Elaterium oz	3 20	4 00
Ergot	0 35	0 45
Extract Belladonna	1 50	1 60
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	0 00	0 95
Henbane, "	1 70	1 80
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic oz	0 40	0 50
Opium oz	1 80	
Rhubarb	5 00	5 50
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	3 50	4 00
Taraxacum, Ang	0 70	0 80
Flowers, Arnica	0 17	0 25
Chamomile	0 32	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 40	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
Socot	0 50	1 35
" pulv	1 00	0 00
Arabic, White	0 70	0 75
" powdered	0 60	0 75
" sorts	0 24	0 30
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 30	0 42
British or Dextrine	0 13	0 15
Benzoin	0 35	0 75
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 35	0 40
Gamboge	1 40	1 50
Guaiacum	0 45	1 00
Myrrh	0 50	0 85

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	
Scammony, powdered	6 00	6 50
" Virg. "	14 50	—
Shellac, Orange	0 80	0 85
Gum, Shellac, liver	0 60	0 70
Storax	0 40	0 45
Tragacanth, flake	1 10	1 75
" common	0 53	0 65
Galls	0 22	0 30
Gelatine, Cox's 6d	1 15	1 20
Glycerine, common	0 21	0 30
Vienna	0 9	0 30
Prices	0 60	0 75
Honey, Canada, best	0 15	0 16
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon	1 75	1 80
" & Quinine, oz	0 57	0 58
" & Strychine	0 20	0 25
Sulphate, pure	0 08	0 10
Iodine, good	5 00	5 50
Resubiimed	6 50	7 00
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 32
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I.	0 14	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 17
Lime, Carbolate brl	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12
Lead, Acetate	0 15	0 16½
Leptandrin oz.	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 50	1 60
Liquorice, Solazzi	0 5	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 60	0 75
Mercury	2 20	2 30
Bichlor	2 00	2 10
Chloride	2 35	2 45
C. Chalk	0 95	1 00
Nit. Oxyd	2 0	2 50
Morphia Acet	5 25	5 35
Mur.	5 25	5 35
Sulph	5 40	5 50
Musk, pure grain oz	25 00	—
Canton	0 60	1 20
Oil, Amonds, sweet	0 40	0 45
" bitter	14 00	15 00
Aniseed	4 00	4 25
Bergamot, super	7 50	7 75
Caraway	3 20	3 50
Cassia	2 00	2 25
Castor, E. I	0 15	0 17
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 05	1 15
Cloves, Ang	3 50	3 75
Cod Liver	1 25	1 50
Croton	1 75	2 00
Juniper Wood	0 80	1 00
Berries	2 75	3 00
Lavand, Ang oz.	0 00	1 00
Exotic	1 25	1 50
Lemon, super	3 80	4 00
ord	3 20	3 40
Orange	3 00	3 25
Origanum	0 65	0 75
Peppermint Ang	15 00	16 00
" Amer.	5 50	6 00
Rose, Virgin	8 50	8 75
" good	7 00	7 25
Sassafras	0 75	1 90
Wintergreen	6 00	6 50
Wormwood, pure	4 00	6 00
Ointment, blue	1 60	1 70
Opium, Turkey	9 75	10 00
pulv	00 00	12 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass	1 60	1 65
Potash, Bichrom	0 18	0 20
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 40	0 45
Nitrate	8 00	9 00
Potassium, Bromide	85	0 90
Cyanide	0 75	0 80
Iodide	3 80	4 00
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 40	—
Houghton's doz.	8 00	9 00
Morson's oz.	0 85	1 10
Phosphorous	1 10	1 20
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 20	—
" 100 oz. case.	2 17	—
" 25 oz. tin.	2 17	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 08	0 10
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	1 50	1 60
Jalap, Vera Cruz	90	1 15
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	1 75	2 00
" E. I.	0 75	0 90
" " pulv	1 60	1 10
" " 2nd	0 60	0 70
" French	0 75	—
Sarsap., Hond	0 53	0 60
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 00	1 10
Spigelia	0 25	0 30
Sal., Epsom	2 25	3 00
Rochelle	0 31	0 35
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 05	0 06
Cardamon	2 00	2 10
Fenugreek, g'd	0 08	0 09
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	0 75	0 85
Spanish	12 00	13 00
Santonine	7 50	8 00
Sago	0 08	0 09
Silver, Nitrate Cash	14 85	16 50
Soap Castile, mottled	0 11	0 14
Soda Ash	0 03¾	0 05
Bicarb. Newcastle	5 75	6 25
" Howard's	0 14	0 16
Caustic.	0 05½	0 05¾
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 00	2 20
Sulphur, Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 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
Aniline, Magenta, cryst	2 50	2 80
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09½	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 85	0 90
Extract	0 26	0 30

DYESTUFFS—*Continued.*		
Japonica	0 07	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 01¾	0 03
Logwood, Camp	0 01¾	0 03
Extract	0 9½	0 12
" 1 lb. bxs	0 13	—
" ½ lb. "	0 14	—
Madder, best Dutch	0 11	0 12
2nd quality	0 10	0 11
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 11½@	0 12
Cassia	0 26	0 28
Cloves	0 60	0 65
Cayenne	0 22	0 28
Ginger, E. I.	0 19	0 20
Jam	0 30	0 30
Mace	1 50	1 60
Mustard, com	0 20	0 25
Nutmegs	1 15	1 25
Pepper, Black	0 22½	0 23
White	0 31	0 32
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 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07¼	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 07	0 08
Umber	0 07	0 10
Vermillion, English	2 10	2 20
American	0 25	0 35
Whiting	0 1¼	0 02
White Lead, dry, gen	0 08½	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 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 35	—
" No. 1	2 10	—
" No. 2	1 85	—
" No. 3	1 60	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	4 10 @	4 50
Rosin, Strained	3 80	4 25
Clear, pale	5 75	7 25
Spirits Turpentine	0 50	0 52
Tar Wood	4 40	4 50
OILS.		
Cod	0 6 @	0 70
Lard, extra	1 10	1 20
No. 1	1 05	1 10
No. 2	0 85	0 90
Linseed, Raw	0 67½	0 70
Boiled	0 72½	0 75
Olive, Common	1 05	1 10
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 75	0 75
Straw	0 68	0 70
Sesame Salad	1 30	1 35
Sperm, genuine	2 55	2 60
Whale refined	0 70	0 75