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CANADIAN

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Original and Selected Papers.

ON THE PREPARATION OF MEDICATED WATERS.*

BY JAMES RUAN, G. P.

I desire to present to the consideration of the readers of the Journal the following suggestion for the preparation of the different medicated waters of the U. S. Pharmacopœia which call for the intervention of magnesium carbonate in their preparation; the substance which I suggest to take the place of the latter is paper pulp, prepared from chemically pure filtering paper.

The following is the "modus operandi," which I find yields very satisfactory results:—

To prepare Aqua Menthæ Piperitæ—

Take of the Oil of Peppermint, half a fluidrachm.
Chemically pure filtering paper, one drachm.
Distilled water, two pints.

The paper is cut into small pieces and beaten up in a mortar with one ounce of water gradually added until reduced to a pulpy consistence; the oil is then added and triturated with the pulp until incorporated; fifteen ounces more of water is to be gradually added;

*From the *American Journal of Pharmacy*.

the whole is then poured into a suitable sized bottle, the mortar rinsed out with the remaining pint of water, which is added to the first. The whole is then to be well shaken and then filtered through paper.

In the same manner prepare other aquæ medicatæ, which call for the intervention of magnesium carbonate. Peppermint water, prepared as above, is strongly impregnated with the oil, and beautifully transparent. Some which I had prepared over three weeks is still clear, with no appearance of sediment or separation of the oil.

Aqua Cinnamomi, prepared by the above process, is perfectly colorless, with the odor and taste strongly defined.

In the preparation of the waters by the above process, it is well to allow them to stand a few hours before filtration, occasionally shaking so as to thoroughly disseminate the pulp through the water, thereby giving the water greater surface to act on. I think the waters prepared according to the described manner equal to the distilled. The filters can be reserved for making additional pulp. I am not aware that the process I have described has been used before, and as the results have been so satisfactory in my case, I thought I would present the process to the Journal for publication.

I have prepared Aqua Camphoræ by the same process, first reducing the camphor to fine powder by alcohol, and proceeding as with the others.

Philadelphia, March 19, 1874.

THE BRITISH PHARMACOPŒIA ADDENDUM.

BY C. UMNEY.

(*Continned from page* 401.)

Laricis Cortex is ordered for the production of tincture of larch bark, not altogether unknown in pharmacy. At the present time two or three spurious larch barks are to be found in trade. I have not had an opportunity of comparing them, but Mr. Holmes has kindly done so, and reports that the specimen (B) closely corresponds with that in the Society's Museum.

Liquor Gutta-percha.—This solution is introduced as a vehicle for the powder of black mustard in making the Charta Sinapis.

The formula is identical with that given in the recent edition of the United States Pharmacopœia. If gutta-percha is of good quality and thinly cut, as the Phamacopœia directs, its solution is most easily effected.

The carbonate of lead acts as a mechanical purifier, and answers the purpose excellently well.

Had benzol been officinal, doubtless it would have replaced chloroform in this preparation.

Liquor Magnesiæ Citratis is introduced as a preparation containing true citrate of magnesia, and is made by a modification of the French Codex process for purgative lemonade. The carbonic acid is generated from acid carbonate of potassium; the Codex directs the use of the corresponding soda salt. The water thereby charged with carbonic acid is under less pressure than in the ordinary lemonade of trade, which contains generally when filled from a machine 2·5 atmospheres of gas. This liquor would not contain more than 1·5 atmospheres in addition to the quantity dissolved by the water. There is just sufficient to make it grateful, and not too much to prevent it from being easily taken as a draught. I should have preferred to have seen half a fluid ounce of simple syrup with half a drachm of tincture of fresh lemon peel, ordered for each half-pint bottle, rather than syrup of lemon, which has, to my palate, a mawkish taste.

Oleum Phosphoratum is made with almond oil, which is first directed to be heated to 300° Fahr., and maintained at that temperature for fifteen minutes. Now, in some cases such treatment of the oil may be necessary, but I have not noticed either water or albuminous matter in the almond oil with which I have experimented. Almond oil readily takes up the phosphorus when the required temperature of 180° (Fahr.) is maintained. The oil now officinal differs in strength from the phosphorated oil of the Codex, which contains 2 per cent. Presuming the specific gravity of almond oil to be ·920, then ·74 will be the percentage of phosphorus. Surely a one per cent. solution would have been preferable. I do not consider the description of "colourless" as correct for this liquid. I should describe it as straw-colored.

Pepsin.—At last this preparation is made officinal, and a standard published by which the value of medicinal pepsin can be determined.

How much of the pepsin of trade will come up to the officinal test, is a matter of speculation.

I have prepared pepsin from fresh rennets, but have not yet had an opportunity of experimenting upon pepsin, either from pigs' or sheeps' stomachs.

It is imperative that the directions of the pharmacopœia as to washing, be strictly adhered to; and I should say, profiting by a failure I had on the first occasion, the scraping even of the stomach is a matter of importance, for a material point seems to be the sufficiently light scraping in order that the fatty matter be not removed with the viscid pulp, which is finally converted into a solid form by desiccation at a temperature of 100° Fahr. The powdering of the

gelatinous-looking pellicles is a matter easily to be accomplished, the result being "a light yellowish-brown powder, having a faint, but not disagreeable odor, and a slightly saline taste, without any indication of putresence."

The determination of its value by its solvent action upon fifty times its weight of coagulated egg albumen aided by a minute quantity of hydrochloric acid is, I believe, in the main, correct. That the albumen will dissolve there can be no question; the time mentioned, viz., four hours, seems to me for, at any rate, pepsin from the stomach of the calf to be rather too short. The experiment I made took a longer time; it is, however, just possible that pepsin made from a pig's stomach may have a more rapid action upon albumen.

Pilula Phosphori.—Phosphorus is not one of the most manageable bodies to convert into a form suitable for administration and easy dispensing. We must not, therefore, be surprised if some complaints are made upon the practicability of the method for preparing this mass. My experience in making phosphorus preparations has been limited. I will therefore merely say that, as far as I can judge, the directions accompanied with considerable care and patience give a very satisfactory result. To make the wax thoroughly incorporate with the balsam of tolu and phosphorus is the part of the process that seems most tedious. Upon a quantitative experiment I have made I find when operating upon about half a pound of the ingredients that the weight is finally increased about 13 per cent. on account of the water absorbed by the mass during the immersion and manipulation. This hydration, therefore, will give an amount of phosphorus present in the completed product equal to about 1 per cent.

Pilula Scammonii Composita is the non-aloetic cathartic mass promised to be inserted in the Appendix. It is to be supposed that the curd soap here ordered will replace the olive oil soap in most preparations in which the latter is now prescribed in all future editions of the Pharmacopœia. The use of spirit as a solvent, combined with strong tincture of ginger, leaves little to be desired as far as the production of an elegant mass is concerned; but the process is rather an expensive one, and the essence of ginger might have been replaced by the oleo-resin of ginger (or gingerine as it is called in trade), now officinal in the United States' Pharmacopœia, which would in this case have answered the purpose exceedingly well.

Pulvis Elaterii Compositus commends itself immediately as a safe and ready means of dispensing elaterium.

Pulvis Glycyrrhizæ Compositus is somewhat different to the compound liquorice powder we have been accustomed to see prescribed latterly, which was that of the Prussian Pharmacopœia, containing, in addition to the British Pharmacopœia ingredients,

sulphur and fennel fruit; doubtless those in charge of the work have strong reasons for rejecting the sulphur.

Sapo Animalis.—The introduction of this soap into the Pharmacopœia is a wise step, even if only to authorize a practice common with manufacturers, who have been fully cognizant of the objections to the olive oil soap of the Pharmacopœia for some years. The remark, that "this soap may with advantage be substituted for the hard soap made with olive oil in preparing Linimentum Potassii Iodidi cum Sapone" is not in the least too strong, for it is absolutely necessary, if anything approaching a good liniment be required, that the officinal olive oil soap be discarded. How manifest is the disadvantage under which the compilers labour in having to publish an appendix only, without revision of the text of the old work; for a parallel can be found for this remark upon the soap over and over again in looking through the Pharmacopœia and comparing it with the work of certain pharmacists upon certain subjects to which they have given their attention since the 1867 edition was introduced, but which cannot appear because of material alteration that would be necessary in the text.

Succus Belladonnæ belongs to a class of preparations which have for years been in some demand; they are really valuable, and as a rule are much more to be relied upon than solid extracts. Of course a hard and fast rule cannot be laid down as to the relative equivalent value of this or other juices as compared with the original plant or with the extract, but the following, I think, will nearly express the average ratios:—

Belladonna Herb, fresh.....	100 parts.
Expressed juice	60 "
Solid Extract	4·7 "

Succus Hyoscyami, the same remarks apply as to the preceding juice, but, perhaps, here to a stronger degree upon the greater objection to evaporation, for I am of opinion that expressed juice of henbane suffers considerably in evaportion, for the production of the solid extract.

The relative equivalent values of herb, juice, and extract, will probably be as under—

Henbane Herb, fresh	100 parts.
Expressed Juice.....	70 "
Solid Extract	4·4 "

These expressed juices seem to have a specific gravity of about ·990 to ·997.

Suppositories.—My experience in the manufacture of suppositories is very small. Martindale, Gerrard, and other practical men can speak more authoritatively upon the subject than I can; doubtless they will give us the benefit of their observations in manipulating the three soap suppositories.

The irritant nature of the soap upon surfaces with which it comes in contact, is purely a medical question, and does not concern us.

The *Carbolic Acid and Soap Suppository* does not work well, the quantity of moisture being alone derived from the carbolic acid seems to me insufficient, at any rate it will not admit of starch being used. To make these easily I should take equal parts of curd soap and curd soap in powder.

The *Suppository of Morphia and Soap* is easily manipulated, the quantity of starch added being sufficient to make the suppository finally weigh 16½ grains.

The *Suppository of Tannic Acid and Soap* is also easily made, the amount of starch added being sufficient to make the suppository weigh upwards of 23½ grains.

The two latter suppositories on exposure to damp air, might be expected to become slightly adhesive from the use of the hygroscopic body glycerine.

Syrupus Chloral.—The administration of hydrate of chloral in the form of a syrup has been general during the past two or three years. When it was first used in this form the variously flavored syrups were numerous, amongst them might be enumerated orange peel, orange flower, peppermint, tolu, ginger, chloroform water. It would have been well if at the evening meeting, some two or three years since, when it was proposed to settle the question of the best vehicle for its administration that the matter had been decided; the syrup would not then have been sent through the country broadcast made from half a dozen different formulæ, but a recipe would have appeared in the Journal as having had the approval of the meeting, and would consequently have carried some weight with it. It would seem that this difficulty beset the Pharmacopœia Committee, for they have finally settled upon simple syrup, hoping by its adoption to prevent all chance of giving offence to one or other who have held that such and such a flavoring was the most elegant.

All this is very good, and under the circumstances is, perhaps, the best solution of the difficulty that could have been devised, and I admire it. I cannot say as much for the elegance of the syrup itself, for to a pharmacist's eye, it is anything but a syrup.

The formula given contains too much water for the solution of the hydrate before the simple syrup is added, the resulting compound being thin and certainly unparalleled in density by any other officinal syrup. When prepared according to the Pharmacopœia formula the spec. grav. will be 1·218. I should certainly suggest that when an opportunity occurs for a revision, we should be directed to dissolve the hydrate in about its own weight of water and then add simple syrup, thus—

Hydrate of Chloral	80 grains.
Water	1½ drachms.
Syrup to	1 fluid ounce.

The spec. grav. of such a syrup would be 1·320 and would be an improvement, at any rate pharmaceutically, upon the now officinal syrup. It may be that there are some who are so fastidious that they object to the taste of sugar—if that be the case let a solution in water only be made officinal—of an equivalent strength to 10 grains to the drachm.

Tinctura Aurantii Recentis is an old friend, for grey-haired pharmacists will remember that a tincture from the fresh peel, although not of equivalent strength to the present, was officinal in the 1824 pharmacopœia, and was discarded for reasons best known to the compilers of the 1836 edition. We are certain they did not then cherish the now popular notion of conservatism, or they would have retained the formula for the present race of pharmacists, who, perhaps, wish they had done so, rather than they themselves should be accused of retrograde pharmacy. The subject was revived before this Society at an evening meeting, by Haselden, as one worthy of attention. (PHARM. JOURNAL, Nov. 9th, 1872.) The discussion upon this paper, in which Bland, Brown, Greenish, Groves, Sandford and Umney took part (PHARM. JOURNAL, Nov. 9th, 1872) went to show as follows :—

Bland.—"*That tincture of dried peel was a bitter, while tincture of fresh was a flavor only.*"

Brown.—"*That upon no account would he use rectified spirit.*"

Greenish.—"*That Continental pharmacists used dried peel and double strength.*"

Groves.—"*That he had experimented upon all peels, and finally came back to the recently dried by preference.*"

Sandford.—"*That he had used a tincture approximating to the 1824 tincture.*"

Umney.—"*The difficulty there would be at certain times in procuring fresh Seville orange peel.*"

The result of this discussion apparently would not have been the introduction of this tincture if these pharmacists had a voice in the matter. Symes (PHARM. JOURNAL, Nov. 9th, 1872, p. 381) also remarks upon this tincture, and suggests the addition of as much water as with the water in the peel, would bring the spirit to proof strength, but none of these experimenters seem to have fallen into the error the British Pharmacopœia has in the manipulation there directed.

We are told to macerate the 6 ozs. of orange peel in one pint of rectified spirit for a week with frequent agitation. Then press the dregs, mix the products, and make up the measure to one pint with rectified spirit.

The introduction of the word "pint" into the text is evidently an error, and seems to have crept in inadvertantly, for we are directed only a few lines previously to take a "sufficiency" of spirit, which remark would have been unnecessary, or at any rate contrary

to custom, if a pint had been intended. I have had an opportunity of making this tincture during the past fortnight, and have found rather than spirit being required to make up any deficiency resulting from loss, there is actually a gain of about 10 per cent. by volume. The formula should, therefore, be amended thus:—

Take of—

Bitter Orange. A sufficiency.
Rectified Spirit. 18 fluid ounces, or a sufficiency.

Carefully cut from the orange the colored part of the rind in thin slices, and macerate six ounces of this in 18 fluid ounces, etc., etc. Finally, add sufficient spirit to make one pint.

I would remark that my observations confirm those of Haselden and Symes, that fresh peel is to dry peel as 100: 33:3.

Tinctura Laricis has previously been but little used; when it has, the tincture has generally been made with proof spirit. With the bark in a proper state of division, percolation is admirably adapted for the production of this tincture. The loss of spirit I have noted in making it by the officinal method is about 10 per cent. by volume.

Tinct. Quiniæ Ammoniata has been seldom heard of previously. The formula given is one that has appeared in the PHARM. JOURNAL, and has doubtless been adopted by those who have had occasion to prepare the solution. The specific gravity noted is ·936. One fluid ounce of this tincture, when evaporated to dryness over a water bath, re-dissolved in one fluid ounce of water, and ammonia cautiously added in slight excess, will give a precipitate, which, when dried until it ceases to lose weight, will weigh not less than 5·6 grains.

Two preparations are conspicuous by their absence. I refer to the acetum and oxymel of ipecacuanha. These were introduced to us by Dr. Duckworth, and working processes given by Carteighe, and over and over again they were said to be destined for the addendum.

What has become of them? Is it possible that they kept perfectly up to a certain time, and then suddenly went the way of all ipecacuanha preparations. I imagine that this must have been the case, for we heard of them at every meeting at which the additions to the Pharmacopœia came under discussion, and finally they are shut out.

I would submit that if these have been found unstable, an aceto-alcoholic fluid extract be prepared and investigated, with a view to its use in future editions, either as a fluid extract, or more generally for a syrup, by dilution of the fluid extract with simple syrup.

In conclusion, I would now review the first page, entitled, "Corrections made in 1874 in the Reprint of the British Pharmacopœia of 1867."

The only important correction is the specific gravity of the strong solution of perchloride of iron, which was formerly stated to be 1·338, now to be 1·440, which is, I believe, nearly accurate.

The tincture made by diluting this liquor with rectified spirit, and for which a specific gravity was named in the previous print, has been deemed either accurate or unworthy of correction.

The list in the main consists of the proportions of active ingredients in various more or less potent preparations. Up to the present time I have not had an opportunity of checking these calculations.

I would, however, point out one anomaly in which ipecacuanha and opium, both of which are in the ratio of one in ten in Dover's powder, are said to be respectively as one in twenty-four and one in twenty-three and a half, nearly, in compound pill of ipecacuanha and squill.

While I sympathize with the compilers in the difficult task they have had in making corrections without disturbing the text of the old print, to which point I have previously alluded, still, I cannot refrain from expressing my humble opinion that as corrections, almost the whole of which are immaterial, have been made, while more important points have been allowed to remain unassailed, it would have been better had that list never been published.

When the novelty of this book has passed away, we shall look forward to a new edition of our National Pharmacopœia, which will doubtless bear a decennial revision. In the meantime, let it be not only the ambition but the bounden duty of every pharmacist to make some research, no matter in what direction, if it bears upon pharmacy, and give this Society the benefit of his observations; by this, and by this only, shall we be enabled to keep pace with pharmacists on the Continent and in the United States, and what is of more importance, show to the medical profession that we are fully alive to the responsibilities of our calling.

Laboratory, 40 Aldersgate Street, E.C.

FISH OILS USED AS MEDICINE.

The *Chemist and Druggist* contains a paper, by Mr. P. L. Simmonds, on the fish oils of commerce, from which the following extract relating to those oils which are used in medicine is made:—

In Russia, among the accessory products obtained from various species of fish, oil is one of the principal, amounting in value to about half a million of roubles. This oil has three different uses—for medicine, for food, and for industrial purposes. Its source or origin is also threefold, according to the part of the fish

in which it is chiefly concentrated. In some species, as, for example, in the cod, it is obtained exclusively from the liver; in others, as in the "sandre," the fat surrounds the intestines, the rest of the body in these fish never being fat; but in the larger number of species, as the herring, the salmon, and the siluroids, it penetrates all the frame. According to these differences in the distribution of the fat in the body of the fish, as well as the use to which the oil is to be applied, the mode of extraction varies. The cod-liver oil for medicinal use is extracted from the livers cut into pieces while they are still fresh, and submitted to the action of heat in a steam bath. This method has only been introduced of late years on the coast of Lapland, on the initiation of the Minister of Works of Russia, who offered rewards to those who followed the better method pursued in Norway, to which publicity was given. The invitation was readily responded to, and from one fisherman alone the Government buys 15,000 lbs. to 20,000 lbs. of cod-liver oil for use in the hospital. The fish oil which is intended for food is obtained principally from the fat which surrounds the intestines of different species of sturgeon and the "sandre;" these are heaped together, washed, and melted by heat. This oil is added to caviare, which of itself is not considered sufficiently rich in fat, and is also used at the seat of production, in place of vegetable oil, by the workmen on fast days.

Very good medicinal cod-liver oil is now made at St. Pierre, Newfoundland, by the French, and it forms a considerable article of commerce, its production having been encouraged by the French Academy of Medicine, who state the brown, pale, and bleached oils made there will compete favourably with the products of the Norwegian and English factories. That made in April, May, and June is the best, the livers being then leaner; later, when they are fat, the oil is not considered so good in a therapeutic point of view.

I have noticed the following mode suggested of making cod-liver oil palatable:—Take equal parts of ground coffee and bone-black, as used by sugar refiners, mix them in ten times their combined weight of cod-liver oil, and digest for half an hour at a temperature of about 130° Fahr.; then place the mass on a filter and drain the oil off, and you will have its nauseous taste changed into a pleasant coffee flavour. If the notion is correct that coffee is an antidote of iodine, and as the latter is one of the active ingredients of cod-liver oil, it may be well to let the patient use some iodine preparation at the same time, or to add a little iodine syrup to the deodorised cod-liver oil.

In Norway, the cod fish at the early part of the season are rich in liver, so that from 250 to 300 of the net-caught fish yield a barrel of liver, while 50 to 100 more fish taken on lines would be required. As the season advances the fish may become perceptibly poorer,

from 400 to 450 being required to fill a barrel, while on the seaboard or western side of the Lofoden Islands from 600 to 700 livers are requisite. On the whole, therefore, it may be assumed that an average number of 450 livers are required to the barrel.

The total produce of cod-liver oil from the Norwegian fisheries in 1869 was estimated at 19,000 barrels—200 barrels were prepared as medicinal cod-liver oil. Fresh livers for medicinal oil fetched from 27s. to 31s. per barrel, old livers from 22s. to 26s. The catch of each boat varies from eight to twenty barrels of liver.

From the coast of Norway the average export of fish oil from 1851 to 1855 was 52,900 tuns, and from 1856 to 1860, 59,617 tuns per annum.

The produce of the French cod-fishery imported in 1860—which was a fair average of the five years previous—was as follows: Cod oil, 2,050,846 kilogrammes; cod oil, not purified, 284,649 kilogrammes. From St. Pierre and Miquelon about 500,000 kilogrammes of cod oil are shipped annually.

In the United States a large quantity of fish oil is made from the menhaden (*Alosa menhaden*). Long Island, Connecticut and Rhode Island produced in 1870 about 1,400,000 gallons, and the business in the State of Maine is also large. Six factories in Long Island use up every week about 2,000,000 fish. The manufactories are nearly all worked on different plans. Some use large tanks, in which the fish are placed, and into which steam is forced. A portion of the oil is extracted, and coming on the surface of the water, is skimmed off; the water is then drained away, and the refuse is pressed by hydraulic presses or powerful levers. In another mode of working used by one manufactory, the fish are placed in a large iron cylinder, similar to a boiler, and steam is let in at a given pressure, while the cylinder is made to rotate by a steam-engine. The fish are steamed from twelve to fifteen minutes, then turned out, and subjected to hydraulic pressure, which, of course, extracts oil and water together. This runs through pipes into tanks, where the oil rises to the surface, and is taken off A thousand fish yield on average about thirteen or fourteen gallons of oil, though this depends largely on the season, and the good or bad condition of the fish. The uses to which this oil is put are very numerous It is good for table purposes, and, when properly prepared, the best kind is extensively used under the name of "olive" oil. It is a good paint oil: (?) much of the linseed oil sold in America has a large amount of menhaden oil mixed with it. It cannot, however, be used for lubrication, owing to the rapidity with which it absorbs oxygen and "gums."

From the ool-a-chan, or houlican, a small transparent fish like a smelt, the Indians of Vancouver obtain an excellent oil, which is used for the same purposes as cod-liver oil, and with as much, if not greater, benefit. The oil when cold is of the consistence of

thick cream, white in colour, but with little odour, and by no means unpleasant to the taste; in fact, those who use it very quickly acquire a partiality for it. The Indians make large quantities every season, and with them it supplies the place of butter. They cannot live without it, and it forms a great article of trade. They prefer it rancid. It is a notorious fact that the Indians are subject to spitting of blood and consumption, but still live to a great age. How much has the oolachan oil to do with the prolongation of their days?

The houlican is somewhat larger than the sprat, and is so full of oil that it is said that those caught in the north will burn like a candle. The oil is obtained by merely immersing the fish in a small quantity of water and applying heat. The oil is then skimmed off, and when properly filtered is a very pellucid oil of a delicate pale yellow colour.

Among the fish oils, and other oils, locally obtained or met with in the East, are, at

Madras. Karahmanoo oil, from *Polynemus plebeius* and *P. uronemus*: skate oil, serinei oil (shark liver).

Bohet fish liver oil, oil from the loggerhead turtle (*Caouna dioacea*, Esch.).

Patna. Porpoise oil.

Calcutta. Fish maw oil; Joree and Seephoo oil.

In the Archipelago. Muria ekam fish oil.

On the Western and Malabar coasts an oil is prepared which is supplied to the hospitals for the use of the troops: this, in many cases, is obtained from the liver of the skate or ray, saw fish, cat fish, seer and white shark indiscriminately. From analysis and experiments, it has been found to equal in its medicinal properties the best cod-liver oil, but from its disagreeable taste and odour it could never supersede that oil. At Kurrachee, large quantities of fish liver are prepared, but it is not so well made as at Malabar and Calicut.

NEW THERAPEUTIC REMEDIES.

(Continued from page 364.*)*

III.—*Alcoholic Compounds.—Nitrate of Amyl.*—This liquid is the second example only of an organic nitrite being utilized in medicine, the other being nitrite of ethyl—the essential constituent of the old and well-known "sweet spirit of nitre." *Nitrate* of ethyl or *nitric* ether proper, is a heavier liquid than nitrate of ethyl, and does not appear well adapted for practice, on account of its irritating tendency.

This amylic nitrous ether was discovered by Balard in 1844, more fully investigated by Guthrie in 1859, and again more thoroughly still by B. W. Richardson in 1863–64. We cannot doubt that we have here an agent of at least very remarkable and energetic powers, while it is noticeable that the morbid conditions in which the drug has been found serviceable were pointed out before it was used in practice. As a powerful and rapid modifier of the action of the heart, and as an extraordinarily active means of relaxing arterial tension, it stands alone; and with too scanty experience to pronounce positively on its precise powers for good or evil, we cannot mistake the prompt and effectual relief which it has in several cases given to the agony of angina pectoris and the paroxysms of spasmodic asthma. No doubt some serious consequence, such as troublesome headache and alarming prostration, have occurred after its use, but we should remember that much of the amyl nitrite, as sold, is very impure, and, in addition to not inconsiderable quantities of prussic acid, if liable to contain other organic compounds, *e.g.*, aldehyd and ethyl-amylic ether, which must interfere with its proper action. Unlike nitrite of ethyl, it does not appear to suffer decomposition by keeping.

Bromal, Chloral, Croton-Chloral.—Of these three bodies I may say, in brief, that ordinary or ethylic-chloral has secured for itself a firm position in medical practice; bromal offers little promise of utility; and croton-chloral is just entering upon its trial. They are all strictly analogous bodies, and are respectively the bromine or chlorine derivatives of aldehyds. Bromal is brominated ethylic (common) aldehyds; chloral is chlorinated aldehyd: and croton-chloral is a chlorinated derivative of crotonic aldehyd, *i.e.*, of the aldehyd of crotonic acid, a constituent of croton oil.

Bromal is prepared in a manner similar to that used for chloral, viz., by the action of bromine on alcohol. It is a colorless, oily liquid, sp. gr. 3·34, boiling above 212°, and, like chloral, forming with water a solid definite hydrate. It was discovered by Lowig in 1832. The hydrate $=C_2HBr_3O,2H_2O$ (Watts). When administered to the lower animals (frogs, rabbits, and guinea-pigs) in doses of from 2 to 15 grains, the principal symptoms produced are irritation of the air passages, restlessness, followed by imperfect sleep, and anæsthesia, and finally dyspnœa and death, either with or without convulsions. It has been given to man in a few cases of disease —viz., epilepsy, tabes dorsalis, and aortic valve disease, in doses of ⅓ to 1½ grains and upwards. It is soluble in six parts of water. It it evidently possessed of considerable activity, for 1 grain has, in the human subject, produced unpleasant results, and 4 grains have caused great depression and severe pains in the stomach. It seems unlikely to prove useful either as a hypnotic or as an anæsthetic. It is too irritant, and does not appear to offer any advantages as a

therapeutic means over other safer and speedier remedies. It is stated to be barely supportable in an emulsion containing 1 in 300.

Chloral.—Of this now so familiar drug I would only say that it, as well as bromal, supplies us with a fresh warning to take heed not to push chemical analogies too far when dealing with the phenomena of life, and we shall only be led astray by regarding the stomach as a warm test-tube, in which the chemist can work out his problems as unerringly as in the laboratory. Because chloral is decomposed by strong alkalies, or their carbonates, in accordance with a well-known reaction, into chloroform and formiate of the base, the specious theory was promulgated that the action of chloral was thus simply explained, and that it, in fact, was nothing else than the action of nascent chloroform gradually evolved within the system.

Although this theory has met with and still finds general favor, it has, in my opinion, no valid support, and cogent chemical and physiological arguments can be arrayed against it. I think it should be held that chloral exercises a specific action of its own upon the organism, which is not to be reasoned out from an exclusively chemical basis.

It is interesting to recall that the discovery of chloral preceded that of chloroform, for it was in 1832, while studying chloral, which he had just discovered, that Liebig for the first time met with chloroform.

Other varieties of chloral, *e.g.*, amylic and propionic, are known to chemists, and probably an indefinite number of chlorals could be obtained by suitable means. Liebreich, the introducer of ordinary chloral, has suggested a new chloral, which is possessed of some remarkable properties. To distinguish it from its predecessor, it is termed *croton*-chloral, *i.e.*, the chloral of the crotonic series. Dr. Hoffman found that some of the German chloral contained more or less of crotonic chloral, and its origin is accounted for in this way:

The alcohol from which ordinary chloral is made in Berlin, by the action of dry chlorine on absolute alcohol, is purified by passing it over charcoal. Hence, by oxidation, some ethylic aldehyd is formed. This, when acted upon by the hydrochloric acid liberated in the reaction, suffers dehydration, and yields crotonic aldehyd—$2C_2H_4O—H_4O=C_4H_6O$; and this new aldehyd, acted upon by the chlorine gas, furnishes the new chloral, $C_4H_3Cl_3O$.

Most agents which act upon the nervous system affect it generally, or at least engage in their sphere of action several important tracts. At the same time we possess some active drugs which exhibit a remarkable determination to particular areas, *e.g.*, conium, curare, &c., and in this new compound, croton-chloral, we meet with a body which exerts a specialised and singular action upon a very limited nervous region.

When administered to animals it produces, first, anæsthesia of the head, then loss of reflex movements throughout the body, and

finally death by paralysis of the medulla oblongata. In man, however, when given in small doses, it produces anæsthesia of the fifth nerve, and of that alone, while the sensibility of the body generally and the pulse and respiration remain unaffected. This singling out of an individual nerve will, if confirmed, stand alone, and is a curious and suggestive phenomenon.

Hydrate of croton-chloral closely resembles in appearance the ordinary chloral. It may be prepared by passing chlorine gas into allyene, or by acting upon dichlorallyl and formic acid with alkalies.

Propylamine (so called).—This, the last subject upon which I will offer any remarks, has given rise to some discussion and to much confusion in the medical journals, but it may be disposed of in a few words. The principal points which I would urge are the importance of precise nomenclature, especially in organic chemistry, and the necessity of discriminating clearly between isomeric compounds, or, in other words, not to mistake identity of *composition* for similarity of *constitution*. So far back as 1817 it was announced that the fœtid odour of *Chenopodium vulvaria*, a British plant, commonly known as stinking goose-foot, was due to the presence of a volatile ammoniacal compound ready formed—the first example of a free alkali in the vegetable kingdom. More than thirty years subsequently (1851) it was shown that the same volatile base existed in many other plants, and in various animals (May bug), its most abundant source being herring brine; and it was at first identified with the chemical compound propylamine, *i.e*, propyl-ammonia. For years this was generally accepted, and the drug was introduced into medicine under that name by Dr. Awenarius, of St. Petersburg, in the treatment of rheumatism more especially. Even in the last edition (1865) of Guibert's excellent "History of New Remedies," this substance is treated of under the erroneous title of propylamine. But it has been known for some years (1862) that true propylamine has a different origin, and exhibits widely different properties, and it has been proved that the so-called propylamine of commerce, obtained from cod-liver oil, herring brine, ergot, &c., is in reality trimethylamine, with which it is isomeric.

The ultimate composition of these bodies is $C_3 H_9 N$, but, of course, this formula in itself teaches us little, and we now know that there are at least three different bodies which own this empirical formula, and yet are totally distinct from each other. These bodies are:—

$$\left.\begin{matrix} C_3 H_7 \\ H \\ H \end{matrix}\right\} N$$—A primary amine=true propylamine.*

* There is also iso-propylamine known,

$$\left.\begin{matrix} CH\ (CH_3)_2 \\ H_2 \end{matrix}\right\} N,$$

$$\left.\begin{matrix} CH_{3'} \\ C_2\,H_{5'} \\ H \end{matrix}\right\} N\text{—A secondary amine=methyl-ethyl-amine, and}$$

$$\left.\begin{matrix} CH_{3'} \\ CH_{3'} \\ CH_{3'} \end{matrix}\right\} N\text{—A tertiary amine=trimethlylamine.}$$

We should remember, then, that as yet there is no such thing as real propylamine used in medicine, and what is styled so is undoubtedly trimethylamine.

The boiling point alone will distinguish trimethylamine from propylamine, for the former boils at 40° F., and the latter at 121°. The dose of trimethylamine is 20 m. and upwards. It may be said, what is the use of this dissection of formulæ, this contention about names—let chemists fight their own battles. To this I would answer, not only is the confusion of names mischievious, but the properties of these bodies are different one from another, and plainly all accurate knowledge is at an end unless names be used in their true signification. It is only because of their comparative novelty, and of the partial resemblance between propylamine and trimethylamine, that these two liquids have been confounded. Morphia and piperia are isomeric—their empirical formulæ are identical—yet no one dreams of confusing these two bases, for they are too widely apart in their origin and properties. In reference to the class of bodies to which trimethylamine belongs, viz., the amines (*i.e.*, organic ammonias), it may be observed that, as all the natural alkaloids are probably either secondary or tertiary amines, it is only rational that we should look for active agents among such as can be artificially prepared.

If we now take a glance over the history of *organic* chemistry, *i.e.*, the chemistry of the hydrocarbons and their derivatives, from its birth, half a century back, we shall see that the principal services rendered by chemistry to therapeutics distribute themselves through several epochs. First, chemical analysis came to our aid, and revealed the existence of distinct active principles in drugs, and explained their composition. To this study we owe the whole group of alkaloids, and the knowledge of such facts, for example, that the properties of cherry laurel water, or of emulsion of bitter almonds, are entirely due to the production of prussic acid. The poisonous qualities of bitter almonds had been indicated from antiquity, and those of cherry laurel from the beginning of the eighteenth century.

Then, advancing beyond the mere separation of immediate principles, chemists submitted animal and vegetable matters to the action of the most varied and powerful re-agents, and thus, through the study of chemical metamorphoses, whole groups of new compounds were opened up, and novel, simple, and less costly processes for the preparation of bodies previously known were disclosed. In proof of this may be cited the present commercial manufacture of

benzoic acid from hippuric acid, and of glycerine by the aqueous saponification of fats.

In pursuing these intricate studies chemists were naturally led, not only to the consideration of known substances in varied aspects, but also to the discovery of entirely new compounds.

How pregnant with value this line of research has been to medicine will be manifest when I mention among its offspring creosote, carbolic acid, collodion, chloroform, chloral, apomorphia, &c.; while in the arts we have from coal, benzine, aniline, with its splendid colour-derivatives, and anthracene, from which the colouring principle of madder is artificially obtained. In the more recent times still, physiologists and therapeutists, not content with passively accepting information from scientific chemists, assume, in their turn, the position of teachers, and by the happy combination of their joint labours we may justly look forward to the array of discoveries, of which nitrite of amyl, chloral, and chloroform are the heralds.

In conclusion, I wish to say that my object in demonstrating these various drugs this evening was mainly on account of their possible novelty to some of the members, and to give them an opportunity of examining them at leisure. Some of the remedies were referred to chiefly from a chemical point of view, but I would not be understood as desirous of claiming too arrogant a position for chemistry in its relation to therapeutics, nor can therapeutics ever be built upon any one science, or be successfully studied without the co-operation of clinical observation.

But while I do not believe in the visions of those who see in the chemistry, and in the chemistry alone, of the future, a complete and harmonious system of therapeutics, the close and legitimate aliance which subsists between scientific chemistry and practical therapeutics cannot be too strongly upheld.

SUGGESTIONS TO BEGINNERS IN PHARMACY.

BY PROFESSOR WILLIAM PROCTOR, JR.

(Continued from page 385.)

In an establishment where the preparations of the Pharmacopœia are made for its own dispensary, the beginner has a great advantage, as from the first he can witness processes more or less interesting, and which arrest his attention. Though at first only as an aid, or perhaps coming in at the close to cleanse the apparatus, he soon learns enough to be useful, and then if he is willing and obliging, he has the *open sesame* of rapid advancement. In this way a three months' apprentice, has taken charge of the weekly

supply of citrate of magnesia in a careful and reliable manner, and has felt encouraged and sustained by his consciousness of being useful, and of advancing in knowledge. When he becomes conscious of a desire to enter the field of book knowledge, and make it assist his observing faculties, and explain his difficulties, a great point has been gained in his onward progress. Let us suppose his first trouble in washing mortars to arise from Prussian blue, which resisting his best efforts he applies for help, and is told to use solution of potassa, the magical effect of which makes a deep impression on his mind. When evening comes he sets to work with the Dispensatory, at the article Prussian blue, and soon gets at sea in chemistry, which he cannot understand, but he succeeds in learning that potash forms a soluble salt with Prussian blue, and thus detaches it from the porcelain surface, setting oxide of iron free. At the same time he glances at "*Potash*," learns its origin from wood-ashes lye, that it is a *base*, neutralizes *acids*, forms *salts*, dissolves *fats* and forms *soap*, and many other facts.

Now it is not to be expected that our young friend has gotten a very clear insight into the chemistry of these subjects, but if intelligent he has seized the leading points, and will not rest until all is understood by subsequent study. The habit of close observation of color, taste, odor, shape of outline, and configuration of parts, should be cultivated as one of the most valuable aids in gaining knowledge, as he progresses from day to day, and by cultivating a habit of using the pencil to imitate the form and construction of objects, whether drugs or apparatus, it will be found to aid the memory decidedly.

We will suppose our lad is set at grinding senna in a Swift's mill, for fluid extract. It is light work but tedious, and in the frequent resting-spells his curiosity is attracted to the drug. He finds several distinctly shaped leaves, notices that at the base they are mostly *uneven*, but some are not, that when chewed the drug colors the saliva quickly, and that it has a peculiar odor. If he is critical he may find leaf-stalks, seed-vessels, &c., and by the time he has ground ten pounds he is pretty well acquainted with the sensible characteristics of senna. When evening arrives he resorts to his Dispensatory and finds that there are several kinds of senna, and it takes him some time to decide that the mixed character of what he had been grinding fixed it as the Alexandrian, or Upper Nile senna. He notes the kind of plant, gets a hint of its commercial history, what it contains, what liquids are best to extract its virtues, what medical properties it has, and what preparations are made from it. He then re-examines the leaves in view of his reading, looks at his school atlas for Nubia and Abyssinia as the country of its growth, and the next time he is sent to a large drug store asks to see a *bale* of senna, and he is pretty well booked up on senna, and will not forget it; all this will take several evenings. Senna is but one of a long list of

vegetable drugs that in his first year's experience will practically come to his acquaintance, and by following the same course, an outline of whose history will be grasped, and gathered into his storehouse of memory for future use.

At the very beginning of the Pharmacopœia is a notice of the weights and measures used in pharmacy, and at the end of the Dispensatory a much longer notice describing the French and other weight and measures. Now as pharmacy is a business constantly requiring exact quantities by weight and measure, the beginner should from the first familiarize his mind with the officinal weights and measures, and the manner of using the scales or balance, and the measures of capacity, as well as the relations of troy weight to avoirdupois or English weight, and metrical or French weight. He should also try his hand at dividing a given quantity, say a drachm, into ten parts with a spatula, by the eye, and then weigh each one, and see how it varies from six grains, the proper weight of a tenth. For the same reason that he exercises his memory to grasp knowledge, he should exercise his senses and muscles to acquire skill, constantly keeping in mind the old adage "that whatever is worth doing should be done well." In the simple matter of wrapping packages in paper there is a wide field for skill. Some never learn how to do it neatly, especially doses of powders. Others give so neat and regular a finish to their work as to make it attract attention. The wrapping of bottles and boxes in paper, and especially the tying of bundles, all are worthy of close attention until habitual skill is attained.

In the matter of cutting, and attaching labels to bottles and boxes, the same range of skill exists, and to be always neat requires care in gaining the habit at first.

In the manner of handling the pestle in trituration, in contusion, pill-making, or in emulsionizing, or of managing the spatula in mixing ointments or powders, there is a wide margin for grades of skill and neatness.

Cleanliness in pharmacy is a virtue that ranks with *order*, and without these the shop practice becomes more or less demoralized. Clean glassware, bottle, graduated measures, white mortars, bright spatulas, and a clean, orderly counter, add wonderfully to the pleasure of dispensing, as they do favorably impress the patrons of a store. The habit of restoring bottles to their proper places after using them, that of keeping all receptacles suitably filled ready for use, and that of labelling every vessel or package that is set aside, are among the most useful that contribute to shop order and comfort. The amount of trouble and annoyance saved by habitual attention to these shop morals, by *all* employes, can only be appreciated by those who have seen the working of both plans, and drawn their conclusions.

It is to ingraft and fix these and other important habits, that

our colleges require four years' apprenticeship or training at the dispensing counter and in the laboratory, before granting their diploma; a requirement which should be most strictly carried out.

But a new experience awaits our novice; he is to take part in a chemical operation attended with some care and labor,—the making of Vallet's pill-mass of carbonate of iron. After weighing certain quantities of sulphate of iron and carbonate of soda, he separately dissolves them in boiling water containing a portion of syrup, strains the solutions to remove undissolved particles, and mixes them, when cold, in a vessel just capable of holding them, when, to his surprise, a thick, pulpy, bluish-white mixture results, which separates into a solid precipitate and a clear liquid above. The liquid is drawn off, and its place filled with pure boiled water containing syrup, and the whole intimately mixed, allowed to settle, and the process repeated, and the sediment finally drained on a cloth filter, tied, expressed, mixed with sugar and honey, and on a water-bath evaporated with constant stirring, until when cool it has a solid pillular consistence. The points in this process to attract his attention are: the reason that mixing the clear solutions produces a sediment, why boiled water is used, why the washing water is sweetened, why honey is used, and, finally, why a water-bath is employed. After the tedious process of stirring is concluded, and the pill-mass stowed away yet warm in jars, the Dispensatory will answer all these queries clearly and satisfactorily, if appealed to, and he will have added a chemical chapter to his experience, involving the law of double decomposition, and the power of sugar to prevent or retard atmospheric oxidation, and the process of decantation and filtration.

This is only one of many chemical processes that he will be called on to take part in, long before he will be able to attend lectures at college; or, if this is beyond his reach, before he can make progress in the study of chemistry sufficiently to understand chemical reactions. It is this excited curiosity, this desire to understand phenomena daily occurring, that is to stimulate his efforts at self-improvement in knowledge, and finally give him the victory over adverse circumstances. Some of the greatest minds devoted to chemistry in the past have thus begun their career. Scheele, the discoverer of so many organic bodies, Davy and Liebig, so justly celebrated as chemists and investigators, were all at one time apothecary boys, groping in the dark bravely, until they found light for themselves and all others. But our beginner is getting sufficiently advanced to be called a student, he is in his second year, and looking forward to attending lectures next winter, when he will enter systematically on the science of his business, and clear up hundreds of little theoretical difficulties that have bothered him in his progress. He begins to see that botany is necessay to understand materia medica, and that the laws of physics or natural philosophy

have much to do with explaining the phenomena of steam apparatus, of solutions, of crystallizations, and of taking specific gravities; and he rightly desires the aid of hand-books. For the former, Dr. Gray's little work, "How Plants Grow," will serve his purpose; or "Lindley's Outlines of Structural Botany;" and for physics, some work like "Ganot's Popular Physics," will do for awhile; but Mueller's will be more satisfactory for advanced students. Special works on manipulation, chemical and pharmaceutical, are of great value. The great book of Faraday on Chemical Manipulation, so simple in its language, but so full in its meaning, has long been out of print; but "Campbell-Morfit's Chemical and Pharmaceutical Manipulations," is a good substitute and well illustrated. Bowman's Chemistry for the Beginner in analysis, is good; but for the more advanced student, Dr. Attfield's Chemistry, written with a view to the needs of the student of pharmacy is excellent. In fact, the literary aids to the student are so numerous that he is often confused in choosing a guide, and it is of the utmost importance that he should keep his mind clear to his main object, the building up layer on layer, regularly and solidly, the superstructure of his own professional knowledge, on the solid foundations he has laid by his first and second year's devotion to the rudimentary services in the laboratory and at the counter. If successful, his reasoning powers will have been exercised freely, his judgment matured, his memory well stored with facts, derived from study or from observation and experience, and he will be well fitted to receive the honors of graduation, and to go out into the world as a disciple of Esculapius in the service of his fellow-men.

NOTE ON POWDERING CAMPHOR.*

BY GEORGE F. EBERT.

The methods and suggestions for powdering camphor, and retaining this refractory body in its powdered state, have not alone been numerous but curious. Among the processes offered I will cite that of resubliming by aid of heat. This was suggested in a paper read at the 19th annual meeting of the A. P. A. at St. Louis, 1871. Had the author of this paper given the volatility of camphor its due consideration he never would have claimed any advantage in obtaining the camphor in a very *dry* powdered state, as this certainly is the most favorable condition for its recrystalization.

Somewhat later the subject fell under the scrutiny of the "Pharmacal Writer of the Period," who after a critical review of the dif-

* Prom the Pharmacist

frent suggestions of his confreres, "capped the climax" by suggesting the sticky agency of that nasty and horrid of all substances, *castor oil*. Having still a faint recollection of our *castor-oiling* in infancy, when the "tempter," having failed to corrupt our infantile integrity with bribes of sugar-plums, etc., our hands were firmly held, the nose ruthlessly seized and pinched, and without further hesitation the sticky oil was poured down our throat. Although this forcible coercion had left a deep-rooted grudge against castor oil, we gave the suggested process a fair trial, and proved it, like many other processes suggested by this prolific writer, very nice in theory, but very poor in practice, the camphor acquiring an oily, rancid odor, and not accomplishing the desired object in retaining it in the powdered state. The problem being still unsolved, I gave the subject further thought and experimentation, and after many trials with numerous agents, I find the much used and much abused *Glycerin* the simplest and most efficient substance to keep camphor in a fine divided state. The following is the maximum quantity of glycerin which I have found necessary to overcome the adhesiveness of the particles of camphor for each other.

Take of Camphor	6 ounces.
Alcohol	5 fluidrachms.
Glycerin	1 fluidrachm.

Mix the glycerin with the alcohol and titurate it with the camphor until reduced to a fine powder.

PREPARATION OF TAR WATER.—The Phila. *Medical and Surgical Reporter* abstracts from a French journal the following method for the preparation of tar water:—Mix 300 parts of Norwegian tar, 250 of bicarbonate of soda, and 500 of rain water. Allow the mixture to react in the cold for two hours, then gently boil it for a quarter of an hour, stirring continually. Remove from the fire, and add of boiling rain water 9,500 parts. Agitate briskly for a few minutes, then let the mixture cool. After cooling, let it be well shaken on several occasions. Finally, let it clear itself, by deposition, of any undissolved tar. The first boiling produces a sort of tar-soap, in the form of a soft, clear-yellow, and homogeneous mass. To a great extent this soap becomes perfectly dissolved in the water, and imparts to it a brown color. It is important that the boiling should not be long continued, lest it snould decompose the tar, and it is further desirable that the mixture should be allowed three or four days, or even longer, to clear itself, as it thereby acquires more aromatic properties.

Editorial.

THE ADULTERATION ACT.

At the close of last session of the Dominion Legislature, an "Act to impose license duties on Compounders of Spirits; to amend the Act respecting Inland Revenue; and to prevent the Adulteration of Food, Drinks and Drugs," was passed, and on the 1st of January of next year will be carried into effect. This measure bears abundant evidence of the haste which characterized its passage through Parliament, but still contains many good features, which, when perfected into a practicable and smoothly-working shape, will have a generally beneficial influence on the community.

It is no part of our duty to discuss the expediency of increasing the revenue by imposing upon compounders of spirits a license fee amounting to fifty dollars per annum; suffice it to say that such license is required, and that it was only at the final reading of the Bill that this decision was arrived at; the original intention being that of imposing a heavy excise duty on articles manufactured, as well as requiring the payment of the above fee. The former portion of the clause was very properly withdrawn, for it would have been manifestly unjust to exact fresh duties on spirits which had already contributed their full share to the revenue, and which, in many cases, would merely have changed their form by being diluted with water.

The first thirteen sections of the Act relate exclusively to "compounders" of spirits, and it may be well for us to inquire whether, in any wise, druggists fall under this denomination. A *compounder* is defined "to mean and include any person, who, by himself or his agent, compounds or mixes for sale, by wholesale, any of the articles enumerated in the first schedule to the Act, or which may be added to such schedule by order of the Governor in Council. *Compounded spirits* are held to include all articles containing Canadian or other spirits, and which are enumerated in the first schedule, or which may be added thereto. This schedule includes the following liquids: "Imitations of British or foreign wines, brandy, rum, gin, old tom, Geneva schnapps, British or foreign whiskey, and *bitter liqueurs and cordials containing alcohol.*"

It is evident that if a druggist holds strictly to his own legitimate business he cannot certainly be called a compounder, but we know that there are some who undoubtedly belong to the category. The articles which we have marked in italic embrace a few compounds of the character of which there can be no doubt, and some which are not so clearly placed. This matter will no doubt come up before the Act comes into force, and we shall then be in a better position to discuss it.

The remaining sections of the Act relate to certain amendments to the revenue laws at present in force; and to the adulteration of food, drink, and drugs. These terms are separately defined, and we are told that "*food* means and includes every article used as food in the state in which it is offered for sale, or that is used in the preparation of food by admixture therewith, either before, during, or after cooking. *Drink* means and includes any liquid used as a beverage, and any article used in or for the preparation or partial preparation of any beverage. *Drug* means and includes all articles used for curative or medicinal purposes." These definitions are sufficiently full and explicit and will much facilitate the working of the Act.

As to what constitutes an adulteration we learn that it is held to be the admixture of any deleterious ingredient, or any material or or ingredient of less value than is understood or implied by the name under which the article is offered for sale. The adulteration of drink is especially mentioned, and in a schedule appended to the Act certain deleterious articles are enumerated. These embrace cocculus indicus, common salt, copperas, opium, Indian hemp, strychnine, darnel, sud, extract of logwood, salts of zinc, lead, or alum, and any extract of compound of any of these. Any person who shall expose or offer for sale, or sell, any article of drink containing any of the above ingredients, knowing such to be the case; or who shall be guilty of such admixture; and any compounder who has upon his premises any of the above articles, for the possession of which he is not satisfactorily able to account, shall, for the first offence, be liable to a penalty of one hundred dollars, and, for the second offence, two hundred dollars. How this portion of the Act can be practically carried out, and what the effect of prohibiting the use of the above articles will amount to we shall reserve for further discussion.

The adulteration of food and drugs is attended with similar

penalties, and the detection of such adulteration is provided for by the appointment of analysts. Officers and inspectors of inland revenue, or officers specially created under the Act, are to act as inspectors, and may at any time enter the premises of persons keeping food, drink, or drugs for sale, and demand samples of such commodities. These must be furnished, but the person furnishing such samples may have the privilege of retaining, under seal, a portion of such samples. This will afford means to verify results of analysis or settle disputes regarding any disagreement arising from this cause. Persons from whom samples have been obtained have also the privilege of attending when the sample taken by the inspector is opened by the analyst, and there are also other conditions and restrictions to ensure the just working of the system. In case the analyst detects adulteration the fine above stated may be imposed, together with the costs of analysis.

A useful feature, which will be the means of collecting much valuable information relating to adulteration, is that requiring analysts to make a quarterly report, to the Department of Inland Revenue, of all analyses made during the period, and of the nature and kind of all adulteration detected. This report will be printed and appended to the annual report of the Department.

Editorial Summary.

Preparation of Lunar Caustic.—Mr. E. Bouilhon, (*Repert. de Pharm.* in *Phar. Jour. and Trans.*,) alludes to the imperfections of caustic crayons, their varying color, composition and brittleness. Some manufacturers add nitrate of potassium, as well for the purpose of reducing cost as of producing a whiter caustic. In other cases, chloride of silver is present, either as an accidental impurity, or added for the sake of improving the color and toughness. Such crayons are quickly darkened by light. Again, a basic nitrate, or nitrite of silver, originating in the overheating of the fused salt, is often present. Strangely enough, the Codex, losing sight of the fact that the nitrate is easily reduced by organic matter, especially under the influence of heat, recommends the greasing of the moulds, and also directs the salt to be kept for some time in a state of fusion. The author rightly concludes that none of these expedients need be

adopted in order to produce a presentable and reliable article; and that the unchanged nitrate yields the best caustic when pure and unadulterated. In order to produce crayons of this character, he recommends a process for producing the nitrate direct from the metal; but in this there is nothing new or worthy of remark. The only improvement on other published methods relates to the operation of fusion. It is recommended that when about three-fourths of the nitrate is melted the heat should be withdrawn, or rather the liquid portion should be run into the moulds, which should be perfectly clean, and, preferably, of copper. In this way crayons are produced of a dead-white color and of irreproachable solidity.

Mixture for Tapeworm.—A writer in the *Druggists' Circuluar* recommends, for the expulsion of tapeworm, the following mixture:

Bark of pomegranate root, ½ ounce,
Pumpkin-seed, 1 ounce,
Ethereal extract of male fern, 1 drachm,
Powdered egrot, ½ drachm,
Powdered gum arabic, 2 drachms,
Croton oil, 2 drops.

The pomegranate-bark and pumpkin-seed are thoroughly bruised, and, with the egrot, boiled in eight ounces of water for fifteen minutes, then strained through a coarse cloth. The croton oil is first well rubbed up with the acacia and extract of male fern, and then formed into an emulsion with the decoction. The worm will generally be expelled alive and entire within two or three hours after the exhibition of the dose. As far as preliminary provisions are concerned it will be found advantageous for the patient to abstain from breakfast on the morning the mixture is taken, and also to take a full dose of sal Rochelle the preceding evening.

Chloral in Headache.—A writer in the *Atlanta Medical and Surgical Journal* recommends the local application of chloral as a remedy in ordinary nervous headache. Fifteen or twenty grains of chloral are dissolved in a very small quantity of water. The solution is applied to the seat of pain, by the tip of the finger, and gentle rubbing of the skin is resorted to until redness of the skin is apparent. The application need not extend over a greater surface than that which might be covered by a silver dollar. Slight desquamation of the epidermis usually results.

Proportion of Alcohol in various commercial Bitters.—The State Assayer of Rhode Island has been making an examination of the so-called bitters found in the American market, and of

thirty-four samples, finds the amount of alcohol to run from 6.36 to 43.20 per cent. The following list contains an enumeration of those bitters which are best known in Canada:

	PER CENT.
Hostetter's Stomach Bitters	43.20
Drake's Plantation Bitters	30.24
Rush's Bitters	34 30
Peruvian Bitters	22.40
Hoffland's German Bitters	20.85
Oxygenated Bitters	19.23
California Wine Bitters	18.20
Walker's Vinegar Bitters	7 50

Composition of the white coating of Bleached Ginger.—Mr. T. Garside, (*Pharm. Jour. and Trans.*) having examined five samples of bleached ginger, concludes that the commonly received opinion of such ginger being bleached by chlorine or the fumes of sulphur is incorrect. The white appearance on two of the specimens examined was produced by a coating of plaster of paris; on the remaining three, by a powder consisting of calcium carbonate, 87.12; calcium sulphate, 7.90, and calcium chloride, 4.98 per cent.; about the composition of ordinary whitewash. This earthy matter amounted to 2.33 per cent. of the weight ofthe ginger; an adulteration worthy of serious consideration.

Practical Formulæ

French Putty.—Discovered by Reuben, of Paris, is prepared as follows: 7 ℔ of linseed oil are boiled for about two hours with 4 ℔ of brown umber, after which 2 oz of finely cut wax are added; the mixture is removed from the fire, and 5½ ℔ prepared chalk and 11 ℔ of white lead are well incorporated. This putty is said to be very durable, and can be used on frames without oiling them previously. *American Journal of Pharmacy.*

How to Deodorize Cocoa-nut Oil.—The following has been recommended:—To one pound of the oil add one ounce of freshly-calcined bone-black and half an ounce of calcined magnesia. Let it stand in a warm place, with frequent agitation, during three days. Allow it to settle down or filter through paper in a funnel provided with a double jacket holding warm water. During the maceration with bone-black, the oil must be kept just warm enough to remain in the liquid state.—*Druggists' Circular.*

Varieties.

PETROLEUM FOR BURNING BRICK.—A burner is in use, in Canada, by which residuum or crude petroleum is used instead of coal or wood in brick kilns. By a simple contrivance the nozzle of the burner is made to throw the flame directly downward at the first firing, and after burning the head (as it is termed) this nozzle is replaced by a straight one, the change being effected in a few moments. The flame is thereby thrown into the arch any required distance, burning the whole kiln from one end, and doing it in much less time than by the old method, and with perfect success as regards the quality of the burning. One man, by this process, will be able to do as much firing as a dozen with the old, as he can attend to as many arches as may be set going in one yard, and by this means save a large item in labour. The tar or petroleum consumed will not cost as much as wood at $3.50 per cord.—*Jour. of App. Chem.*

TANNIC ACID FROM SUMAC.—Whatever doubts may have existed as to the identity of the tannic acid in Sicilian sumac and that in gall nuts have been removed by the experiments of Julius Lowe. His experiments prove that tannin can be profitably prepared from the Sicilian sumac, which contains as much, if not more, of this material than gall nuts. To ascertain how much of the tanning substance is contained in sumac, which is now so much used for that purpose, the usual method of titration is employed. The tannin is extracted from the sumac by means of water, the solution filtered through flannel, and the tannin taken up with acetic ether. From this solution the ether may be distilled off and employed a number of times for the same purpose, so that the cost is not increased by the use of this solvent. Acetic ether is easier to use, and less dangerous than the more volatile and inflammable ether ordinarily employed.—*Jour. of App. Chem.*

A NEW USE FOR NITRIC OXIDE.—The most important use to which nitric oxide is now applied is the oxidation of sulphurous acid and its conversion into sulphuric acid. The ease with which it takes up oxygen from the air and gives it up again to other substances is likely to find other important uses in the arts. Kuhlmann has employed it quite successfully for converting the protoxide of manganese, formed by precipitating the chlorine residues with lime, into the binoxide, and thus rendering it capable of use for an indefinite number of times in the manufacture of chlorine. If nitric oxide mixed with a sufficient quantity of air be passed over the protoxide of manganese, the latter is converted into the nitrate of manganese. On heating the nitrate of manganese to 200° C. it is entirely decomposed, giving off nitric oxide, while binoxide of manganese remains behind.

$$Mn\,NO_3 = Mn\,O_2 + NO.$$

The nitric oxide involved in this part of the process is mixed with air, and employed to convert a fresh quantity of the protoxide into the nitrate, which is again decomposed by a temperature of 200°, so that the process is continuous, and theoretically unending. Kuhlmann is now engaged in overcoming some practical difficulties in the way of applying it on a large scale.—*Jour. of App. Chem.*

DRUGS, MEDICINES, &c.	$ c.		$ c.
Acid, Acetic, fort	0 15	@	0 16
Benzoic, pure	0 22		0 27
Citric	1 40		1 50
Muriatic	0 05		0 06
Nitric	0 11½		0 15
Oxalic	0 23		0 24
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	1 91		2 05
Arrowroot, Jamaica	0 18		0 22
Bermuda	0 50		0 65
Alum	0 02¾		0 03½
Balsam, Canada	0 50		0 50
Copaiba	0 95		1 00
Peru	3 75		4 00
Tolu	1 15		1 20
Bark, Bayberry, pulv	0 20		0 22
Canella	0 17		0 20
Peruvian, yel. pulv	0 42		0 50
" red "	2 10		2 20
Slippery Elm, g. b	0 15		0 20
" flour, packets	0 28		0 32
Sassafras	0 15		0 18
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 40
Refined	0 45		0 50
Cantharides	2 40		2 50
Powdered	2 60		2 70
Charcoal, Animal	0 04		0 06
Wood, powdered	0 10		0 15
Chiretta	0 23		0 30
Chloroform	1 00		1 65
Cochineal, S. G	0 75		0 90
Black	1 10		1 20
Colocynth, pulv	0 60		0 65
Collodion	0 70		0 80
Elaterium.....oz	3 20		4 00
Ergot	0 32		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 50		1 60
Jalap	5 00		5 50
Mandrake	1 75		2 00
Nux Vomic.....oz	0 40		0 50
Opium.....oz	1 50		
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 40		0 42
British or Dextrine	0 13		0 15
Benzoin	0 35		0 75
Catechu	0 12		0 15
" powdered	0 25		0 30
Euphorb, pulv	0 35		0 40
Gamboge	1 40		1 50
Guaiacum	0 50		1 00
Myrrh	0 50		0 85

DRUGS, MEDICINES, &c.—*Contd.*	$ c.		$ c.
Sang Dracon	0 60		0 70
Scammony, powdered	6 00		6 50
" Virg. "	14 50		—
Shellac, Orange	0 80		0 85
Gum, Shellac, liver	0 70		0 75
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 25		0 30
Vienna	0 29		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 55		0 58
" & Strychine	0 20		0 25
Sulphate, pure	0 08		0 10
Iodine, good	6 25		7 50
Resublimed	7 25		7 50
Jalapin	1 25		1 50
Kreosote	2 40		2 50
Leaves, Buchu	0 22		0 32
Foxglove	0 25		0 30
Henbane	0 35		0 40
Senna, Alex	0 27		0 60
" E. I	0 14		0 20
" Tinnevilly	0 20		0 30
Uva Ursi	0 15		0 17
Lime, Carbolate.....brl	5 50		—
Chloride	0 05		0 06
Sulphate	0 08		0 12
Lead, Acetate	0 15		0 16½
Leptandrin.....oz.	0 60		—
Liq. Bismuth	0 50		0 75
Lye, Concentrated	1 75		2 00
Liquorice, Solazzi	0 50		0 55
Cassano	0 23		0 40
Other brands	0 14		0 25
Liquorice, Refined	0 35		0 45
Magnesia, Carb..... 1 oz.	0 20		0 25
" ..... 4 oz.	0 17		0 20
Calcined	0 65		0 75
Citrate.....gran.	0 63		0 75
Mercury	1 85		1 90
Bichlor	1 70		1 75
Chloride	2 00		2 10
C. Chalk	0 75		80
Nit. Oxyd	2 10		2 15
Morphia Acet	5 60		5 65
Mur.	5 60		5 65
Sulph	5 70		5 75
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 25		7 50
Caraway	3 20		3 50
Cassia	2 25		2 50
Castor, E. I	0 16		0 18
Crystal	0 22		0 25
Italian	0 26		0 28
Citronella	1 15		1 25
Cloves, Ang	3 00		3 00
Cod Liver	1 05		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 40		1 60
Lemon, super	4 50		4 75
ord	3 20		3 40
Orange	3 00		3 25
Origanum	0 65		0 75
Peppermint Ang	15 00		16 00
" Amer	5 00		5 50
Rose, Virgin	8 50		8 75
" good	6 80		7 00
Sassafras	0 75		1 90
Wintergreen	6 00		6 50
Wormwood, pure	4 00		6 00
Ointment, blue	1 30		1 50
Opium, Turkey	10 50		11 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 30	1 40
Potash, Bi.chrom	18	0 20
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 45	0 50
Nitrate	9 00	10 00
Potassium, Bromide	1 00	1 10
Cyanide	0 60	0 5
Iodide	5 75	6 25
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	0 95	1 00
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 50	—
" 100 oz. case.	2 55	—
" 25 oz. tin..	2 53	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 08	0 10
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	1 50	1 60
Jalap, Vera Cruz	90	1 15
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 50	2 75
" E. I	1 10	1 20
" " pulv	1 20	1 30
" " 2nd	0 90	1 00
" French	0 75	—
Sarsap., Hond	0 50	0 52
" 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 32	0 35
Soda	0 02½	0 03
Seed Anise	0 13	0 16
Canary	0 05	0 06
Cardamon	2 25	2 50
Fe ugreek, g'd	0 09	0 10
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 03⅜	0 05
Bicarb. Newcastle	6 20	6 50
" Howard's	0 14	0 16
Caustic	0 05½	0 05¾
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 25	2 50
Sulphur. Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 75	0 80
Zinc. Chloride.....oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
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 02¼	0 04
Indigo, Bengal	2 40	2 50
Madras	0 90	0 95
Extract	0 30	0 35

DYESTUFFS—*Continued.*		
Japonica	0 07⅜	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 02½	0 03
Logwood, Camp	0 02¼	0 3½
Extract	0 10	0 14
" 1 lb. bxs	0 13	—
" ½ lb. "	0 14	—
Madder, best Dutch	0 12	0 14
2nd quality	0 11	0 13
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 35	0 38
Cloves	0 46	0 48
Cayenne	0 28	0 30
Ginger, E. I	0 19	0 20
Jam	0 20	0 30
Mace	1 65	1 75
Mustard, com	0 20	0 25
Nutmegs	1 15	1 20
Pepper, Black	0 22½	0 23
White	0 35	0 36
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07½	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 07	0 08
Umber	0 07	0 10
Vermillion, English	1 85	1 90
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen	0 08⅛	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 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 03⅜	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 50	—
" No. 1	2 25	—
" No, 2	2 00	—
" No. 3	1 75	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	4 25 @	4 50
Rosin, Strained	4 50	—
Clear, pale	5 75	7 25
Spirits Turpentine	0 57	0 60
Tar Wood	4 25	4 50
OILS.		
Cod	0 63 @	0 70
Lard, extra	0 90	0 95
No. 1	0 85	0 87
No. 2	0 80	0 85
Linseed, Raw	0 72½	0 75
Boiled	0 77½	0 80
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 72	0 75
Straw	0 68	0 70
Sesame Salad	1 30	1 35
Sperm, genuine	2 35	2 40
Whale refined	70 0	0 75