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Original and Selected Papers.

TINCTURES.*

BY R. ROTHER.

Many officinal tinctures are too weak in alcohol. Firstly, as most tinctures are comparatively feeble preparations, when referred to their strength determined by the relative proportion of the solvent, the active constituents being highly attenuated and exposed, hence a deficiency of alcohol very materially impairs the permanence; secondly, an unsatisfactory menstruum either fails to exhaust the activity from lack of solvent power or by reason of mechanical obstructions inherent to a particular drug fails to permeate its natural structure completely; thirdly, the manner in which some officinal processes are conducted often vitiates the result; fourthly, compound tinctures are usually too complex, similar agents are thereby only multiplied, the aromatics are complicated and often actually superfluous, and artificial coloring matters worse than useless.

Therefore, by the first reason above given, in cases of remedies administered as tinctures in measurably large bulk, it would be advisable to secure a greater degree of concentration.

For the second reasons as above stated, it becomes almost indispensable to increase the alcoholic strength of many menstrua.

For the third reason preceding, where the officinal operation is in itself objectionable it is of the utmost importance that the process should be reconstructed.

For the last reason above set forth, it is the writer's opinion that

*From the Pharmacist, Jan., 1872.

the active ingredients in any compound tincture should be limited to three; that the aromatic, if there be any required, should either be one simple aromatic or composed of a mixture not exceeding two simple aromatics, according to the number or nature of the active ingredients entering into the composition; and further, as a general rule, artificial coloring matters should be emphatically rejected and only in such preparations where an artificial color might be necessary for purposes of distinction, caramel may, in its various degrees of dilution, alone be admitted, in consideration of its indifferent character chemically and therapeutically, its permanence and intense coloring power.

Much confusion might be obviated if only one strength of alcohol were officinally recognized, namely strong alcohol, and this to be diluted only on the occasion of its use to meet the requirements of each particular case. The diversity in the composition of most crude drugs renders it necessary that more than ordinary reference be had to this fact in the selection of the menstruum. By discontinuing the term officinal alcohol, and the very indefinite designation diluted alcohol as a specific term, the strength of all menstrua could then be more comprehensively expressed by the number of parts of strong alcohol in the composition, as for instance, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, etc., of strong alcohol. To attain a higher degree of stability in numerous tinctures it will become necessary to employ in place of diluted alcohol now used, the mixtures $\frac{1}{2}$, $\frac{2}{3}$, and sometimes even $\frac{3}{4}$ strong alcohol.

Very frequently in the officinal processes the strength of the menstruum and the state of comminution of the substance are badly chosen to meet their mutual relations in favor of the intended result. Sometimes, although not often, the material is presented in too coarse a condition to correspond with the power of the solvent. But much oftener the exact converse is found to exist; occasionally the process of extraction is conducted by percolation when maceration only could be more advantageously applied.

The writer has found that in most percolations a fine powder is preferable to a coarser one; but only when the menstruum is in perfect accord with the nature of the other material. However, a fine powder cannot always be produced. It therefore devolves upon the operator to employ such grades of fineness as the circumstances will afford. In so doing two, and if desirable, three or more grades of powder will be obtained. To treat this properly, so as to utilize the utmost effect of the solvent, the coarser portions must always be packed in the bottom of the percolator in regular succession, the finest at the top; this manner of introduction regulates the passage of the current more effectually than any other method of packing.

With the use of a uniform and fine powder in connection with a menstruum which is liable to cause swelling of the material by reason of alcoholic weakness, the character of the menstruum must

be so adjusted that a comparatively strong alcoholic liquid be used at first to moisten the powder for packing and percolation to partial exhaustion, and subsequently weaker liquids poured on to restore the normal strength of the finished percolate.

Tinctures of resins and gum resins which cannot be prepared by percolation must be prepared by maceration. This process the writer has modified and divided into two peculiarly distinct operations independently applied, as indicated by the nature of the drug.

Firstly, most resinous substances when in a semi-fused condition attach themselves most firmly to the bottom of the bottle from which they can only be loosened and dissolved by persistent and frequent shaking and an immoderate extension of time. The very successful method here introduced consists in placing the resinous ingredients either whole or powdered, in whichever state adaptable, together with the solvent, into a suitable bottle, corking securely and laying the bottle on its side; the semi-liquified resin shortly seeks its level and extends itself over the lower side of the reservoir; now slowly, and by degrees the bottle is revolved, the resinous layer becomes gradually raised in a more perpendicular attitude and thus presents a greater opportunity for the action of the solvent; the heavier portions of the partially charged menstruum continually recede and give scope for the lighter stratum of the liquid above. By this procedure the solution of the resin is effected in hours, where it otherwise requires days or even weeks.

Secondly, gum-resins are occasionally treated by percolation, but usually by maceration; officinal alcohol is invariably the menstruum used. The writer finds that by dividing the given quantity of solvent into its equivalent in strong alcohol and water a sufficiency of the latter can always be secured to emulsify the gum-resin. The strong alcohol is then gradually added to the emulsion; the precipitated gum allowed to subside and the clear, transparent solution of the resin filtered off.

The following officinal tinctures are such to which the writer has applied some of the above suggested modifications, or in which it would be advisable to do so:

Tincture of Aloes and Myrrh.—The writer cannot conceive to what purpose saffron is an incumbent of several officinal compounds. Its medicinal value does not justify it; neither do those properties always harmonize with the object of the combination; moreover, its pecuniary value too far outweighs the therapeutic to be useful. Without offering to cast any serious reflections upon the integrity of the profession, it is safe to say that the instances of its use when officinally prescribed, are in the minority, and generally very little distinction is made between carthamus and crocus. This antiquated relic of an abandoned system should be suppressed.

The tincture is better prepared by emulsifying the three troy ounces of myrrh with the four fluid ounces of water represented by

two pints of officinal alcohol. Then very gradually adding the one and three-fourths pints of strong alcohol with constant stirring. Finally, the aloes and the saffron, and after due maceration, filtering.

Tincture of Arnica.—It is a very poor direction to moisten the arnica and bruise it in a mortar. The writer finds the process vastly superior by grinding the dry flowers in a mill, sifting through a No. 20 or 24 sieve; then moistening with the menstruum, packing firmly into a cylindrical percolator and finishing the process as officinally directed.

Tincture of Assafœtida.—The writer first separates the assafœtida by means of a chisel and mallet into small pieces; then beats up four troy ounces of it in a capacious iron mortar and very gradually adds four fluid ounces of water with constant trituration, and then after perfect emulsification, one and three-fourths pints of strong alcohol, little by little, with continuous stirring, and when the sediment has completely subsided, separating the clear and transparent tincture by decantation or filtration.

Compound Tincture of Benzoin.—In this preparation the tolu ought to be discontinued, as it is perfectly superfluous. The writer prepares this tincture by placing all the prescribed ingredients into a bottle and corking securely. Then, laying the bottle horizontally, and after a sufficient repose gradually revolving it in one direction. The resin rapidly dissolves, whilst the impurities remain as a pulverulent sediment. The tincture is then shaken and filtered.

Tincture of Columbo.—It is nearly impossible to percolate a moderately fine powder of Columbo root with diluted alcohol satisfactorily. The finished tincture is always turbid and cannot be clarified by filtration; eventually much insoluble matter separates. The writer percolates the columbo in moderately fine powder with a mixture of strong alcohol and water corresponding to the mixture of three parts of officinal alcohol and one of water. The root is thereby easily and completely exhausted, and the result is permanently clear and transparent.

Tincture of Cannabis Indica.—The resin is much more rapidly dissolved by the method noticed above.

Tincture of Capsicum.—The mixture composed of three parts of officinal alcohol with one of water is better than diluted alcohol for preparing this tincture.

Tincture of Cardamom.—Three parts of officinal alcohol with one of water exhausts the cardamom much better than diluted alcohol. The tincture is perfectly and permanently clear.

Compound Tincture of Cardamom.—The cochineal and honey should be cast from the formula. This tincture, when added to mixtures containing the slightest acidity has its deep red color instantly discharged. For this reason, if any color is essential, caramel would be in better conformity.

Tincture of Catechu.—Catechu does not readily submit to percolation. It is more easily extracted by the method for effecting the solution of resins.

Tincture of Cinchona.—The mixture composed of three parts of officinal alcohol and one of water is preferable to diluted alcohol.

Compound Tincture of Cinchona.—The red saunders should by all means be omitted. The saffron may, with equal propriety, be left out. The menstruum suggested for tincture of cinchona is equally well adapted here.

Ticture of Cubebs.—Three parts of officinal alcohol with one of water is in this case superior to diluted alcohol.

Tincture of Ferric Chloride.—Where time is not especially an object it is always advisable to derive the ferrous chloride directly from metallic iron. A reduction of the alcoholic strength so that half the volume of the tincture is officinal alcohol would also be a commendable feature. Metallic iron should be employed in the proper proportion for the strength of the tincture, and therefore, be completely dissolved. The amount necessary for four pints of the preparation is 1300 grains or 20.3 grains of metallic iron to the fluid ounce. The 17½ troy ounces of chlorhydric should first be diluted with water to 1½ or 2 pints before its addition to the iron. After this is perfectly dissolved 475 grains of potassium or 412 grains of sodium chlorate is added, and finally the alcohol, with sufficient water to measure four pints.

If the tincture be produced by means of ferric sulphate, and sodium chloride in connection with very little water and much alcohol, the resulting precipitate occasionally carries with it considerable iron in the condition of ferric oxychloride which is insoluble in water or chlorhydric acid. The writer, therefore, now first prepares pure ferrous chloride in alcoholic solution, and adds to this the requisite amount of chlorhydric acid and potassium or sodium chlorate. By this process 6450 grains of ferrous sulphate is heated with 2390 grains of sodium chloride, or better, when it can be conveniently had, 3465 grains of potassium chloride, and 1½ pints of water, slightly acidulated with chlorhydric acid, until the ferrous sulphate has dissolved. After cooling most of the sodium or potassium sulphate will have crystallized, either of them being but sparingly soluble in a concentrated solution of ferrous chloride. The liquid is now pressed out with a muslin strainer and the residue twice treated successively with twelve fluid ounces of strong alcohol and strained. The two alcoholic liquids are then united and slowly poured into the first solution with constant agitation. More strong alcohol is now added, until the whole measures 54 to 56 fluid ounces. After a short repose the liquid is filtered and sufficient strong alcohol added through the filter to make the resulting filtrate measure 58 fluid ounces. 6½ troy ounces of chlorhydric acid is now poured in, mixed and followed by 475 grains of potassium chlorate

in fine powder. A few moments' shaking will suffice to dissolve this. If necessary, strong alcohol is finally added to bring the volume of the tincture to 64 fluid ounces; or the aqueous solution of ferrous chloride containing the sodium or potassium sulphate is poured together, with the latter upon a filter, and when the liquid has drained off the residue on the filter is washed with strong alcohol until the whole filtrate measures 54 fluid ounces. This is well mixed, and after a short interval again filtered. From this the tincture is completed as in the preceding. No iron is lost with the precipitate in this case. All these processes are very simple, and the results exceedingly satisfactory.

Compound Tincture of Gentian.—It is advantageous to moisten the powders with a stronger menstruum than diluted alcohol, as for instance, a mixture of three parts strong alcohol and one of water, percolating partially with this mixture and then with weaker grades so that the final percolate shall have the strength of diluted alcohol.

Tincture of Guaiac.—This is best prepared by the method employed in the solution of resin.

Ammoniated Tincture of Guaiac.—Prepared by the same method of manipulation as the simple tincture.

Tincture of Iodine.—An unnecessarily long time is required to dissolve the Iodine in crystals. However, if the Iodine is first finely pulverized, it dissolves almost instantly. Some difficulty is experienced in pulverizing it, by reason of its volatility and irritating vapors. But if small portions at a time be rapidly pulverized in a good draft no inconvenience will be experienced; or the alcohol can be used separately as strong alcohol and water, the iodine thoroughly triturated with the water and the strong alcohol finally added. This process in a great measure obviates the unpleasant vapor, and is equally expeditious.

Compound Tincture of Iodine.—The iodine and potassium iodide dissolve but very slowly and imperfectly when mixed with the officinal alcohol directly. But if the solvent be divided into its equivalent of strong alcohol and water, which for the officinal quantity of the formula is fourteen fluid ounces of the first and two fluid ounces of latter, enough water is obtained to dissolve the iodine and potassium iodide in a few moments; the solution is then added to the alcohol.

Tincture of Jalap.—If the powder is first moistened and partially percolated with a mixture of three parts strong alcohol and one part water, and then finished with a weaker alcohol, the process will be facilitated.

Tincture of Myrrh.—Three troy ounces of myrrh is first bruised in an iron mortar. Four fluid ounces of water is then very gradually added with constant trituration, so as to form a perfect emulsion. To this twenty to twenty-two fluid ounces of strong alcohol is then very slowly added, with continuous stirring; the precipitate is al-

lowed to subside, again shaken up, the liquid filtered off and sufficient strong alcohol poured into the filter to make the resulting tincture measure two pints.

Tincture of Nux Vomica.—The powder should first be digested with four fluid ounces of water for twenty-four hours; then mixed with sufficient strong alcohol to flow easily, poured into a percolator and further treated with strong alcohol until two pints of tincture is obtained.

Tincture of Opium.—The opium should infallibly be assayed, and the tincture made of such a strength as to contain four grains of morphia in the fluid ounce.

Deodorized Tincture of Opium.—This should by all means be an assayed preparation, having the same morphia strength as the former.

Camphorated Tincture of Opium.—The opium in this tincture should also be assayed and used in such a proportion as to represent six grains of morphia in two pints of the tincture. The menstruum must be equal measures of strong alcohol and water; otherwise the preparation will become turbid in cold weather.

Tincture of Rhubarb.—The powder must first be moistened with a mixture of three parts of strong alcohol and one of water, partially exhausted with this menstruum, and then percolated with weaker alcohol to make the finished preparation of the officinal alcoholic strength.

Tincture of Sanguinaria.—Three measures of officinal alcohol and one of water is better, than diluted alcohol.

Tincture of Stramonium.—The powdered seed must be percolated with a mixture composed of three parts of officinal alcohol and one of water. This yields a perfectly and permanently clear and transparent tincture. The officinal process results in a permanently milky product.

Tincture of Tolu.—The balsam is dissolved by the process for the solution of resins.

CHLORALUM, AND PREPARATIONS OF CHLORALUM AS DISINFECTANTS *

BY PROF. A. FLECK.

The Central Chemical Institution, established last year in Dresden for the protection of the public health, of which Prof. Fleck is the director, received, amongst other things, the disinfectants introduced by the Chloralum Company in London, in order that a thorough investigation of the composition and real value of these products might be made. (Comp. Year, 1870. No. 47, page

*Industrie Zeitung in Chemical Review.

462; and 1871, No. 6, page 56.) The ostentation with which the Chloralum Company commenced, and still carries on its operations, points either to the especial excellence of the disinfectants recommended, or to a great mistake. The suspicion against the Chloralum Company in this last respect was augmented by many external appearances which accompanied the undertaking. Those newspapers and journals of Germany, which enjoy the greatest circulation, have become the debating forum of the Chloralum Company, so that it seems to be high time that an impartial judge, such as the Central Chemical Institution, founded, as it is, under the auspices of the State, to pronounce unreserved judgment on the Chloralum Industry and its products.

The Chloralum Company recommends—1. Chloralum as the safest disinfectant, as free from smell, and not poisonous; and as adapted for the disinfection of urinals and drains, stables, slaughter-houses, street kennels and horse dung, for internal and external use in affections of the throat, diptheria, scarlet fever, small pox, &c.

As Prof. Fleck states in the 2nd, 1871, No. 4, the liquid contents of a clean labelled vessel weighing 637.9, half a litre in volume, and 15 sgr. (1s. 6d.) in price, were used for the chemical investigation. This fluid contains:—

82.32	per cent.	water.
0.15	"	chloride of lead..
0.10	"	chloride of copper.
13.90	"	chloride of aluminium.
0.42	"	chloride of iron.
3.11	"	chloride of calcium with gypsum.
100.00		

2. Chloralum powder is recommended as an absorbent of organic impurities, as an anti-septic and astringent when combined with wheaten flour, and as a disinfectant for railway carriages, ships, privies, stables, drains, &c.

A tin canister, also very handsomely labelled, containing a white powder 370 gr. in weight, and 5 sgr. (6d.) in price was taken to experiment upon. It contained—

0.72	per cent.	chloride of arsenic.
0.55	"	chloride of lead.
0.37	"	chloride of copper.
52.43	"	chloride of aluminium.
1.55	"	chloride of iron.
11.51	"	chloride of calcium.
0.72	"	gypsum.
32.15	"	alumina and silicious earth.
100-00		

3. Chloralum wool and wadding, recommended as a sytptic and anti-septic for fresh or suppurating wounds and cancerous tumours, also as a disinfectant for coffins and corpses. A neatly labelled bag of waterproof material, containing 352 gr. of dried wadding, which had been soaked in 173 g. solid chloralum, or 9.80 g. fluid chloralum, price 20 sgr. (2s.) was taken for experimenting upon.

These analytical results leave no doubt as to the nature and the mode of making the preparations of chloralum and as to their real value.

The manufacture is as follows: An alumina containing lime (limey clay) and a small proportion of iron is steeped in ordinary strong muriatic acid and dissolved as far as possible. The concentrated fluid cleared from the alumina that remains undissolved is drawn off and sold in bottles as *Chloralum* (the name is to be ascribed to its containing chloride of aluminium). The sediment remaining is evaporated, together with the fluid remaining in it, and then dried; this yields the *Chloralum powder.* Cotton or wadding is dipped into the chloralum itself, saturated with it, pressed out, dried, and becomes *Chloralum wool and wadding.*

The arsenic, lead and copper contained in the preparations are to be ascribed to the impurity of the solvent employed, muriatic acid, and to the apparatus in which the alumina is dissolved.

The real value of the contents of a bottle of chloralum, which is sold at 15 sgr. (1s. 6d.) is not to be computed as above 2 sgr. (rather more than two-pence). The value of chloralum powder, which is sold in tin canisters at 5 sgr. (6d.) cannot be placed higher than 1 sgr. (rather more than one penny), seeing that it is but dried sediment. The chloralum wadding, which is sold for 20 sgr, (2s.) is only worth ½ sgr. (rather more than a half-penny), at the utmost. A solution of 10 g. of sulphate of alumina in 1 lb. of spring water would be a perfect substitute for the above preparations, all the component parts of which, excepting the chloride of aluminium, are to be regarded as impurities or poisons, and this solution would not exceed 1 sgr. in value (rather more than one penny).

To test the value of chloralum as a disinfectant, similar quantities of sewage were treated with chloride of lime, alum, green vitriol, chloralum, quicklime and chloride of magnesium, and the clarified solution was tested for its contents of organic impurities (putridity), by means of an alkaline solution of silver. The effective value of this disinfectant and purifier may be gathered from the following figures:—

Chloride of lime.	disinfectant.	100.0	per cent.	organic matter.
Quicklime.	"	84.6	"	"
Alum.	"	80.4	"	"
Green vitroil.	"	76.7	"	"
Chloralum.	"	74.0	"	"
Chloride of magnesium.	"	57.4	"	"

Thus the disinfecting and purifying powers of chloralum stand below those of alum, or sulphate of alumina and copperas (protosulphate of iron), which further recommend themselves by their much greater cheapness.

To sum up the argument concerning the value and composition of the preparation of chloralum; 1. The preparations of chloralum have nothing in common with the similarly sounding chloral hydrate, and are, in point of fact, mixtures of chloride of aluminium, 2. The preparations of chloralum contain chlorine combinations of lead, copper and arsenic, which render their employment not free from danger, and which would render their employment as a medicine or as an astringent for open or suppurating wounds dangerous. 3. The price of the preparations of chloralum bears no relation either to their nature or their effect. Considering that the liquid chloralum yields a clear profit of at least 700 per cent., and the wadding 400 per cent., the limits of honest trading may be considered as overstepped. 4. The result of these experiments is that chloralum and the preparations made from the same must be classed among the worthless arcana, and in the interests of the public health, as well as in the material interests of the public, a most decided warning must be given against the purchase of the same.

THE MICROSCOPE IN PHARMACY.*

BY HENRY POCKLINGTON.

There is little doubt in my mind that so far as pharmacy is concerned the microscope is yet in its infancy, but that it will at no distant date make a rapid stride towards an active and useful manhood. The same might have been written a very few years since of the microscope in medicine, but it has ceased to be true lately, and is, thanks to the new regulations of the Royal College of Surgeons in England, not likely ever again to be true. The utility of the microscope in pharmacy, by which term I mean pharmaceutical science, not mere shop-keeping, is not, perhaps, so obvious as in the sister science of healing, but a little inspection will show abundant circumstances in which the microscope is not only of service, but indispensably so. I hope, in the course of my papers, to bring forward some cases in support of this proposition, and in doing so to afford to non-microscopists such information as may enable them, if the possessors of an instrument, to put it to immediate practical and technical uses.

To meet the case of those, especially the students in provincial

* From the Pharmaceutical Journal and Transactions.

classes, who have not an instrument, but are intending to purchase, I have thought it advisable to give a few general hints as to the choice of a microscope suitable for the use of a pharmaceutical or medical student, and to add a few lessons in practical elementary microscopy; which hints advanced students may skip if they choose. I am induced to write upon this point, because I have lately found many who have deprived themselves of the assistance the microscope would afford, under the impression that no instrument likely to be of the slightest service could be purchased at anything like a reasonable cost. This might have been true a few years since, but it is so no longer. Any of our leading makers will supply a good useful microscope, with all necessary lenses and apparatus, at a cost not exceeding £10. The instrument I have myself used cost me some years since less than £6, and I am not disposed to throw it aside in favor of any more showy and costly stand.

The essentials of a good working microscope may be very briefly summed up. The stand should be steady, and capable of being used vertically or adjusted to any degree of slant up to the horizontal for drawing with the *lucida*. The stage must be roomy, very firm, and have a good aperture. The mirror should be large, and have a plane as well as a concave reflecting surface, and must be adjustable as regards focus, in addition to being capable of being thrown aside from the axis of the instrument for the purpose of oblique illumination. The lenses should give a clear flat field, and a power ranging from 20 to 200 diameters; and the height of the eyepiece from the table, when a high power is used, should not exceed 10 or 12 inches.

Such an instrument, with the addition of a polariscope and fittings, will suffice for the ordinary work of either the pharmacist or the medical man, and may be purchased for £7 of any half-a-dozen good makers in town and country. There are so many makers whose instruments answer the requirements of students, and are sold within the limits we have given, that we hesitate to particularize any; but in common justice I am bound to say that I have received from Messrs. Swift, of London, and Winspear, of Hull, the utmost courtesy and assistance in my many miscropical emergencies. The latter maker has especially been always ready to carry into effect any economical "dodge" to which fancy or the force of circumstances may have impelled me, and his "Student" strikes me as being so pre-eminently a student's instrument, that it affords me much pleasure to mention it in this place. I have seen and used the Student's or other cheap instruments of Messrs. Beck, Wheeler, Collins and others, of London; Dancer, of Manchester; and Husbands, of Bristol; and have no hesitation in recommending my readers to their very "tender mercies," in common with the not less worthy brethren for whose names I have no space.

In judging a microscope, the purchaser should see that the

mechanical portions of the stand are well made, that the rack and pinion work smoothly, and the fine adjustment can be worked without throwing the object under view out of the field. This latter fault, known as "twist," is so excessively annoying, that its presence ought to secure the rejection of any stand, no matter how cheap, or otherwise perfect. The stand should be firm, and the object should never "dance" under a moderate power, if even the table on which the instrument stands be shaken. The testing of the lenses is hardly possible to a beginner. He may, however, judge whether the margins of objects are seen with sharpness and absence of colored fringes. The experienced microscopist alone can form a just opinion of the quality of a reasonably good lens, and the beginner should, therefore, either go to a good and established maker, or get the advice of a competent person before purchasing.

I have recently in these columns, given a "Chapter on Microscopy," in which were some general directions as to the use of the microscope with regard to choice of light and position, avoidance of errors of interpretation and the like, and to it I must refer my readers for information upon those points. In that article I spoke of the "lumps of sugar" blunder in microscopy. This blunder, in one form or other, so largely obtains, that I will address myself at once to the consideration of the right way of using the microscope for the examination of animal, vegetable or mineral substances.

Those objects that do not require preparation.—These are, apart from "mounted slides," the reverse of numerous, and will almost all of them require to be viewed as opaque objects by reflected light. The use of reflected light is only admissable with low powers, unless special apparatus be made use of, and does not require much explanation. A "bull's eye" condenser is generally used to increase the amount of light reflected by the object under examination, and the adjustments of this do not possess a very wide range. The beginner should bear in mind that too much light is worse then too little, and should contrive so that a larger field is illuminated than can possibly be occupied by the lens. The reason of this is, that the better portion of the condenser alone may be made use of, and that the peripheral portions of the impinging cone, usually coloured from the want of achromatism of the condenser, may not enter the objective. *Usually*, but not always, the illuminating pencil should fall as vertically as possible upon the object. Any variation from this will involve certain errors which must be eliminated by comparison of appearances, produced by varying the angle at which the pencil is incident. It is, of course apparent that the safest plan is to vary the angle under any circumstance, and to view every object under as many conditions as possible. The merely superficial view of an object, which alone is possible by the use of reflected light under such simple conditions as I have now considered, is of so little value in giving anything approaching a knowledge of the nature of

an object under observation that every student will desire to prosecute his researches considerably further, and to investigate the texture or structure. For this some preparation of the object is necessary.

Preparation of subjects.—By this I do not necessarily mean "mounting" as understood by microscopists. Preparation is one stage, an early one, of which mounting is a later stage, but not a necessary consequent. Immersion of the subject in some fluid of different refractive powers from itself is the simplest mode of preparation, and often the only necessary one. This is the case with many vegetable structures which are so transparent and thin as only to require immersion in water to fit them for examination. If the student wish to examine the petal of a flower, such as that of the pimpernel, his simplest plan is to take a glass slip, place the petal upon it, add a drop of water, and place upon it a cover of thin glass; in a very short time he will be able to make out the structure of the petal with tolerable facility and accuracy. Many structures require a fluid of a higher refractive power than water. Such of these as come within the scope of the pharmaceutical microscopist I shall treat more in detail presently. The major portion of the substances examined microscopically require some preliminary treatment of a chemical or a mechanical nature. We will regard these separately.

Chemical.—The value of reagents in microscopy does not seem to be so generally known to amateur microscopists as it should be. A somewhat long experience of them leads me to assert that little can be learned without their use. They are not numerous; acetic acid (fort. and dil.), sulphuric acid (dil. 1–4), nitric acid (1–4 dil.), iodo-ioduret of potassium in solution (1 gr. iodine, 3 grs. iodide of potassium, 1 oz. water), strong syrup, ether, nitrate of barytes in saturated solution, nitrate of silver (2 per cent. sol.), and oxalate of ammonia are those chiefly useful, and will be separately mentioned under the head of the purposes to which they are applicable. These reagents should be kept in small bottles, to which are adapted as stoppers the capillary tubes with india-rubber tied over the top, now so commonly sold as "dropping tubes." By the aid of these tubes an exceedingly minute drop may be applied to any desired portion of an object under observation, and the exclusion of foreign matter easily secured. It is hardly necessary to add that all chemicals used must be *pure*. Boiling, a mechanico-chemical operation, is often of great service in promoting the isolation of portions of a structure, but should not be had recourse to if less violent means will answer the end. Simple maceration in cold or warm water will be found of great service in the study of vegetable structure. The same may be said of maceration in syrup, glycerine, and dilute acids or alkalies, with respect to mineral and animal substances.

Mechanical.—Downright dissection when animal or vegetable structures are dealt with is generally the most useful, certainly the

most instructive. Small scissors, scalpels, and sewing-needles fixed in handles are the tools generally used. For making sections a razor is best. The object, if small and soft, may generally be best held between the finger and thumb; if hard, held against a piece of glass, or fixed in a proper section cutter. This last instrument consists of a tube having a movable bottom. This bottom is attached to a screw with a fine thread. A milled head outside can be revolved between the finger and thumb, and the whole is usually so arranged that one revolution of the milled head raises the bottom of the tube, and also the object placed in the tube, through one fifty-sixth of an inch. Any less distance is, of course, easily got at by dividing the milled head into 10 or 20 proportional parts. With a little practice the student will be able easily to dispense with this somewhat costly apparatus, at all events for his ordinary laboratory work. Compressing and "teasing" are of occasional service, but patient dissection is by far the best, and should be always followed when possible.

It is perhaps not worth while to extend these papers by giving long explanations of the mysteries of mounting. The art of mounting, apart from that of preparing the objects, may be summed up very briefly. It consists in fastening down the thin covers, so that they shall not be displaced by accident, or suffer the contained fluids to escape. When Canada balsam, Mr. White's dammar medium, and glycerine jelly are used, the object "prepared" is also mounted, and may be placed in a cabinet. When fluids are used, the edge of the cover must be luted down; for which purpose nothing is better than Mr. White's dammar, Bell's cement, or Bate's photographic varnish. All fluid having been removed from the edges of the cover, a thin coat of varnish is to be laid on and allowed to dry. A second, third, and fourth coat will finish the job, and make all secure. Those who require further information on this subject will probably go to the numerous and excellent text-books now before the public, and the subject is hardly one that can be discussed at length in these pages.

I now come to the more immediate subject of these papers, the using of the microscope in pharmacy. One of the great uses of the microscope in pharmacy is that of a detective to discover adulterations. But its great use is that of an educational agent, in that it enables the pharmacist to become familiar with the nature and structure of many of the substances with which he deals. To a certain extent these are related. The microscope can only be used as a detective by those who have already been educated by it into a knowledge of the nature and structure of the *genuine* substances they wish to distinguish from the spurious intermixed with them. For the present I do not propose to treat of the microscope as an educator, pure and simple. I shall deal with it as a detective, and as teaching pharmacists to become detectives also. *How to detect*

adulterations by means of the microscope is then my subject henceforward, to the end of these articles.

The use of the microscope in the detection of adulterations would appear to date from a time not more remote than 1850, when Dr. Hassall laid before the Botanic Society, of London his historic paper on the adulterations of coffee. Previously to the researches of Dr. Hassall and his *collaborateurs* on the *Lancet* commission, it was commonly believed that, so far as many articles of common use were concerned, chemistry was utterly powerless to detect adulteration, and that it was vain to expect to be able to place any check upon the dishonesty or malpractices of the vendors of those articles. So secure did the vendors of adulterated food, drinks and drugs feel themselves, that the publications of Dr. Hassall's reports was as if a thunderbolt had been thrown into their camp; and to this day his papers exerted not an unimportant influence for good. Although the practice of adulteration still exists to a frightful extent, and has become so respectable that a late member of the Government of this country has had the boldness to say that it is a mere species of "competition," and therefore perfectly allowable, yet it is not so prevalent with respect to articles commonly used for food and drink as prior to 1850. Nor, so far as my experience goes, does adulteration take so dire a form as before the publication of the *Lancet* reports. It is, at any rate, now possible, as I have proved again and again in my own household, by dealing with respectable tradesmen, to procure articles of more than "commercial" purity.

The present movement, in some of our large towns, for the appointment of a "public analyst" is a sign of the times which members of the Pharmaceutical Society will do well to take to mind. For there is little doubt that, with increased educational advantages, the common people will become more awake to the hygienic importance of pure air, pure water, and pure food; and that, before many years are passed, there will be found but few towns, or even large villages, without a duly qualified public analyst, appointed and paid for by the ratepayers, for which post a member of the Pharmaceutical Society ought to be the most qualified person. With the idea that it may be useful to such a one, I shall include in these papers, not only notes on the detection of adulteration in drugs, but also of foods, so far as the use of the microscope is specially advantageous.

It may be best perhaps to make these articles a progressive course of instruction,—to regard first those substances which are most easily examined, and then to proceed, by as easy stages as possible, to those which require a more lengthened or difficult preparation before they can be microscopically examined; and we will wind up, if space permit, with a brief notice on the use of the microscope in the examination of such things as sputa and urine, respecting which the opinion of a skilled microscopist is often required.

We will begin with the starches, arrowroots and their allies including "foods" and "flours."

To become familiar with the microscopical appearance of the genuine article is obviously the easiest course to follow, if we merely wish to detect the presence of an adulterant in arrowroot or any other article. But, as in addition to its being of scarcely less importance to be able to pronounce *what* the adulterant is than to detect its presence, the procuring of a well-authenticated specimen is a matter of great, and sometimes insuperable difficulty, when we have to deal with articles that are only imported in a "manufactured" condition, it is necessary to familiarize ourselves with the characters of all those substances which are *likely* to be used as adulterants. This will necessitate, in the case of arrowroots, etc., an acquaintance with the nature of starch, its origin, the resemblances and differences between the starches from different plants, and the nature of any organic or inorganic substances likely to be found in company with starch naturally, or to be added as an adulterant.

We are face to face with an analytic axiom,—that those substances only are used as adulterants, as a rule (which has, as may be expected, very few exceptions), that are less costly than the genuine article, and have characters sufficiently in common with it to enable them to pass muster, or will chemically or mechanically enter into combination with it. These substances may be roughly subdivided into, those added to increase bulk or weight, and those added to blind the purchaser to faults of manufacture or inferiority of quality.

Applying this axiom to the examination of arrowroot, we shall be lead to test for cheaper starches, and in the case of the higher-priced arrowroot, the presence of a lower priced one. As a preliminary, we shall familiarize ourselves with the microscopic appearance of such starches as are commonly found in commerce, and are sufficiently cheap to form an inducement to fraudulent men to make use of them for the purpose of adulteration. Foremost amongst these is starch from the potato. Potato-starch is so frequent an admixture with articles used in food, that it is very essential the analyst should make make himself thoroughly familiar with it under all the circumstances in which it can be placed. This is the more essential, because the microscopic appearance of a starch granule *in situ*, in water, dry, in oil, resin or spirit, raw and cooked by the aid of dry or moist heat, differ so widely that he who was acquainted with it under one condition only, would fail to recognize it under any of the others. The first thing to do is to procure the starch. It is so easily prepared from that not rare article, the potato, that it is not worth while to run the risk of being perplexed with an adulterated adulterant (a "poisoned poison" is common enough) by examining the potato-starch of commerce. The simplest plan is to

examine the granules *in situ*. Slice a potato in halves, and then cut as thin a section as possible with a sharp razor. Float this off on to a thin glass, add a drop of glycerine diluted with 25 per cent. of water, and, having covered it with a glass slip, proceed to examine it with a half-inch or one-inch objective. The starch granules will be seen to lie loosely in the interior of large cells, and to vary greatly in size, from the fully formed starch granules to the exceedingly minute, almost shapeless granules lying along the centres of active growth. This wide range of form-element is exceedingly perplexing to the analyst of starches, and renders it excessively difficult in some cases to decide absolutely as to the precise nature of some of the starches submitted to him. But, although there is a wide range of size for each starch, yet each species has a tolerably well-defined average, which enables the analyst in many, indeed in most cases, to decide upon the genuineness or not, of the article.

To apply this test requires that the starch granules be isolated and prepared for observation—a matter of little difficulty, as starch is easily diffusible through water, and remains suspended long after the other constituents of the potato have subsided. Professor Attfield* gives very simple directions (' Chemistry,' pp. 368-9) for the preparation of potato-starch;—"Rasp or grate or scrape a portion of a clean raw potato, letting the pulp fall on to a piece of muslin placed over a small dish or test glass, and then pour a slow stream of water over the pulp. Minute particles or granules of starch pass through the muslin, and sink to the bottom of the vessel." The plan which I myself have adopted is substantially that followed by those who prepare arrowroot and sago for the market, and is, perhaps, on this account preferable. Pound the potato, other tuber, grain or starch bearer in a mortar to a pulp; throw the pulp into a vessel of water, and, having stirred it well, allow it to subside; collect the fibrous matter (both that which chances to swim as scum, and that which subsides before the starch), and remove it. Allow the starch to subside; pour off the supernatant water; fill up the vessel, and pour the milky water through a piece of muslin, and allow the now nearly pure starch to subside. Wash it once or twice, and then collect. Dry and put into a corked bottle. The resultant starch is "commercially" pure,† and in a fit state for microscopical examination. But, as most beginners have discovered, it is of little use to examine dried starch *au naturel* by either reflected or transmitted light. It is necessary to immerse it in some

* I must call attention to an important error into which Professor Attfield has fallen. The Professor says that wheat-starch, viewed by polarized light, does not show the black cross given by potato-starch. The black cross of wheat-starch is most marked and characteristic. The effects of the two starches upon a selenite differ slightly. Rice-starch also gives a "cross."

† Treatment with alcohol and ether is necessary to render it chemically pure, but would be obviously out of place for our purpose.

fluid, than which nothing is better than equal parts of Price's best glycerine, sp. gr. 1240, and water. The use of a quarter-inch object is desirable.

The analyst should make careful measurement of a number of the granules, and take the mean of the whole. Here we may profitably consider the simplest means by which this may be effected. Dr. L. Beale recommends the use of the camera lucida or neutral-tint reflector, and the stage micrometer as affording the most "simple and efficacious manner of measuring objects." The neutral-tint reflector is simply a piece of neutral-tinted glass arranged at an angle of 45° to the eye-piece, and can be procured of any optician at a cost about of 7*s*. 6*d*. The stage micrometer (cost 5*s*.) consists of a piece of glass whereon are ruled lines separated by thousands of an inch (100 and 1000 per inch are most commonly used.) The micrometer is arranged on the stage of the instrument, and the microscope inclined on its axis to the horizontal, the neutral-tint being slipped into its place on the eye-piece. The observer, looking down into the reflector, sees apparently on a piece of white paper placed on the table beneath it the outline of the micrometer divisions, and can with the greatest exactness trace them with pen and ink or pencil. A set of these tracings should be made from each objective, and either lithographed or struck off by letterpress, that a copy may be affixed to each drawing made from the same objective. Removing the micrometer from the stage, a slide of the starch is substituted, and the outlines of a number of the granules carefully traced by the side of the outlined micrometer divisions. It is clear that the ascertainment of the exact size of each granule is a matter of the greatest facility. Ramsden's and Jackson's micrometers are supplied with "first-class stands" for the same purposes, and possess many advantages, but in point of inexpensiveness and simplicity are not to be compared with the very simple plan propounded by Dr. Beale. If only rough measurements are required, it will suffice to place an ordinary rule, divided to one-tenth of an inch, on the stage beside the object or micrometer, and to compare it or the micromatic divisions with the divisions on the rule, by observing the latter with the left eye, whilst the right is engaged with the microscope. This simplest of plans is not, however, sufficiently accurate to be used in microscopic analysis.

Specimens of the starch as prepared should be mounted in syrup, glycerine, and for examination by polarized light in "dammar."* The specimen in syrup will be found serviceable in the examination of many samples of honey; that in glycerine will show the modifying action of a dense fluid upon the granule. But for general comparison it is essential that a portion should be taken

* So many microscopists have a difficulty in procuring "microscopical dammar," that it will, perhaps, be of service to say that it may be procured in a very convenient form of Mr. Walter White, M.P.S., Norwich.

from the stock-bottle; for no medium, so far as I know, can be relied upon for the preservation of starch in its normal condition as to size and shape. Careful study should be made of the changes induced by moist and dry heat, and preparations of each should be put up in dammar and in glycerine (25 per cent. water), that the student may be prepared to recognize the granule under all the modifications produced by boiling, roasting, and even fine grinding.

We have dealt thus fully with potato-starch, because it is a type of all the starches, and is, in addition, the one most commonly met with as an adulterant, and the adulterant of adulterants.

(To be continued.)

ON THE FLUID EXTRACT OF CHESTNUT LEAVES.*

BY JOHN M. MAISCH.

In 1862,† Mr. G. C. Close called attention to the beneficial effects of the leaves of the chestnut tree, *Castanea vesca*, Lin., var. *Americana*, in whooping cough. I have since learned that the leaves are popularly used and highly valued in various parts of this country as a remedy for this disease, and that in some sections of New Jersey, and also of the Southern States, peach leaves are employed for the same purpose; of the latter, Dr. F. P. Porcher‡ remarks: "A tea of the leaves is a favorite domestic palliative in whooping cough, and in most pectoral affections."

The favorable effects of chestnut leaves in the disease mentioned has since been confirmed by the observations of several physicians, and from cases which have come under my notice, their use appears not only to frequently alleviate the severity of the attacks, but even to break the paroxysms, leaving merely a cough attended with mucous expectoration, which gradually yields to ordinary expectorants. Chestnut leaves, however, are not a specific against pertussis, though its effects are perhaps beneficial in a majority of cases. In 1868, during the prevalence of whooping cough in this city, two of my children being attacked with it, derived no benefit whatever from their use, nor had bromide of ammonium and hyoscyamus any good result; but the spasms were allayed by assafœtida, which was given in the form of syrup prepared by the formula published on page 396 of this volume.

Dr. A. S. Gerhard, of this city, at whose request I have collected chestnut leaves since 1867, has used this remedy quite extensively,

* From the American Journal of Pharmacy, Dec., 1871.
† Proceedings Amer. Phar Assoc., p. 236, Amer. Jour. Pharm., 1863, p. 66.
‡ Resources of the Southern Fields and Forests, p. 198.

at first in the form of infusion, one-half to one ounce to the pint, which we freely administered; subsequently I prepared a syrup, and a fluid extract, the latter preparation being greatly preferred by him on account of the small dose required, which is from a few drops to a teaspoonful, according to the age of the patient and the severity of the symptoms.

Obviously the time at which the leaves are collected must be of considerable influence upon whatever medicinal properties they may possess. I have collected them from the beginning of July, when the flowers were fully expanded, until the beginning of October, when gathered late in the fall, the green leaves only were selected. It had been my intention to use the leaves from the different months separately, with the view of having their relative efficacy tested; but the demand becoming unexpectedly large, the various collections had finally to be used indiscriminately. However, as far as the observations could be made, they appeared to be rather in favor of the fall collections made in September and early in October.

Chestnut leaves contain considerable tannin; their taste is not unpleasant, merely mildly astringent, without any decided bitterness. The remedy is therefore readily taken by children, whether in the form of sweetened infusion, syrup or fluid extract containing sugar. In preparing the fluid extract, the use of diluted alcohol as the exhausting menstruum was not attended with as satisfactory results as that of water, which was therefore employed. A purely saccharine fluid extract was of too thick a consistence, in consequence of the large amount of extractive matter dissolved by the water. After several experiments a small quantity of glycerine was employed, and the sugar correspondingly reduced, when a more attractive preparation of the consistency of a dense syrup was obtained.

One difficulty in the management of chestnut leaves in the preparation of fluid extract is their bulkiness and flexibility; dried in the air, they cannot, with any degree of facility, be reduced to a powder, either in the mortar or hand mill, so that their exhaustion cannot be effected by percolation. After cutting and bruising them, they are covered with hot water in an enamelled kettle and digested over night, when they are expressed; the digestion and expression are repeated twice with fresh portions of water, and the three infusions, each one mixed with glycerine or a portion of the sugar, evaporated to a small bulk when they are mixed and the evaporation continued until the proper measure is obtained; it is then set aside for several days and decanted from the small quantity of sediment.

The proportions used are as follows: Chestnut leaves, dried, cut and bruised, sixteen troyounces; glycerine, five troyounces (f℥iv); sugar, eight troyounces; hot water, a sufficient quantity; the fluid extract to measure sixteen fluidounces.

NOTE ON THE DIGESTION OF MINERAL SUBSTANCES.*

BY RICHARD V. TUSON, F.C.S.

Professor of Chemistry in the Royal Veterinary College.

Physiologists and chemists have hitherto entertained the belief that the principal, if not the sole function of the pepsin and acid contained in the gastric juice is to render soluble the albuminoid constituents of food, and thus prepare them for the subsequent process of absorption.

Conceiving, however, that it would be extremely interesting to study the effect, if any, of the solvent constituents of the gastric juice upon mineral substances, especially those employed as medicines, I have set myself the task of investigating this subject. The inquiry is yet but in its infancy; nevertheless the results already obtained are sufficiently positive and striking to induce me to "claim date" by placing on record the following experiments:—

Experiment 1.—A mixture of calomel† and distilled water containing 2 per cent. of hydrochloric acid.

Experiment 2.—A mixture of calomel, pepsin, ‡ and distilled water.

Experiment 3.—A mixture of calomel, pepsin, and distilled water, containing 2 per cent. of hydrochloric acid.

These mixtures were placed in glass vessels, and kept at 38° C. (100·2 F.), *i. e.* at about the temperature of the body, for twenty-four hours, during which time they were occasionally stirred or shaken. They were then thrown on to filters of Swedish paper, and the filtrates saturated with sulphuretted hydrogen. The filtrates from Experiments 1 and 2 remained unaltered. The filtrate from Experiment 3 yielded a precipitate of sulphide of mercury.

The results of these experiments therefore show that neither dilute hydrochloric acid (2 per cent.) nor pepsin alone is capable of dissolving calomel, but that when these agents are mixed they do affect its solution, and, consequently, that the digestion of calomel, so far as its solution in artificial gastric juice is concerned, is brought about under the same conditions as that of the albuminoids.

The importance of this observation will become apparent, when it is borne in mind that it offers an additional explanation to those already published of the manner in which calomel enters the circulation in order that it may exercise the many therapeutic actions with which it is accredited. Whether or not oxide of antimony, sulphide of antimony and other so-called insoluble remedies, are dissolved by pepsin and dilute acid, is a problem which remains to be solved.

* From the Pharmaceutical Journal, London, December 1870

† The calomel employed in all the experiments was previously tested as to its purity.

‡ Pepsina porci, prepared by Messrs. Bullock and Reynolds.

The influence of different acids, the chemical composition and characters of the dissolved mineral, and its behavior when subjected to dialysis, also the action, if any, of peptones on inorganic bodies, have likewise to be determined; but these matters, together with many others, will form the subject of future communications.

Editorial.

THE present issue of the JOURNAL is so far behind time as to be almost beyond the reach of apology. The delay was, however, caused by circumstances over which neither editor nor publisher had the slightest control. Most of our readers are, doubtless, aware of the late action of the printers, whereby nearly every office in the city was rendered destitute of hands. In the office in which this paper was printed not a single compositor remained. In this state of circumstances we applied to the Publishing Committee for advice, as to whether we had not better have the printing done in some other city. In view of the supposition that arrangements would shortly be made with the printers so that work could be resumed, it was decided to defer the publication until matters assumed their ordinary shape. This result has not yet come about, and it is only with the greatest difficulty that we are enabled to issue the present number. We hope this explanation will prove satisfactory. We may also intimate that from present appearances it is likely that we shall also have to ask indulgence for our May number, which, we fear, cannot possibly appear in good time.

THE ALCOHOLIC STRENGTH OF TINCTURES.

It must have occurred to every druggist that the menstrua for tinctures would admit of a greater variation of alcoholic strength than the Pharmacopœia allows, and that the appearance and permanence of this much used class of medicines would improve materially if this was the case. Take, for example, tincture of calumbo. With the diluted alcohol of the U. S. P., or the proof spirit of

the British authority, it is almost, if not quite impossible to make a presentable preparation and at the same time exhaust the root of its virtues. Percolation through the powdered drug, however coarse the degree of comminution, invariably yields a viscid and turbid tincture loaded with inert matter. To macerate the root in thick slices is our only resource if a clear preparation is our aim, and by this method we doubt if fifty per cent of the bitter principle is extracted.

Many other instances of a want of adaptation of the menstruum to the drug might be cited, but we refer our readers to a paper on Tinctures by Mr. Rother, of Chicago, and also to the paper of Mr. Greenish, on "Tincture of Cinnamon," which, together with the discussion to which it gave rise at a late meeting of the Pharmaceutical Society of Great Britian, will be found in another part of this Journal. We are glad to see that the subject is attracting the attention of pharmacists and pharmaceutical writers, in England, as well as on this side of the Atlantic, and hope that in the next edition of our Pharmacopœias we shall see some result of their labours.

It may be argued that to multiply the menstrua for tinctures would only lead to the confusion of the druggist, as well as the preparation involved. It would certainly be better to employ as few menstrua as possible, if only for the sake of simplicity and uniformity, but on no account should the preparation itself be sacrificed to such considerations. In the matter of facility in preparation, it would be as easy to make menstrua of ten different strengths as of two. In all cases, at all events on this continent, the operator has to prepare the different strengths specified before making the tincture, for the spirits of commerce do not coincide in alcoholic contents with those of the Pharmacopœia.

When the dose of a tincture is large, the alcoholic strength should be reduced to the lowest practicable point compatible with solvent and preservative effect. The proof spirit tinctures of the B. P. would, in this respect, admit of improvement. This is evident when we remember that the diluted tinctures of the U. S. P., are generally as permanent and reliable as those of our standard. Yet the former are weaker by ten per cent of absolute alcohol, by weight. This is a consideration not only in regard to the patient's dram, but the druggist's pocket.

In some instances it would be better if the alcoholic strength

was increased, as in the case of the tincture of columbo and others of an albuminous or mucilaginous character; and also in those preparations which contain a constituent which is essentially resinous, or mainly composed of volatile oil.

BOTANY AS AN ESSENTIAL OF PHARMACEUTICAL EDUCATION.

A spirited discussion regarding the exact position in the curriculum of pharmaceutical studies which must be assigned to botany has, for some time, been carried on in the English journals. The immediate cause of this expression of opinion was a lecture on "pharmaceutical education and its relation to pharmaceutical examinations," which was delivered before the Chemists' and Druggists' Association of Manchester, by Mr. Siebold, a well-known druggist of that city. The position assumed by the lecturer is rather antagonistic to the powers that be, and for this reason may be in somewhat bad taste, but nevertheless much that is advanced savors of sound sense, and merits serious consideration. It is not our intention to review the lecture in detail, but merely to allude to the views held in regard to the importance of botany as a department of pharmaceutical study. After speaking of the absolute necessity of a thorough knowledge of materia medica and chemistry, the lecturer asserts that botany cannot be classed with these, but assumes a position of much less consequence. This view is supported by the following remarks:—

"I venture to assert that a chemist and druggist can fulfil all his professional and business duties in the most perfect and efficient manner without knowing much of botany, and unless this assertion can be disproved you must admit that the study of that science need not form part of a pharmacist's education. No doubt it is very interesting and highly instructive and cultivating to the mind, but so are astronomy, anatomy, physiology, and other branches of the great domain of natural science, which nobody deems necessary to force upon us. In private conversation on this subject, I have met with the reply that many chemists in country districts collect or cause to be collected some of the leaves, roots, etc., used in pharmacy from plants growing in their neighborhood, such as digitalis, conium, valerian, and others, and that they could not do this without being able to recognize those plants. This is very true: and

although by far the greater number of chemists do not collect and dig, but purchase their drugs in the dried state as well as the narcotic extracts made from the fresh herbs, I should be the last to dispute the desirability of chemists and druggists knowing the indigenous plants of the British Pharmacopœia. But there is a vast difference between being able to recognize a few dozen fresh plants and possessing an intimate knowledge of structural and systematic botany. Upon drying parts of fresh plants, such as henbane leaves, for instance, their appearance changes so that the shape and other characteristics of the fresh articles furnish no description of the substances in the dried state, in which they only can be kept by us. For the latter we are dependent upon our knowledge of materia medica, and students of this science cannot be too strongly recommended to avail themselves of a good collection of specimens as supplied by several wholesale houses. But though I feel persuaded that the study of botany is not needed by our young men for the purposes of their profession, I do not forget that it is required in the minor and major examinations, and must therefore advise them not to neglect it, but to make themselves familiar with the organs of plants and their functions, but above all, with the characteristic features of the indigenous medicinal plants. Here, as in the study of materia medica they are very useful, and collections of dried plants as well as colored plates of the fresh ones are of great service. If the pupil has the chance or opportunity, he should get up an herbarium by collecting and drying his own plants.

We have presented Mr. Siebold's arguments at length, because we are aware that similar views are held by many of our readers. At the last meeting of the Council, one of the members expressed himself strongly to the same effect, and urged a change in the value of botany as one of the subjects of examination. We should like the subject to be ventilated, and if this article proves the means of provoking discussion, the object of the writer will have been accomplished.

MEDICAL DECLARATION RESPECTING ALCOHOL.

The cause of temperance has received an unexpected accession of power by the recently published medical declaration respecting alcohol. To this document some two hundred and sixty-eight signatures have already been affixed. When we say that these include the names of such eminent men as Aitkin, Bennet, Bird, Carpenter, Bence Jones, Letheby, Hassal, Parker, Woodhouse and Watson,

several of whom are connected with the Medical Staff of the Royal Household, it will readily be seen that the affirmation carries with it a good amount of influence. The declaration is worked as follows:

"As it is believed that the inconsiderate prescription of large quantities of alcoholic liquids by medical men for their patients has given rise, in many instances, to the formation of intemperate habits, the undersigned, while unable to abandon alcohol in the treatment of certain cases of disease, are yet of opinion that no medical practitioner should prescribe it without a sense of grave responsibility. They believe that alcohol, in whatever form, should be prescribed with as much care as any powerful drug, and that the directions for its use should be so framed so as not to be interpreted as a sanction for excess, or necessarily for the continuance of its use when the occasion is past.

They are also of opinion that many people immensely exaggerate the value of alcohol as an article of diet; and as no class of men see so much of its ill effects, and possess such power to restrain its abuse, as members of their own profession, they hold that every medical practitioner is bound to exert his utmost influence to inculcate habits of great moderation in the use of alcoholic liquors.

Being also firmly convinced that the great amount of drinking of alcoholic liquors among the working classes in this country is one of the greatest evils of the day, destroying, more than anything else, the health, happiness and welfare of those classes, and neutralizing, to a large extent, the great industrial prosperity which Providence has placed within the reach of this nation, the undersigned would gladly support any wise legislation which would tend to restrict within proper limits the use of alcoholic beverages, and gradually introduce habits of temperance."

It is barely possible that the last part of this document is a little too hard on medical practitioners—at least, from the tone of the medical journals this seems to be the general opinion. Be this as it may, it is just as well to remind physicians of their responsibilities, for in this matter they are indeed great, and we are assured that a concerted action on the part of medical men would do more to prevent intemperance in its earlier stages, than any other influence that could be brought to bear on it.

REGISTRAR'S NOTICE.

REGISTRATION FEES.—The attention of all in business as Chemists and Druggists is called to the fact that the annual pay-

ment is due on the first day of May. So as to prevent any overcrowding, remittances should commence at once. The correct list will be published in the June number of the *Journal*.

The Registrar has received enquiries from England as to the whereabouts of W. A. Porter, who left Toronto about November 1st, endeavoring to obtain a situation as a druggist's assistant. His mother having heard nothing from him since that time, fears something may have happened to him. He was of about 5ft. 4in,, light curly hair, and slight side-whiskers. Dressed in black, with black scarf. Any trace of him will be thankfully received by addressing H. J. Rose, Toronto.

Editorial Summary.

TANNIN AND GLYCERINE.—According to R. Rother, (*Chicago Pharmacist*), commercial tannin contains a green resinous matter, together with various metallic impurities, as bits of copper, iron, etc., derived from the vessels in which the tannin was dried. These impurities spoil the appearance of the much-used solution of tannin in glycerine, by rendering it turbid or imparting color. Mr. Rother proposes to obviate this by employing the following formula :—

Tannin	8 troy oz.
Glycerine	4 "
Alcohol	8 fluid oz.
Water	8 "

Mix the alcohol and water; add the tannin and apply heat until solution is effected. Filter hot, add the glycerine and evaporate by a careful heat until the solution weighs 15 troy ounces. This preparation will contain half its weight of tannin.

TANACETIC ACID AS A SUBSTITUTE FOR SANTONIN—T. Marletta (*Jour de Pharm, et de Chimie in Pharm. Jour*) says that tanacetic acid obtained from the heads of the common tansy, (*tanacetum vulgare*), operates as a vermifuge in the same doses as santonin. The acid possesses a sharp, bitter taste : is insoluble in water, but soluble in alcohol and ether. Most of its salts are crystallizable.

Correspondence.

To the Editor of the Canadian Pharmaceutical Journal.

DEAR SIR,—I think your correspondent, "Soothing Syrup," must be remarkably obtuse if he cannot see that it is morally wrong, or unjust, to give a percentage to gain the physician's prescriptions. To say the least of it, it is a small piece of business. In the first place, it is robbing the doctor's patients; to this both physician and druggist are equally guilty. In the next place, it is a direct injury to the honest or straightforward druggist; and "Soothing Syrup" must be a very narrow minded druggist if he cannot put forth a better argument to convince me, and many others, that the percentage system is not morally wrong and unjust. If it can be shown that it is an injury to a fellow druggist, it must be wrong.

Now one of my particular friends goes to Dr. H. He gives her a prescription, and directs her to a certain druggist; but instead, she comes to me, and gets the prescription filled. So far, so good. However, in a day or two, she sees the doctor, who asks her how she is, etc. In reply, she says, "I'm pretty well, but the medicine seems to go to my eyes and make them sore." "Yes; did you get it where I sent you?" "No; I got it at so-and-so's." "Oh!" says the doctor, "he didn't give you the right stuff! He does'nt know anything about it; the prescription was *written* in *Latin*!" The prescription was as follows:

R.	Pot. Iodidi	℥ i.
	Tr. Gentian	℥ y.
	Aqua	℥ vi.

Sig.—A teaspoonful after each meal.

Now, anyone professing to be a druggist, must be a blockhead if he could not read such a simple prescription. Here is another case: A customer of mine goes to Dr. —, and gets a prescription, with directions to go to a certain druggist, but not having the money, he comes to me (probably after being refused credit at the other place, as such prescriptions are generally C.O.D. when the Dr. cannot get the money himself). I made arrangements for him to do some work for me, and so made up the prescription, and of course my label was on the bottle. But, behold you, in a few hours this medicine is sent back by a boy, with, "The Dr. says this is not the right stuff, he says he won't use it, etc." Now, it is unnecesssary to give the prescription here, it being quite a simple one. Here was a dollar's worth of medicine, compounded for a certain case, left on my hands, because the bottles bore *my labels* instead of the percent-

age druggist's, and of course would get no 30 or 40 per cent. from me; so he would not use the medicine, and made his patient take it back and go to his percentage druggist. Now, Mr. "Soothing Syrup," is this not a direct injury to me? The same thing occurs probably every day. Your customers are going to the doctor to get medicine or advice, and the prescriptions they get would naturally come to the druggist that they are in the habit of dealing with, but for the doctor. He recommends them to his percentage store, and thus you are cheated out of both prescription and, in all probability, their total custom. Perhaps your customer asks the doctor if he cannot come to you, and get his prescription filled. Then it is nice to be told you know nothing about prescriptions, they are written in Latin, it is not the right stuff, or you do not keep good drugs, etc.

No matter whether the patient has paid the doctor's fee or not, the percentage druggist is sure to charge enough over and above the regular price, to allow 30, 40, or even 50 per cent. to the doctor, so that the patient is mulcted out of that sum at any rate. I intended to have sent this for last month, but thought some one better able would have answered "Soothing Syrup."

CERA ALBA.

Answers to Correspondents.

H. H.—The recipes you desire are appended:

Oil of Spike.—

Barbadoes Tar	2½	pints.
Spirits Turpentine	4	"
Sulphuric Acid	3	ounces.

British Oil.—

Barbadoes Tar	2	pints.
Oil of Amber	1	ounce.
Spirits Turpentine	6	pints.

Balsam of Honey.—

(1)

Balsam of Tolu	1	pound.
Honey	1	"
Alcohol	1¼	gallons.

or,

(2)

Balsam of Tolu	2	ounces.
Styrax	2	"
Opium	½	drachm.
Honey	8	ounces.
Alcohol	2	pints.

Cheap Scent for Hair Oil.—

Oil Lemon	2	oz.
" Bergamot	1	oz.
" Lavand		
" Caryoph		
" Cassia, of each	½	drachm.

W. Lloyd.—The text books recommended by the Council are.—Materia Medica and Pharmacy: The *British Pharmacopœia* and *United States Dispensatory;* Botany: Gray's *Lessons in Elementary Botany;* Chemistry: Fownes' or Attfield's *Chemistry.* If you will consult the number of this Journal for last October, you will find an article entitled, "What to Study," which enters into the subject much more thoroughly than we could attempt in a note like the present. We would refer you to this for further information.

H. McL.—We should have been pleased to conform to your wishes regarding the publication of the questions given at the last examination, but at the last Council meeting the examiners expressed themselves to the effect that they would rather the questions should not be printed. You can, however, procure a written copy by paying the Registrar therefor.

E. S.—Cementing Leather on Metallic Surfaces.—Spread over the metal a thin, hot solution of glue, and apply the leather, which should have been soaked, previously, in a warm infusion of nut galls. The contact should be preserved by means of pressure until the film is dry.

Books and Pamphlets.

Proceedings of the American Pharmaceutical Association at the Nineteenth Annual Meeting, held in St. Louis, September, 1871; also the constitution and roll of members. Published by the Association.

For interest and utility there are few periodical publications on Pharmaceutical subjects which equal the annual reports of the American Association. The minutes of the meeting are far from being merely local in interest, as the discussions to which the papers give rise contain an inestimable amount of practical information. The most valuable feature is, undoubtedly, the "Special and Volunteer Reports and Essays." In the volume before us this department extends over one hundred and fifty pages, and embraces papers on the following subjects:—The Drug business; its relation to

Medicine and Pharmacy. On Apprenticeship; Pharmaceutical Education; Pharmacy in Canada; Precautions in Dispensing Poisons; On the effects of Glycerin in Pharmaceutical Preparations; On Powdered Camphor; On Medicated Waters; On Aromatic Sulphuric Acid; The Morphia Strength of Tincture of Opium; The preparation of Syrups without Heat; On Fluid Extract of Senega (two papers); Note on Cartharides and a Blistering Liquid; Note on Officinal Extract of Jalap; On the Solid Alcoholic Extracts of the U.S.P.; On Suppositories; On Urethral Suppositories; Artificial Mineral Waters; Practical Notes and Observations; Note on the Exports of Virginia, A.D. 1610; on the Preservation of Herbs; Note on Rhubarb; Note on Pareira; On Wild Cherry Bark; On Insect Powder; On the so-called African Saffron; Olive Oil and its Adulteration; Rennet and Pepsine; On Extract of Meat; Note on Litmus Paper; An Apparatus for Preparing Liquor Ammonia; On Commercial Bicarbonate of Soda; On Subcarbonate of Iron; Tartar Emetic; On Citrate of Magnesia; On the amount of Magnesia and Citrate Acid contained in Commercial Solutions of Citrate of Magnesia; Glycerine as it exists in Commerce; Note on Chloral; On Sulphuric Acid.

We do not think that such a large number of valuable papers has never been before presented at any of the meetings of the Association. This fact speaks well for the progress of Pharmacy in the United States, and is an effectual contradiction of the oft repeated statement that the worship of the almighty dollar is the whole head and front of American Pharmacy.

The report on the progress of Pharmacy is concise in detail and comprehensive in extent. It takes up some two hundred and eighty pages of the present volume, and reflects great credit on Mr. Wenzell, who, we believe, was the chief compiler.

Handicraft—A Popular Journal of Progress in the Industrial Arts, New York, Vol. 1, No. 1.

A new monthly, edited by John Phin, C. E. This publication promises to be valuable and permanent. Its articles are condensed and short, but well selected.

The Question of Quarantine—The Nature and Prevention of communicable Zymotic Diseases; a paper read before the Medical Library and Journal Association of New York, by Alfred B. Carroll, M.D., New York. T. Leypoldt, 712 Broadway, 1872.

Report of the Registrar-General of Ontario, for the year 1871.

Transactions of Pharmaceutical Colleges and Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

A pharmaceutical meeting in connection with this college was held on Feb. 20th. Dr. Pile presided, and Mr. McIntyre, in the absence of the Registrar, was appointed secretary, *pro tem.* We are indebted for the following details to the report in the *American Journal of Pharmacy:*

"Professor Parrish exhibited annatto seed from Para, which are said to be used for obtaining a finer tint of color than that which is produced by annatto.

"Professor Maisch exhibited specimens of syrup of senega and syrup of ipecac, prepared by Mr. J. B. Moore from his formulas (published in "American Journal of Pharmacy," March, May and July, 1870), which had been kept for over 16 months: also syrup of orange flowers, prepared of double the strength of the officinal syrup: also, from George W. Kennedy, of Pottsville, Pennsylvania, mistura cretæ, having the sugar replaced by glycerin, and kept for 10 months. Mucilage of gum Arabic was also exhibited by the Professor, made by him in 1870, in which half the water was replaced by glycerin (see Mr. Rother's paper, on page 113 of the present number.) This mucilage had been made for certain investigations which had not been finished.

"Professor Parrish exhibited to the meeting camphor in the state of powder, prepared by Mr. C. H. Heinitsh, last October, by sublimation, as proposed by Mr. Lowd. It was still in a pulverulent condition, and consisted of very minute crystals.

"Professor Proctor presented a specimen of the oil of the liver of the sun fish, prepared by Mr. Marvin (manufacturer of cod-liver oil), at Portsmouth, N. H. This oil has a bright orange-yellow color, an odor differing from cod-liver oil, and was prepared in the same manner as cod-liver oil. Nothing is known of its medicinal properties. This fish is the *Tetraodon mola*, a species of ostracion described in the 10th volume of Cuvier's work (Pisces.)

"Professor Proctor now exhibited some specimens of organic principles, made by Prof. E. S. Wayne, of Cincinnati. These were hydrastin, from *Hydrastis Canadensis;* sulphate of berberina, from the same plant; marrubin, the bitter principle of horehound; phloridzin, from apple tree bark; xanthoxylin, from the bark of *Xanthoxylum fraxineum*, and celastrin, from *Celastrus scandens*. The two last Mr. Wayne claims to have discovered. They are both neutral principles. Xanthoxylin from this plant was described by Dr. Edward Staples in the 1st volume of the "American Journal of Pharmacy," page 163, 1829, which Mr. Wayne has overlooked. The celastrin, which now for the first time is noticed, is in perfectly white crystalline masses of minute crystals like chloral hydrate. We are not aware of its properties or characteristics, but these will be noticed in an article to be prepared by Prof. Wayne.

"Professor Maisch exhibited cinnamic acid and stryacin of various degrees of purity, obtained from liquid storax. Stryacin may be readily obtained in tufts of snow-white needles, by crystallizing it from petroleum benzine. He likewise showed some bibromide of camphor, C_{20} H_{16} O_2 Br_2, discovered by Laurent in 1840, and monobromated camphor, C_{20} H_{15} Br O_2, discovered by Swartz in 1862, and lately recommended by Prof. Deneffe as a sedative for the nervous system. (See Amer. Jour. Pharm. 1872, p. 84). In attempting to make the new therapeutic agent on a somewhat larger scale, an explosion took place while the closed vessel was kept in boiling water, in consequence of the pressure exerted by the confined vapors of hydrobromic acid, uncombined bromine and camphor. Suitable precautions having been taken in anticipation of such a possibility, no injury was sustained. The monobromized camphor resembles Borneo camphor in odor.

"Professor Bridges said it afforded him much pleasure to call the attion of the meeting to a new industry in this country—the manufacture of phosphorus, by Messrs. Rose and Lowell, of Rancocas, Burlington County, New Jersey. The bottle on the table, marked Jan., 1872, is believed to contain the first stick of phosphorus cast in America, and presented a handsome appearance. Dr. Pile remarked that Mr. Rose had informed him in conversation that it was made from spent bone black from the sugar refineries, and pays a profit at the market rates. The manufacturers are already able to supply it in large quantities."

After remarks on the recent investigation in regard to the sale of fraudulent diplomas by certain American Colleges—the Philadelphia University of Medicine and Surgery; the American University of Philadelphia; and the Eclectic Medical College, (Buchanan's), the meeting separated.

PHARMACEUTICAL SOCIETY OF GREAT BRITIAN.

An evening meeting was held on Feb. 7th, Mr. A. F. Haselden, F.L.S., in the chair.

Prof. Attfield called attention to a specimen of cake chloral which had been placed in a half gallon glass jar, and from which had grown out about twenty spear shaped crystals of five or six inches in length. No satisfactory explanation of the phenomenon was given.

A "Note on Tincture of Cinnamon" was communicated by Mr. Greenish, (see next No.) giving rise to the following discussion which is reprinted from the pages of the *Pharmaceutical Journal* and transactions.

The President inquired, in reference to Mr. Greenish's statement that with a strong spirituous preparation the decomposition of tincture of cinnamon would be likely to occur, how it was since the author made the preparation of tincture of cinnamon upon which he based his observations?

Mr. Greenish.—I think quite two years.

The President said that was a considerable time; and if the preparation would keep two years, that was perhaps as long as could be expected. Not only did he agree with Mr. Greenish and Mr. Giles that the different strengths of spirit might be used with advantage for different tinctures, but he also thought that sometimes a different mode of applying the spirit

and preparing the ingredients might be used with advantage. He might mention especially the tincture of calumba. Calumba was one of those roots which was with great difficulty exhausted, and it was also one that absorbed a large amount of the menstruum, of which there was a considerable loss in making the tincture. He had found (and he believed this method was approved by Professor Redwood) that it was better to slice the calumba than to powder it. But still he found that there was a difficulty in slicing it equally, and that with an ordinary root-cutter the substance would break off, and some pieces would be larger and thicker than they ought to be. Hence he had taken a portion of the distilled water which he should have used in making the proof spirit, and placed some of it over the calumba—the whole uncut root—and allowed it to remain for twelve hours. There was just sufficient water to cover the calumba, and the next morning he found that the substance was in a nice condition for slicing with the cutter,—neither too soft nor too hard. He found, also, that when the calumba was in that condition, the loss was considerably less upon the gallon of tincture than it was when either powdered or ordinary sliced calumba was employed. He believed that some process of that kind might be applied to other tinctures. Tincture of orange-peel was one upon which there was a great loss of menstruum; and he believed an improvement might be made in its preparation. He was not prepared at present to state exactly what the improvement should be, but he believed that the liquid might be applied to the orange-peel in a better way. He should be glad to hear remarks on the subject.

Professor Redwood said that he was sure the members were much indebted to Mr. Greenish for bringing forward this subject, and he (Prof. Redwood) should be glad if gentlemen, who, like the President and Mr. Greenish, were constanly and largely engaged in the preparation of this and similar medicines ordered in the Pharmacopœia, would give the Society a little more in detail the result of their experiences and observations. It had struck him (Prof. Redwood) that there were two points in connection with the subject which it was very important to keep separately before the mind. One was the occurrence of decomposition. It seemed to him that all the inferences which had been formed with reference to the tinctures that had just been brought under their notice were inferences founded simply upon the obvious appearances which the tinctures presented to the eye; and in cases in which there had been some alteration or variation in the mode of operating, such as an alteration in the strength of the menstruum or spirit, it seemed to have been inferred, because there was no evidence to our senses of decomposition, that no decomposition had taken place. He thought that that was too violent an assumption. He was not at all clear that in cases where, in consequence of the use of a stronger spirit, there had been no deposition of insoluble matter, there had been no decomposition. The decomposition might have taken place, though the deposit had not been formed. That was a point upon which they required proof one way or the other. It was quite possible that the spirit had held in solution the product of decomposition which, if a weaker spirit had been used, would have given a muddy appearance to the tincture. If that were so, then there naturally arose another question,—Was there in such a case, or would there be, an advantage in the substitution of the stronger spirit for the weaker? He would be inclined to say, No. He would rather continue the use of the weaker spirit, and for this simple reason, that they wanted the tincture to be used in a definite condition. It might be a tincture which would not keep for more than a certain limited period; and if

that were so, it ought to be used within that period, and not used beyond it. If it became muddy when the decomposition took place, that would preclude its use; but if by the use of a different menstruum—a stronger spirit—that muddy character was prevented, then there was an inducement to go on using the tincture when it was in an unfit state. In fact, it appeared to him that the case was somewhat analogous to that of oil of bitter almonds. Oil of bitter almonds in the purified state, freed from hydrocyanic acid, underwent a speedy oxidation. He would not say that this oxidation always occurred, for Dr. Tilden had shown them that if the oil were anhydrous, it might be kept without rapid oxidation; but in its ordinary state, when purified from hydrocyanic acid, it would oxidize quickly, and pass into the state of benzoic acid, which would crystallize in it; and, in place of the fluid oil, there would be a mass of crystals nearly filling the bottle, and they would at once indicate that there had occurred such a change as would preclude the use of the oil, or at least of the altered part of it. If, on the other hand, they had essence of bitter almonds instead of oil,—that is to say, if they had dissolved the oil previously in a certain quantity of spirit,—there was no longer such an indication as that. There would be no deposition of crystalline matter, because there was present a menstruum (the spirit) which, as the benzoic acid formed, dissolved it. That seemed to him to be a somewhat analogous case to what possibly occurred in tincture of cinnamon. It was most desirable that there should be some experiments to indicate whether decomposition took place when external evidences of it were absent.

Mr. Greenish said that cinnamon had absolutely gone out of the two preparations he had mentioned, or scarcely a trace of it was left, and, therefore, in the decomposition the cinnamon was evidently decomposed, and there was a very copious precipitate. When made with the stronger spirit, the compound tincture of cinnamon and the simple tincture had each a strong smell of cinnamon after having been kept for about two years. In every Pharmacopœia which he had consulted on the subject, except that of the United States, a stronger spirit was used—either six of spirit to two of water, or rectified spirit.

The President asked Professor Redwood what method he would propose to be adopted for ascertaining at what time chemical change commenced in tincture of cinnamon, and to what extent?

Professor Redwood said Mr. Greenish had just referred to one evidence which certainly went to show that the tincture made with the strong spirit had retained the cinnamon oil longer than the other, for the flavour of cinnamon still remained. What they would have to look for would undoubtedly be oil cinnamon in the one case, and cinnamic acid in the other. As the oil of cinnamon disappeared, the cinnamic acid would be produced. But it was not easy to judge of the proportion of an essential oil in a strong solution of it, by taste or smell. He had recently had evidence of this in the investigation of a subject allied to that before the meeting, and which he had intended alluding to in connection with the President's paper submitted to them at the previous meeting. One of the subjects referred to in that paper was syrup of tolu; and it was stated that in making that preparation the tolu did not become completely exhausted of the constituents which gave the peculiar character to the syrup. That was a subject of some importance to the pharmacist, and one, moreover, to which he had directed his attention, independently of its being brought forward in the paper. He had been requested to examine a specimen of balsam of tolu for the purpose of ascertaining whether it was genuine or not. He

found clearly that it consisted of the resinous matter of the balsam of tolu answering to the reactions which that resin would give, but it was deficient in some of the most important constituents of good balsam of tolu, namely, cinnamic acid and the peculiar oily matter which gave to balsam of tolu much of its peculiar flavour. He concluded that it was balsam of tolu which had been used for making syrup, or for some similar purpose. In compliance with a suggestion made by Mr. Hanbury, he had used some of this partially exhausted balsam for making syrup of tolu according to the Pharmacopœia, and compared the product with some syrup made with perfectly good and genuine balsam. Now, taking the syrups in the form in which he had produced them, he did not find it very easy to distinguish the one from the other; but if half an ounce of each of those syrups were put into a bottle and diluted with eight or ten times its volume of water, there would be no difficulty in distinguishing between them,—one solution being poor and vapid compared with the other. He should test the tinctures in a somewhat similar way. In examining the balsams, of course he should go to the quantitative determination of the proportions of cinnamic acid in em, as there appeared a probability that exhausted balsam of tolu might find its way into commerce. It was quite clear that something more was required than was at present given in the Pharmacopœia for the purpose of indicating what balsam of tolu ought to be. In the first volume of the Pharmaceutical Journal, Professor Soubeiran, of Paris, reported the results of experiments he had made in consequence of a statement that the same balsam of tolu might be used two or three times for making syrup without any deterioration in the quality of the product. Soubeiran came to the conclusion that, taking account of the proportion of balsam of tolu which was ordered, it could be used twice without deterioration in the product, but not more than twice. The proportion then ordered in the Paris Codex was one part of balsam to four parts of water. It was evident from the experiments of Soubeiran that a smaller proportion would yield a syrup equally good, and the proportion in the Paris Codex has therefore been altered to one part of balsam to ten of water. The proportion prescribed in the British Pharmacopœia is even less, being one to about thirteen, while in Russia the proportion remains at one to four. Having reference to the quality of this syrup, we could neither diminish the proportion of balsam ordered in our Pharmacopœia nor use exhausted balsam without injury to the product. There was a vast difference between syrup of tolu prepared according to the Pharmacopœia, and that which had been occasionally recommended, which was produced by putting tincture of tolu into ordinary syrup. Syrup of tolu, made according to the Pharmacopœia, was one of the most elegant, agreeable and successful of our officinal syrups. It contained a considerable quantity of cinnamic acid, while it derived the flavour of the balsam from the oily and resinous matter. On every ground it was important to maintain the character of that syrup, and in so doing those who made it must take care that they were not imposed upon with exhausted balsam.

The discussion was continued by members present, and at its close the following papers were read: "Note on the Longouge of Mauritius," by Daniel Hanbury, F. R. S. "On the Separation and Quantitative Determination of the Cinchona Alkaloids," by Dr. J. E. De Vry, and "On Samadera Indica," by the same author.

Practical Formulæ.

Jockey Club Bouquet.—

Ess. Iridis (1 lb. to the pint)	.....	5 oz.
" Cassia, " Tuberose, " Ambergris,	.....	*a.a.* 10 drms.
Ol Bergami	.....	½ drm.
" Rosa	.....	1 "
Pure Spirit, 65 o.p	.....	1 pint.

Carbolic Acid for Toilet Use.—

Carbolic acid	.....	10 parts.
Ess. Millefleur	.....	1 part.
Tinct. Quillaya Sapon. (soap bark) (1 bark to 4 alcohol 50 parts water)	.....	1000 "

Imitation Cocoaine.—The *Druggists' Circular* gives the following:—

Cocoanut oil	.....	12 oz.
Castor oil	.....	3 lbs.

Melt the cocoanut oil, add the castor oil, agitate thoroughly, and add

Alcohol, 65 o.p	.....	4 pints.

Waterproofing Linen, Canvas, etc.—The following directions for waterproofing canvas and similar articles for tents, covers, etc., are given by H. Kuhr. The material is taken successively through a bath of sulphate alumina, of soap and of water; it is then dried and smoothed or calendered. For the alumina bath, use the ordinary neutral sulphate of alumina of commerce (concentrated alum cake), dissolving one part in ten of water, which is done easily without the application of heat. The soap is best prepared in this manner: Boil one part of light rosin, one part of soda crystals, and ten of water, till the alum is dissolved; salt the soap out by the addition of one-third part of common salt; dissolve this soap with an equal amount of good palm oil soap in 30 parts of water. The soap-bath should be kept hot while the goods are passing through it. It is best to have three vats alongside of each other, and by a special arrangement to keep the goods down in the baths. Special care should be taken to have the fabric thoroughly soaked in the alumina bath.

In a note to the above, Drs. Hagar and Jacobsen remark that during the last few years very good and cheap waterproof goods of

this description have been manufactured in Berlin, which they believe is effected by steeping them first in a bath of sulphate of alumina and of copper, and then in one of water-glass and rosin soap.

Bottle Wax.—The ingredients are, shellac, 2 lbs.; rosin 4 lbs.; Venice turpentine, 2½ lbs.; red lead, 1½ lb. Melt the shellac and rosin cautiously in a bright copper pan, over a clear charcoal fire. When melted add the turpentine, and lastly, mix in the red lead. Pour into moulds, or form sticks on a warm marble plate. The gloss may be produced by polishing the sticks with a rag until they are cold.

MARKET REPORT.

During the past month trade has been very brisk. The changes are numerous, and nearly all tend to an advance. Stocks are very light, and market rates have to sympathise with the increased values in England.

The articles quoted lower are alcohol, otto rose, oil wintergreen and all descriptions of naval stores.

Heavy chemicals have been in demand, owing to large purchases in Montreal for the New York market. Stocks are now exhausted, and what little may be held will secure high prices, for the balance of the month.

The arrival of spring importations, bought at prices much below present rates, may tend to make prices a little easier.

BUSINESS MEMORANDA.

Mr. E. Chandler, Jr., has purchased the business formerly carried on by Chamberlain & Co., Strathroy.

The business carried on for the last fifteen years by Mr. J. C. Huffman, of Napanee, will, in future, be conducted under the name and style of J. C. Huffman & Son.

Mr. J. F. Holden has opened a drug store at Alton.

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

DRUGS, MEDICINES, &c.—*Contd.*	$ c.		$ c.
Sang Dracon	0 60		0 70
Scammony, powdered	6 50		6 75
" Virg. "	14 50		—
Shellac, Orange	0 50		0 52
Gum, Shellac, liver	0 43		0 45
Storax	0 65		0 75
Tragacanth, flake	1 10		1 40
" common	0 35		0 40
Galls	0 27		0 32
Gelatine, Cox's 6d.	1 10		1 20
Glycerine, common	0 30		0 35
Vienna	0 30		0 40
Prices	0 60		0 75
Honey, Canada, best.	0 15		0 17
Lower Canada	0 14		0 16
Iron, Carb. Precip.	0 20		0 25
" Sacchar.	0 40		0 55
Citrate Ammon.	1 10		1 20
" & Quinine, oz.	0 56		0 60
" & Strychine "	0 17		0 25
Sulphate, pure	0 08		0 10
Iodine, good	14 00		—
Resublimed	16 25		—
Jalapin	1 40		1 60
Kreosote	1 60		1 70
Leaves, Buchu	0 25		0 30
Foxglove	0 25		0 30
Henbane	0 35		0 40
Senna, Alex	0 30		0 60
" E. I.	0 12½		0 20
" Tinnevilly	0 20		0 30
Uva Ursi	0 15		0 15
Lime, Carbolate brl	5 50		—
Chloride	0 05		0 06
Sulphate	0 08		0 12½
Lead, Acetate	0 14		0 15
Leptandrin oz.	0 60		—
Liq. Bismuth	0 50		0 75
Lye, Concentrated	1 75		2 00
Liquorice, Solazzi	0 50		0 55
Cassano	0 23		0 40
Other brands	0 14		0 25
Liquorice, Refined	0 35		0 45
Magnesia, Carb. 1 oz.	0 20		0 25
" 4 oz.	0 17		0 20
Calcined	0 65		0 75
Citrate gran.	0 40		0 50
Mercury	1 00		1 15
Bichlor	1 00		—
Chloride	1 15		—
C. Chalk	0 60		—
Nit. Oxyd	1 20		—
Morphia Acet	3 65		4 00
Mur.	3 65		4 00
Sulph	3 80		4 20
Musk, pure grain oz	21 00		—
Canton	0 90		1 20
Oil, Amonds, sweet	0 50		0 52
" bitter	14 00		15 00
Aniseed	4 25		4 50
Bergamot, super	5 75		6 00
Carraway	4 00		4 20
Cassia	2 20		2 50
Castor, E. I	0 15		0 15
Crystal	0 22		0 25
Italian	0 26		0 28
Citronella	1 10		1 50
Cloves, Ang	1 15		1 30
Cod Liver	1 20		1 50
Croton	2 00		2 10
Juniper Wood	0 80		1 00
Berries	6 00		7 00
Lavand, Ang	16 00		17 60
Exotic	1 40		1 60
Lemon, super	5 75		6 00
ord	2 20		3 40
Orange	4 00		4 25
Origanum	0 65		0 75
Peppermint Ang	13 00		14 40
" Amer.	3 25		3 50
Rose, Virgin	6 50		7 00
" good	5 00		5 50
Sassafras	1 25		1 50
Wintergreen	5 50		6 50
Wormwood, pure	6 00		6 50
Ointment, blue	0 76		0 80
Opium, Turkey	6 50		6 75
pulv	9 00		10 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass.	0 80	0 85
Potash, Bi.chrom	0 25	0 27
Bi-tart	0 30	0 32
Carbonate	0 14	0 20
Chlorate	0 55	0 55
Nitrate	10 50	11 00
Potassium, Bromide	1 60	1 75
Cyanide	0 75	0 80
Iodide	11 75	0 00
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 50	—
Houghton's doz.	8 00	9 00
Morson's oz.	0 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 25
Howard's	2 35	—
" 100 oz. case.	2 35	—
" 25 oz. tin..	2 30	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 25	0 35
Elecampane	0 14	0 17
Gentian	0 10	0 12½
" pulv	0 15	0 20
Hellebore, pulv.	0 17	0 20
Ipecac, "	2 20	2 30
Jalap, Vera Cruz	1 35	1 60
" Tampico	0 90	1 00
Liquorice, select	0 11	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	3 50	—
" E. I.	1 10	2 00
" " pulv	1 40	2 50
" " 2nd	1 30	1 50
" French	0 75	—
Sarsap., Hond	0 40	0 45
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 70	1 80
Spigelia	0 40	0 45
Sal. Epsom	2 25	3 00
Rochelle	0 30	0 35
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 05	0 06
Cardamon	3 50	3 75
Fenugreek, g'd	0 09	0 10
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	2 00	2 50
Spanish	17 00	18 00
Santonine	9 00	10 00
Sago	0 07½	0 09
Silver, Nitrate Cash	14 85	16 50
Soap Castile, mottled	0 10	0 14
Soda Ash	0 04	0 05
Bicarb. Newcastle	6 00	6 25
" Howard's	0 14	0 16
Caustic.	0 05¼	6 00
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 20	2 50
Sulphur. Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 75	0 80
Zinc. Chloride oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Aniline, Magenta, cryst	3 00	4 00
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09	0 10
Camwood	0 06	0 09
Copperas, Green	0 02½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02½	0 04
Indigo, Bengal	2 40	2 50
Madras	0 95	1 10
Extract	0 28	0 35

DYESTUFFS—*Continued.*		
Japonica	0 05½	0 06½
Lacdye, powdered	0 33	0 38
Logwood	0 02	0 03
Logwood, Camp	0 02	0 3½
Extract	0 10	0 14
" 1 lb. bxs.	0 14	—
" ½ lb. "	0 15	—
Madder, best Dutch	0 16	0 17
2nd quality	0 15	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 8½@	0 10
Cassia	0 38	0 40
Cloves	0 12½	0 15
Cayenne	0 18	0 25
Ginger, E. I.	0 12	0 14
Jam	0 20	0 30
Mace	1 45	1 50
Mustard, com	0 20	0 25
Nutmegs	1 05	1 10
Pepper, Black	0 19	0 20
White	0 35	0 36
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 25	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07	0 08
Venetian	0 02½	0 03½
Sienna, B. & G.	0 10	0 15
Umber	0 07	0 10
Vermillion, English	1 20	1 25
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen.	0 08	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
Zinc White, Star	0 10	0 12
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 11	0 12
Putty	0 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 30	—
" No. 1	2 10	—
" No. 2	1 90	—
" No. 3	1 65	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	5 50 @	5 60
Rosin, Strained	5 25	5 25
Clear, pale	9 00	10 00
Spirits Turpentine	1 00	1 05
Tar Wood	5 00	5 25
OILS.		
Cod	0 60 @	0 62
Lard, extra	1 00	—
No. 1	0 95	1 00
No. 2	0 85	0 90
Linseed, Raw	0 79	0 80
Boiled	0 84	0 85
Olive, Common	1 15	1 35
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 60	3 00
Seal Oil, Pale	0 75	0 80
Straw	0 70	0 75
Sesame Salad	1 30	1 35
Sperm, genuine	2 35	2 40
Whale, refined	0 90	0 95

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