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The Application of Spectral Analysis to Pharmacy.*

BY W. W. STODDART, F.G.S., F.C.S.

Perhaps the most startling discoveries of the present day have been those which bear some relation to experimental physics, and more particularly to that branch which treats of optical phenomena.

Not very long ago the supposition of a close relationship between light and chemical action would have been ridiculed, and indeed was so. Now, however, the education of a chemical student must include the fundamental laws and properties of light. The chemist, in his analyses, is constantly invoking the aid of light in some way or other to help him in revealing the hidden secrets of nature. Sometimes the magic touch of a polarized ray will point to each individual granule of starch as it lies hidden by a multitude of other cells; nay, more, it will even tell him the name of the plant from which it was derived; and if this were not enough, the solar rays themselves are actually compelled to reveal to the student their nature and the composition of the sun from which they radiate.

Within the last few years the labours of Kirchhoff, Bunsen, Sorby, and Huggins have been richly rewarded by fresh victories from the study of spectral analysis in chemistry, mineralogy, and astronomy. So much has been said and done lately by scientific observers in this direction, that one's attention is naturally attracted to other materials more intimately connected with every-day life.

It is with the hope of suggesting a practical use of spectral analysis to your notice in a more immediate relation to our own profession, that I venture to introduce my present subject. I do so with diffidence, because I have as yet only just passed the threshold of experiment, but have already seen enough to indicate that a large field of inquiry and interest lies before us. I hope therefore these few remarks may prompt some one present to work out the numerous details necessary for a more complete elucidation of the subject.

Perhaps at the outset the question may arise, "What is spectral analysis?" I will, therefore, ask my more experienced brethren to bear with me while I give a short explanation before describing the method of working and showing some of its results.

Works on the subject are nearly all filled with the phenomena of the spectra of flames. In the beautiful work of Professor Roscoe just published, this is the case; only seven pages are devoted to what is commonly called "the absorption spectrum."

You will all remember that Sir I. Newton, by passing a ray of light through a *circular* opening and then through a glass prism, showed what has been known ever since as "the solar spectrum," the several rays being seperated in order of their refrangibility.

Light may be regarded as an ethereal medium in an intense state of vibration, varying in rapidity from 470 to 800 millions of millions per second. The waves of light, too, as might be expected, vary in size proportionably to the rate of vibration. For instance, a ray of light that gives to the eye an idea of red vibrates, at the rate of 477 millions of millions in every second of time, each wave measuring about the one forty-thousandth of an inch. When the rate of vibration reaches 622 millions of millions, the wave measures only the one fifty-one-thousandth of an inch, and then produces the impression on the retina which we term blue. If the vibration exceeds 727 millions of millions, the eye cannot respond, and unless we use certain precaution, there is no visible colour produced. The vibrations, nevertheless, are there, because the chemical or actinic power is most intense.

Colour, then, is not a substance *per se*, but is a certain impression produced upon the retina, varying according to the intensity of vibration.

The red rays of the spectrum vibrate so weakly that they can only penetrate the thin end of the prism. Those of greater intensity are capable of penetrating the thicker portions of the glass, and are thereby refracted at a greater angle.

It was formerly thought that the three primary and pure colours of the spectrum were red, yellow, and blue, and that neither of these could be further resolved, the intermediate tints being formed by the commixture of different waves of light.

Later discoveries, however, by Professor Maxwell, Helmholtz, and Sir John Herschel seem to prove that the pure colours of the spectrum are *red, green,* and *blue;* that the mixture of yellow and blue cannot in any way be made to produce green, but one of red and green will form yellow.

In the year 1802 the far-sighted Wollaston, instead of passing the beam of light through a circular orifice, made use of a slit one twentieth inch wide, the sides of which were parallel to those of a flint-glass prism. To his astonishment, instead of a continuous band of colours, the spectrum was crossed by six dark lines.

Thirteen years afterwards, M Fraunhofer, of Munich, found that instead of six, he could map out more than six hundred, and discovered the important fact that these lines were always exactly constant, both in number and position, and consequently ever since they have been called "Fraunhofer's lines."

When the light from the sun, planets or fixed stars is observed, these lines appear *black*, but when from the electric spark or an incandescent body, the lines are *bright*, but nevertheless occupy the same position as the dark ones.

These phenomena are now explained by the grand discovery of spectral analysis by Kirchhoff and Bunsen in 1860. They found that when certain metals were burnt in a colourless flame they produced bright lines, which perfectly coincided with certain of the dark ones noticed in the solar rays. For instance, sodium gives a bright yellow line which exactly fits Fraunhofer's line D.

Potassium produces two lines, one coincident with the solar line A. and the other at the commencement of the violet, and so on with the rest of the metals.

The extreme delicacy of spectral testing is almost incredible. It is nearly impossible often to get a flame free from the sodium line, so minutely universal is its distribution. Lithium only a few years since was supposed to be comparatively rare, because the quantity sometimes present was too small to be recognizable by the ordinary tests. Now we find it in almost everything. The spectroscope detects it in the ocean and mineral springs, in felspar and granite, in the ashes of plants and milk of animals, in the ash of a cigar and the juice of a grape.

The object of my present paper is not to explain the bright lines of incandescent bodies, but the appearances of solutions and other liquids when subjected to spectral observations.

When certain solutions are thus observed, they show that part of the transmitted light is absorbed, giving rise to shadow-like bands called "absorption bands."

These bands are constant and give a *spectrum peculiar to each preparation*, as I will presently endeavour to show by exhibiting and explaining the appearances of many of the well known articles of the Pharmacopœia.

Most solutions when greatly diluted are said to be transparent, but this is only comparatively correct. Even air and water deprive the solar light of some of its rays during its passage through these media. The more coloured the solution, the more decided is the effect produced.

Thus an ammoniacal solution of cupric sulphate will transmit the red and violet rays, and absorb all the rest.

An ammoniacal solution of nickel will absorb the violet, but allow the blue and red to pass.

A solution of ferric sulphocyanide will only transmit the yellow and red, while the green, blue, and violet are totally absorbed.

Many substances forming nearly colourless solutions, yet afford very strong absorption bands, *e.g.*, the salts of didymium, manganese, hæmatine, or cruorine.

The absorptive powers of fluid spectra explain the bluish haze of a distant landscape and the green colour of deep water.

The spectroscope used in these experiments is one made by Mr. Ladd, of Beak Street. It is a very excellent instrument, reliable and easily worked. To use it, the eyepiece by itself is inserted into the tube of a microscope, the slit between the lenses opened and the object focussed. The tube containing the prisms is then replaced and the slit gradually closed till a good spectrum is obtained. Should any part of the spectrum not be clear, it must be focussed by means of the milled head attached to the eye lens.

An indispensable addition to the microspectroscope is a small side prism which enables the observer to see the spectra of two solutions at the same time.

Strict attention must be paid to the strength of the solutions under examination. If too strong, too much light will be absorbed, and instead of well marked lines, large, cloudy and obscure bands will be seen.

Mr. Gladstone (Q. J. Chem. Soc. 1079) used wedge-shaped vessels, so that he could examine any thickness of the fluid, for the darker any solution is, the thinner must be the stratum, and the weaker the solution, the deeper the stratum.

I prefer a bit of glass tube, because more generally at hand and easily made. A common 1 oz. or ½ oz. phial will answer well, or, what is still better, the little tube bottles used by the homœopathic chemist. The tubes I usually employ are about $\frac{3}{8}$ths of an inch in diameter.

The solution or tincture is diluted till the spectrum is most advantageously seen. The rate of dilution varies from two to ten times or more. For instance, Tinct. Hyosc. Bienn. would require three or four times its volume of proof spirit, while Tinct. Cannab. Ind. is

*Read before the British Pharmaceutical Conference, August 18th, 1869.

so dense and opaque to light that ten vols. of spirit would be necessary to show its beautiful spectrum to the greatest advantage. As the dilution proceeds, the finest and faintest lines disappear, and afterwards the darkest. A few trials will soon point out the most effective strength to be employed.

The advantage arising from the use of the wedge-shaped cells is now apparent, because by rising or lowering the stage of the microscope, a thicker or thiner stratum of the solution may be viewed.

The constancy of the spectra is very great if only ordinary care and a good spectroscope be used. When a microscopist has once found out the most comfortable and advantageous position of his instrument and illuminating apparatus, he had better always use the same. I always prefer a paraffin lamp mounted on a sliding stand, which I place to the right of my microscope, and have the red end of the spectrum to the left, simply because, from force of habit, it seems to suit my spectroscope better, and by so placing them I can at any time set to work in a few minutes.

Some of the spectra of medicinal preparations, as Tinct. Hyosciami, Tinct. Cannab. Ind., Tinct. Lobeliæ Ætherea, are extremely beautiful, and will vie with any of the mineral salts commonly employed as show objects.

Microspectroscopic observations promise well to detect adulteration and substitution, for hardly ever do the spectra of any two articles appear exactly the same. The smallest discrepancy is immediately seen when the spectra are placed side by side by means of the additional prism.

It cannot be doubted that the use of the microspectroscope is of the greatest assistance in many analytical researches. It must not be expected that every mixture will show separately the several constituents by their individual peculiarities. This is only true in a few instances; cochineal may be at once detected in Tinct. Cardam. Co. and Tinct. Cinchon. Co.

The colouring matter of blood will show its own bands when mixed with cochineal. The spectrum of a tincture made with the leaves of the biennial henbane differs entirely from that of the annual.

It is often the task of the geologist to say whether a clay contains the protoxide or peroxide of iron or both. Spectral analysis will determine the question at once, and point out the protoxide, peroxide, or magnetic oxide.

Another instance is when factitious syrup of violets is sold. The spectroscope will at once tell whether the colouring matter is litmus or red poppy.

Time will not allow me to give more instances of the utility of spectral analysis, but as I before stated, it is a very extensive field for future observation, and a source of great interest and pleasure for many an hour of recreation and instruction.

The following are spectra of many of the Pharmacopœial preparations most generally used.

Inf. Rosæ Co.—Green extended over yellow, blue and violet quite absorbed. When alum is added, the green is totally absorbed, forming a very dark, broad band; part of the blue and all the violet are also absorbed.

Inf. Calumbæ.—Violet and half the blue absorbed.

Inf Rhei.—Violet, blue, and part of the green absorbed.

Tinct. Aloes Barb. (Simp.).—Only the red portion of the spectrum transmitted, all the remainder absorbed.

Tinct. Aloes Socot. (Simp.).—Green, blue and violet absorbed.

Tinct. Aloes Capens (Simp.).—Green, blue and violet absorbed.

Tinct. Arnicæ.—All the violet and a small part only of the blue absorbed.

Tinct. Aurantii.—The green extended over the yellow, while half the blue and all the violet are absorbed.

Tinct. Calumbæ.—Violet, blue and two-thirds of the green absorbed,

Tinct. Cannab. Indic.—A beautiful spectrum showing the dark chlorophyll band strongly at line B. The green extended over yellow, and all the blue and violet absorbed.

Tinct. Cardam. Co.—Violet and blue absorbed. When diluted, the strong cochineal line is visible at E.

Tinct. Cascarillæ.—Violet, blue and one-third of green absorbed.

Tinct. Cinnamomi.—From halfway beyond D to E darkened, all beyond E absorbed.

Tinct. Cocci.—Violet only absorbed, the yellow supplanted by green. Two well marked lines appear, a thin one at D and a broad one at E; a very beautiful spectrum.

Tinct. Digitalis,—Extremely handsome spectrum, exhibiting a magnificent chlorophyll line at B, and a narrow but well-marked line at D. The yellow darkened, blue and violet absorbed.

Tinct. Ferri Perchloridi.—All beyond E abruptly cut off.

Tinct. Hyoscyami (biennial).—The violet and two-thirds the blue absorbed. The green darkened and extended into the yellow. This handsome spectrum is crossed by four very distinct lines. The first a very dark chlorophyll at B. The second just beyond D is narrow. The third is a much stronger one at E. The fourth is a very broad dark band at F at the commencement of the blue.

Tinct. Hyoscyami (annual).—This spectrum is very different to the last, and cannot be mistaken for it. The chlorophyll line at B is not so decided; the second and third lines so weak as to be barely visible, and the fourth absent, Half the green is darkened, part of the blue and all the violet absorbed.

Tinct. Gentianæ Co.—Like that of tinct. aurantii, with the exception that *all* the blue and violet are absorbed.

Tinct Iodi.—Impervious to light, except in a thin stratum. When diluted, the blue and violet are absorbed, and part of green much darkened.

Tinct. Jalapæ.—Last third of green and whole of blue and violet absorbed.

Tinct. Krameriæ.—Yellow and green nearly absorbed, blue and violet quite so.

Tinct. Lavand co.—Yellow shaded by green, and all beyond F intensely absorbed.

Tinct. Lacmi.—A beautiful spectrum. All absorbed beyond G. Two distinct lines; a thick one between D and E and a thin one on E.

Tinct. Lobeliæ.—Green and first half of blue darkened, the remainng blue and violet absorbed.

Tinct. Lobel Æth.—Magnificent spectrum. Very strong chlorophyll line; a fine one at D., and two very strong ones at E and F.

Tinct. Lupuli.—Green darkened; blue and violet absorbed.

Tinct. Nuc. Vom.—Similar to tinct. aurantii.

Tinct. Opii.—Red advanced over yellow, green darkened, blue and violet absorbed.

Tinct. Camph. co.—Voilet absorbed.

Tinct. Quiniæ.—Green extended over yellow blue and violet absorbed.

Tinct. Rhei.—Green contracted and darkened, blue and violet absorbed.

Tinct. Sennæ.—Only red transmitted, the rest being absorbed.

Tinct. Stramonii.—Violet and half the blue absorbed.

Tinct. Sumbul.—Voilet and blue absorbed.

Tinct. Ferri Acetatis.—Green, blue, and violet abruptly cut off by absorption.

Sol. Cupri Ammon. Sulph.—Red and violet only transmitted.

Dec. Aloes Co.—Only red transmitted,. When diluted, three times green, blue and voilet absorbed.

Ext. Belæ liquid.—Green very much darkened. Blue and violet absorbed.

Ext. Cinchonæ flav. liq.—When much diluted, red only transmitted, all the rest being absorbed.

Ext. Cinch. pallid liq.—When much diluted red and orange transmitted, all the rest absorbed.

Liq. Arsenicalis.—Yellow, green, blue, and violet abruptly absorbed.

Liq. Ferri Perchlor.—Blue, green, and violet strongly absorbed.

Liq. Ferri Pernit.—Blue and green and violet strongly absorbed.

Liq. Ferri Persulph.—Green very much darkened, but not entirely, as in the other two iron solutions. Blue and violet entirely absent.

Sol. Potass. Bichrom.—Spectrum only visible to two-thirds the distance between E and F. All the remainder absorbed.

Sol. Pot. Permangan.—Well-known and exquisite spectrum. Five well-marked lines between F and D. The first thinner than the other four.

Syr. Rhœados.—Yellow, green, blue, and violet absorbed, even when much diluted,

Vinum Ferri Citratis.—Extreme end of red at commencement of spectrum green; blue and violet absorbed. Red and orange only transmitted.

Vin. Ferri.—Red and orange only transmitted. It is a peroxide of iron spectrum.

Vin. Ipecac.—Green darkened, blue and violet absorbed.

On a New and Simple Process for Fluid Extracts, by which any Drug may be Exhausted by Percolation, and without Heat.

BY SAMUEL CAMPBELL, OF PHILADELPHIA.*

The subject of fluid extracts is one that has attracted the attention of the most eminent men of our profession, and has called forth numerous essays, elaborate and seemingly unanswerable in their arguments and forms. Graham, Squibb, and Proctor, than whom we have no better authorities at the present time, have each in their turn advanced their views on the subject of percolation and menstruums required to form perfect fluid extracts, and no doubt have given to the medical world a beautiful and substantial theory; and yet if any one will take the time and

* From the American Journal of Pharmacy.

trouble to perform the simple experiments suggested in this paper, he will find that, in following too closely the suggestions of our teachers, we have overlooked the simple and yet, in my opinion, the most important step to percolation, viz., *maceration*. Holding a prominent position in an establishment where all the officinal preparations are prepared largely, I was induced to try and see whether the problem could be solved whereby, in making fluid extracts, heat could be avoided, and whether the great waste or use of alcohol could be dispensed with in their preparation, and, to my satisfaction, I have had no difficulty whatever in thoroughly exhausting any substance of any character with the proper menstrum in the proportion of one pint for every sixteen troy-ounces, by allowing it to macerate for four days in a conical percolator, previous to percolation. The subject is not a hastily formed theory, but is one that is offered as the result of actual experiments with its results and residues open for inspection and consideration. I have taken the liberty to differ from the prescribed menstruum laid down in the Pharmacopœpia, by following out Mr. A. B. Taylor's suggestions on the use of glycerin as a solvent for the various active properties of drugs, and have been surprised at the results obtained from its use; and it is with pleasure that I fully confirm his views regarding its use and adoption by the present revisers of the Pharmacopœia, in the various menstruums. In all the experiments I used Bower's Glycerine. I have adopted as a grade of fineness of powder for percolation, that which is known in the Pharmacopœia as moderately coarse, or which will pass through a sieve of forty meshes to the linear inch, as one within the means of any retail pharmaceutist to powder himself. I find that about five-eighths of the whole quantity can be obtained of this fineness by means of a Swift's drug mill; also, I deem a greater fineness of powder than this as being an unnecessary and unwarrantable waste of time and physical force, since maceration is what is wanted, and not fineness of powder, to make a successful percolation. The common glass funnel I have found to be the best percolator, both in point of convenience and cleanliness, also its conical shape, allowing the proper expansion of the material whilst macerating, previous to percolation. The query has frequently presented itself to my mind as to what is a fluid extract, or what is it supposed to be, or should it represent. If I understand aright, a fluid extract is a concentrated tincture, or solution embodying all the sensible and remedial properties of a drug or drugs, and should represent the drug as it is thrown into the hands of the pharmaceutist from nature, not one or two active principles of the drug alone to be represented, but should approximate as closely as possible in its character and properties to the crude drug itself, in smell, taste, and remedial effects; bearing these points in mind, I undertook the following experiments, with what success the samples will prove. The official fluid extracts are divided into four classes, viz., alcoholic, hydro-alcholic, acetic and saccharine, but by my method will consist of only two classes, viz., alcoholic and hydro-alcoholic. The first or alcoholic, with one-fourth glycerin, and they may be enumerated as follows: buchu, lupuline, valerian, veratrum viride, ginger. The menstruum used in the hydro-alcoholic or second class, composed of one-half alcohol, one-fourth water, one-fourth glycerin; under this head are the following, including the saccharine and acetic fluid extracts cimicifuga, cinchona, colchicum root, colchicum seed, conium, dulcamara, ergot, gentian, hyoscyamus, ipecac, rhubarb, sarsaparilla, sarsaparilla compound, senna, serpentaria, spigelia, taraxacum, uva ursi. The Pharmacopœia directs that a fluid ounce of a fluid extract should faithfully represent one troy ounce of the crude drug, excepting cinchona and wild cherry bark, which are directed to be one-half the above strength, both of which drugs I have prepared of full strength, so that there should be no exception as to the uniform strength of all adopted. In order to prove the accuracy of my method, in exhausting cinchona bark, I took the residue in the percolator after I had obtained sixteen fluid ounces of extract from sixteen troy ounces of the bark, dried it, redampened it, and repacked it in the funnel, and passed six pints of dilute alcohol through it until it came away colorless, then evaporated it to a soft extract which weighed two drachms, of a slightly nauseous taste, but devoid of bitterness, thus proving conclusively the success of my experiment, as to the almost entire exhaustion of the drug of all its active matter. Cinchona bark has been admitted to be one of the most difficult drugs in the whole catalogue to exhaust. In making a fluid extract of wild cherry bark, I used menstruum composed of equal parts of glycerin and water, making it as I said before, ounce for ounce, and it will be found to faithfully represent the bark, having the natural taste and odor in a marked degree.

My method consists in first obtaining a powder, moderately coarse, dampening it with the menstruum, and then packing uniformly in a glass funnel, having previously placed a cork in the end of the funnel, also a piece of sponge in the neck moistened with the liquid; then covering the surface with a disc of paper and pouring on the remainder of menstruum in the proportion of sixteen fluidounces for every sixteen troyounces of drug. Cover over so as to prevent evaporation, and allow to macerate for four days; after that time remove the cork, and use a displacing liquid of either strong alcohol or dilute alcohol, or water, corresponding to the menstruum employed, (omitting the glycerin) by pouring it over the surface of the percolator in order to displace the original menstruum; when sixteen fluidounces for every sixteen troyounces have passed through, it will be finished, and will be found to be perfectly exhausted, thereby avoiding heat, and any large use or waste of alcohol. I find that it requires about an equal measure of the displacing liquid to displace the first or original liquid through.

The difference between my method and that generally employed, consists simply in adopting a uniform grade of fineness of powder for all substances, in long maceration and in the use of glycerin. The officinal method is to reserve the first three-fourths, exhaust and evaporate to one-fourth; in my method I give a long maceration and percolate the quantity at once, thereby avoiding reservation, evaporation, and simplyfying the process very much, and furnish a much better product.

The experiment is worth a trial, and I feel satisfied that if faithfully followed out, will gratify any one with the result, and will enable him to dispense reliable fluid extracts fully representing the crude drug, which in the present time is a great desideratum.

On the Alkaloids Contained in the Wood of the Bebeeru, or Greenheart-Tree (Nectandra Rodiæi, Schomburgk.)*

BY DOUGLAS MACLAGAN, M.D., F.R.S.E.,
Professor of Medical Jurisprudence in the University of Edinburgh;
AND ARTHUR GAMGEE, M.D., F.R.S.E.

In this paper the authors state the preliminary results of their examination of the bases contained in the wood of the greenheart-tree. When the wood is subjected to a process similar to that recommended in the British Pharmacopœia for the preparation of sulphate of bebeerina from the bark of the tree, a mixture of the sulphates of several bases is obtained. The product does not differ in a marked manner from sulphate of bebeerina as it occurs in commerce.

From the mixture of bases the authors separated, by repeated treatment with chloroform, a base which is very soluble in that menstruum. This base, when purified, occurs in the form of a white non-crystalline powder, possessed of an intensely bitter taste It differs from bebeerina in the following particulars:

1st. It fuses when placed in boiling water.

2d. It is much less soluble in ether than bebeerina. 100 parts of pure ether, of density 0·715, dssolve 0 96 parts of beeberina. 100 parts of the same ether dissolve ·04 part of the new base.

3rd. When treated with strong sulphuric acid and binoxide of manganese, a magnificent green color is first developed; this slowly passes into a violet of great beauty, not unlike that produced by the action of the same reagents on strychnine.

4th. The new base has a higher atomic weight than bebeerina. The mean of five determinations of the platinum in the platinum compound of this base showed the percentage of platinum to be 17·72. The mean of four ultimate analyses of the alkaloid gave the following numbers:—

	Calculated.	Found.
Carbon	70·38	70·02
Hydrogen	6·74	6·73
Nitrogen	4·10	4·53
Oxygen	18·78	18·71
	100·00	100·00

To this new alkaloid the author assigns the formula $C_{20}H_{23}O_4N$ (C=12), and the name Nectandra.

The difference between the composition of bebeerina, as ascertained by Von Planta, and that of nectandra, may be seen by comparing thesir formulæ,—

Bebeerina ..... $C_{18}H_{21}O_3N$
Nectandra ..... $C_{20}H_{23}O_4N$

After separating nectandra from the mixed bases obtained from the wood, the authors succeeded in separating a base which is much more soluble in hot and cold water, and which is insoluble in chloroform. It is deposited from a boiling solution in the form of yellow nodules. Its taste is both bitter and astringent. It appears to have a lower molecular weight than either bebeerina or nectandra. The percentage of platinum in the platinum compound was found to be 20·3.

* From the Pharmaceutical Journal, London.

Besides this base, the authors have ascertained the existence of a third, whose characters have, however, not yet been carefully determined.

The authors intended continuing their chemical investigations on these alkaloids, and examining their physiological and therapeutical action. They express their great obligations to the firm of Messrs. Macfarlane & Co., without whose generous aid the material for the investigation could not have been obtained by them.

Lard, and its Preparation for use in Pharmacy.*

BY MR. EDWARD SMITH, TORQUAY.

One of the subjects suggested for investigation by the Pharmaceutical Conference is "The Best Means of Preparing Lard," and this must be my apology for bringing under the notice of the Conference what may be thought a very unimportant, and perhaps uninteresting subject.

The different Pharmacopœias of this country and the Continent have from time to time given very varying instructions with regard to the preparation of lard, some ordering the flare to be first cut up into small pieces, others not be cut at all, some recommending the flare to be first well washed, others ignoring the washing, and so on, with various and differing directions as to straining, etc.

The Austrian and Prussian Pharmacopœias order the flare to be cut into small pieces, then washed, next gently heated until it becomes white and opaque.

The Paris Codex directs the membrane and red pieces to be removed from the flare, cut into pieces, beaten in a marble mortar, and heated in a water-bath until the whole is melted and clear, then strained, and stirred gently until it becomes white and opaque.

The London Pharmacopœia of 1824 directed hog's fat to be melted over a slow fire, and strained through linen.

The Pharmacopœia, 1836, directed the lard of the shops to be washed.

The Pharmacopœia, 1851, gave no instructions for its preparation, but sapiently suggested that salted lard should not be used.

The British Pharmacopœia ordered the fat to be cut into small pieces, and liquefied in a water-bath at 212° F., strained through fine linen, and again heated in the same way, until it became clear, and entirely free from water.

The last (1867) British Pharmacopœia modifies the process of the P. B. 1864, by directing the membranes to be removed as much as possible, the fat cut into small pieces, and broken up with the hands while a current of water is running through it, then as much water as possible drained away, the fat heated to 212° F., and strained through flannel, the residue being pressed while hot, it is then put into a steampan, heated to a little above 212° F., stirring constantly until it becomes clear, and entirely free from water, finally, strain through flannel

The immense difficulty, I might almost say impossibility, of purchasing really good lard capable of being kept a reasonable time without becoming rancid, induced me, some few years ago, to take to making my own lard, and after repeated trials, with more or less success, I find the following plan gives the best and most satisfactory results.

First cut the flare into pieces about the size of a walnut, allow it then to stand for half an hour covered with water, then work it well up with the hands in five or six successive portions of water, next, having drained off as much water as possible, place the whole on a water-bath, and as soon as melted, strain through fine linen. In the first straining it will be impossible to get rid of all the water, so that after cooling, and pouring away the separated water, it is necessary to remelt in a water-bath, and finally, carefully filter through paper in a warm closet.

Now, I do not know how much my plan may differ from those in ordinary use, but the three essential points to be remarked are:

1st. The repeated washings.
2d. The re-melting.
3d. The filtering.

I am not prepared to say if the washings remove any matter in a state of incipient decomposition, but this I do know, that if the washings be omitted, the lard will not keep good so long a time, as with the washings. With regard to the re-melting, the object of this is to get rid of the whole of the water, for if any of this be retained by the lard, it becomes a very fertile source of rancidity. Sometimes I have noticed a number of most beautifully colored mould patches, some scarlet, or blue, pink, green, and indeed nearly a dozen different tints. I prefer this method of removing the water to the P. B. process of heating to 212° F. until it is expelled, simply because it is most important that the temperature applied should be as low as possible, and as lard melts of 100° F., a few degress above this is all that is required. There is no difficulty in removing the last traces of water, inasmuch as the fat being specifically lighter than water, floats on the surface, and when filtering, the last dregs, which contain all the water, should be rejected.

The last and most important point is the filtering. Although straining through fine linen or flannel or felt, may be sufficient, when the consumption of the lard is rapid, and not required for any very especial purposes, yet I cannot too strongly insist that if lard be required of first quality for such purposes as ointments, cold cream, pomades, and so on, it is absolutely essential that it should be filtered through paper, or some body that will effectually remove the numerous particles of membrane and tissue, which are always to be found in imperfectly prepared lard, and which are the main and often sole cause of the rancidity of solid animal fats. This membrane or tissue has an unfortunate tendency to change, to become oxidized, and so set up a decomposing action through the entire mass of fat, resulting in the generation of fatty acids and rancidity, the presence of water materially expedites this decomposition, hence the necessity of re-melting to remove the last particles of water.

By following the process above indicated, I have succeeded in preparing lard, which will keep perfectly sweet and good for many months, even when the jar is constantly opened in the regular course of business, and even after the lapse of a year, the lard has been much sweeter than nine-tenths of that to be had from the best makers, at the best prices.

There is here a specimen of the filtered lard, and also a specimen of filtered lard made from flare in an active state of decomposition, and when in an extremely odorous condition; from which you will see that the process of preparation has nearly eliminated the rancidity, and it is in fact as good as a greater part of the best lards to be met with in commerce.

The germ of success lies in filtration. If we resorted to this much oftener than we usually do, not only as regards lard, but with many ointments and other analogous compounds, we should derive immense satisfaction from the great superiority of the results over mere straining through muslin, flannel or felt.

To strain in these cases is to invite inferiority, to filter is to secure superority if not perfection.

In conclusion, I may say the cost of filtered lard varies from 10*d.* to 1*s* 3*d.* per pound, according to the time of year, but of course the price may be modified in different localities by local circumstances.

* From the Pharmaceutical Journal, London.

On Syrup of Iodide of Iron.

BY M. CARTEIGHE, F. C. S. *

The simple experiments recorded in this paper have been made with the view of clearing up, if possible, the discrepancies contained in communications on the preparation and preservation of this important and elegant medicine contributed to the 9th Volume, N. S., of the 'Pharmaceutical Journal.' The first, page 260, by W. A. Tilden, B. Sc., after alluding to the now obsolete custom of introducing a coil of iron wire, recommends for its preservation the covering of the syrup with a stratum of oil and storing in the *dark*. Mr, F. Baden Benger, page 284, states that he had tried this plan "four or five years ago," but that "it failed to answer its purpose." In what way he does not say. He then mentions as his practice to make a solution of the iodide and add a suitable proportion to simple syrup, as required. Mr. T. B. Groves, page 421, finds that the best method is to add "half a fluid ounce of dilute phosphoric acid to each Pharmacopœia quantity (31 fluid ounces)." I did not hear Mr. Grove's paper read, but I understand that his proposal was considered *highly* improper. Mr. T. H. Holloway, of Sydenham, page 471, writes that syrup exposed in a window for a few hours daily to the direct light of the sun, keeps well, and that *discoloured* syrup may be restored to its normal condition by the same method.

In the discussion which followed the reading of the papers by Mr. Tilden and Mr. Groves, there was considerable difference of opinion as to how long the syrup would keep in the dark without becoming discoloured, but most of the speakers concurred in recommending small *well-filled* bottles and storing in the dark.

Pharmacists had long ago noticed that some discoloured syrups are restored by being heated in bottles in a water-bath for a short time. This observation led me, on the appearance of Mr. Holloway's letter, to try a few experiments based upon it.

Small white bottles, some filled and stoppered, others partly filled and covered with muslin, were exposed to diffused light inside a window, and to direct sunlight out side in a yard. The specimens exposed to diffused

* From the Pharmaceutical Journal, London.

light retained their original colour for a considerable time, and then became gradually bleached. Those exposed to the direct light of the sun retained their colour for a few days, the time depending on the brightness of the weather, and the volume and surface of syrup exposed, and then gradually lost their colour entirely. Several specimens of discoloured syrup, similarly exposed to direct sunlight, were in a few days restored, and when the exposure was continued, became granually colourless. *

There seems to be a limit, however, to this bleaching action. Six fluid ounces of freshly prepared syrup were discoloured by being heated (June 11, 1869) for four hours in an open dish over a water-bath, with occasional stirring, and kept in the dark for a week. A portion has been exposed to direct sunlight without interruption since June 18 without sensible improvement. Another portion was heated in a bottle for twenty-four hours in a water-bath, with the effect of much *increasing* the depth of colour. A little tartaric acid was now added, on the recommendation of M. Jeannel, Pharm. Jour., N. S., Vol. X.; this lessened the colour, but did *not* restore it.

The specimens exhibited comprise:—

No. 1. Specimen of syrup made July 23, 1869, and exposed to diffused light in the open air in a bottle covered with muslin. *A little of the original colour remains.*

No. 2. Made June 28, 1869, and exposed to bright light in a bottle covered with muslin. *Colourless.*

No. 3. Made May 11, 1868, and exposed in shop window ever since. *Colourless.*

No. 4. Made April 3, 1869, discoloured by being kept in dark and afterwards exposed to bright light. *Colourless.*

No. 5. Very discoloured; heated in a water-bath for half an hour, April 30, 1868, and since that date uninterruptedly exposed to bright light. *Colourless.*

No. 6. Made April 3, 1868, and exposed to bright light ever since. *Colourless.*

No. 7. Made June 28, 1869, heated in an open dish for four hours in a water-bath same day, and exposed to bright sunlight since. *Still discoloured.*

No. 8. No. 7 heated in a water-bath till a deep yellowish brown colour was formed, and 3 grains of tartaric acid added and exposed to bright light. *The acid reduced the colour, the light has had no effect.*

Quantities varying from five to thirty fluid ounces have been kept in good condition for months exposed to the light; occasionally a slight brown layer may be seen in the morning on the surface, but it disappears immediately on shaking the bottle.

As to the mode of *preparation*, I consider the Pharmacopœia process unexceptionable It is, however, worthy of note, that if the syrup is heated rapidly to *boiling* before adding the iodide of iron solution, the preparation has less colour than if made at the lowest temperature at which the sugar will dissolve.

The conclusion formed from these experiments is that iodide of iron syrup may be preserved for a long period by exposure in white glass bottles to direct sunlight; the intensity of the light required being directly *proportional* to the volume and surface exposed.

* As Mr. Holloway remarks, in a subsequent letter Messrs. T. and H. Smith appears to have been the first to observe this effect upon discoloured syrup. See Pharm Journ. N. S. Vol. I. p. 353.

Peroxide of Hydrogen.*

BY JOSEPH HIRSH.

While opinions are yet divided as to the stability of the reputation of hydric peroxide as a curative agent, it may not be out of place to mention anything which is an improvement on the process of manufacture or in the quality of this drug, obtained. As such, I will mention the use of phosphoric acid in dilute solution instead of distilled water, as used by Duprey. The peroxide of barium and carbolic acid being used, as suggested by him, after filtration, a solution of oxidized water is obtained, which, by the presence of phosphoric acid, is rendered much more stable than the aqueous or ethereal solution. If this phosphoric solution of oxidized water is kept in the dark (blue glass), and upon ice, its preservation is extended for a great length of time. This may be the more important to druggists, as but few can spare the time and take the pains for a quantitative analysis, which has to be repeated very often with the ordinary solution, to determine its dose, while it constantly decreases in value. Diabetis being also ascribed by some as partly due to the absence of the proper amount of phosphorus in the system, the addition of phosphoric acid can only be an improvement of the preparation.

* From the Pharmacist.

Influence of Oil of Sassafras upon Tobacco.

HUNTSVILLE, ALA., May 15, 1869.

Editor Boston Journal of Chemistry

The interesting article in the May number of the *Journal* reminds me of experiments some years ago, when I was a smoker, I think I can suggest to your readers a more agreable antidote, or denicotizer, than the tannic acid.

A valuable little "Treatise on Fever," by Dezin Thompson, Nashville, Tenn., contains the following statement:

"On one occasion, while waiting upon a tedious case of labor, I amused myself, along with the matrons present, in the enjoyment of the pipe rather freely, and suffered a good deal of vertigo as a consequence. In the course of the conversation which the incident gave rise to, one of the company observed that the dry bark of the sassafras combined with tobacco would prevent its unpleasant effects. On the first opportunity, I made the experiment, and found it true; the sassafras not only preventing the injurious effects of tobacco, but speedily removing them when produced. I tested this repeatedly by smoking in a strong pipe until my head was very disagreeably impressed, and then reloading with a mixture of sassafras bark, a few puffs of which invariably dispelled the unpleasant sensations."

I have again and again, in my own person, verified the statement of Dr. Thompson; but have generally used the oil of sassafras, putting a few drops on the end, and allowing time for its absorption and diffusion through the cigar.

Is there any chemical analogy between oil of sassafras and tannic acid? Or is there any explanation of this identity of effect? Is their action purely chemical and on the nicotine? or is it physiological, and on the nervous tissue?

Indulge me in some other extracts, which appear to me of great practical value, if true, in reference to the anti-narcotic and other powers of the sassafras:

"I added a drop of the oil of sassafras to every two grains of extract of hyoscyamus. Being very susceptible to the influence of nervous stimulants, I began by taking a common sized pill, and increased the dose until I took five at once, without producing any other effect than a most delightful sleep, such as I had not enjoyed since, when a child, I used to fall down under the shade of a tree when at play."

He made for a lady a syrup of butternut, containing sixty grains of hyoscyamus and thirty drops of oil sassafras to the half pint. Her little daughter, in the absence of the family, drank a quantity which "contained at least thirty grains. No injurious effects followed."

He gave to a negro suddenly seized with spasm in his presence, during the prevalence of cholera, a quantity of a like mixture, containing "forty grains of hyoscyamus. In a few minutes the spasm relaxed, and the man assisted all day in burying the dead."

"I had tested its power (oil of sassafras) fully in destroying the poison of insects and reptiles, such as mosquitos, fleas, spiders, bees, wasps, etc.; and, on one occasion, had an opportunity of testing its powers over the vemon of the snake known as the copperhead, and found it succeeded promptly.

The little book from which the above extracts are taken was published ten years ago. I have seen no notice of it by the medical journals. He writes like an accurate and truthful observer and narrator of facts, and it seems to me that the statement in reference to the properties of the sassafras are worthy of being known and tested. Let any one susceptible to the disagreeable influence of nicotine put a few drops of the oil on the end of a cigar, or on the tobacco in a pipe, and he will very soon be convinced that it is a complete antidote.

In making the experiment with the pipe, it is best to cover the oiled portion of the tobacco with some that is dry, or it will not burn so readily; or, if a blaze is used to light it, will burn too rapidly, and prove pungent and disagreeable.

D. SHELBY. M.D.

—*Boston Journal of Chemistry.*

Phosphide of Zinc in Medicine.

M. Vigier and Dr. Curie have recommended the use of phosphide of zinc in cases where the administration of phosphorus is indicated The substance is a gray crystalized body, perfectly definite in composition, unaltered by moist air, and keeping well, either in powder or in pills; but nevertheless easily decomposed in the stomach, and capable of exercising an action on the system identical with that product by phosphorized oil. Phosphide of zinc is selected in preference to the other metallic phosphides, because it is at once perfectly stable, and easily decomposed by weak acids. Even lactic acid attacks it, evolving phosphuretted hydrogen; according to Messrs. Vigier and Currie this explains the action which occurs in the stomach. Phosphide of zinc heated to ebullition, in a current of dry hydrogen.

The authors administer it in a dose of one milligramme (0. 015 gram) several times a day. It is given either in the form of pilules or of powder.—*Medical Press and Circular.*

CANADIAN PHARMACEUTICAL SOCIETY.

PRESIDENT, - - - WM. ELLIOT, ESQ.

The regular meetings of the Society take place on the first Wednesday evening of each month, at the Mechanics' Institute, when, after the transaction of business, there is a paper read, or discussion engaged in, upon subjects of interest and value to the members.

The Society admits as members, Chemists and Druggists of good standing, and their assistants and apprentices, if elected by a majority vote, and on payment of the following fees:

Principals - - - - - $4 00 per Annum
Assistants & Apprentices, 2 00 "

The JOURNAL *is furnished* FREE *to all members.*

Parties wishing to join the Society may send their names for proposal to any of the members of the Society. A copy of the Constitution and By-laws of the Society will be furnished on application.

HENRY J. ROSE, *Secretary.*

THE CANADIAN

Pharmaceutical Journal.

E. B. SHUTTLEWORTH, EDITOR.

TORONTO, ONT., OCTOBER, 1869.

Correspondence and general communications of a character suited to the objects of this JOURNAL, are invited, and will always be welcome. The writer's name should accompany his communication, but not necessarily for publication.

Subscriptions will not be acknowledged by letter, as our sending the paper may be taken as sufficient evidence of the receipt of the money.

All communications connected with the paper to be addressed, post-paid,

"EDITOR CANADIAN PHARMACEUTICAL JOURNAL, TORONTO."

PHARMACEUTICAL LEGISLATION.

We look forward to the coming session of the Ontario Legislature with an anxiety, which, we are well assured is shared not only by every member of the Pharmaceutical Society, but every right minded druggist in the province. The Pharmacy Act, which obtained a first reading at the close of last session, will, in all probability, be again brought before the House, and on the decision then rendered the most important issues depend, affecting alike the welfare of the druggist, the medical profession, and the entire community.

That the present state of things is bad, is a fact apparent to all. Although we have a law to regulate the sales of poisons, it is of little effect, and if ever so rigorously carried out would not cover the required ground. So far as if goes it is well enough, and may serve to throw impediments in the way of the suicide, or poisoner, but these restrictions are of but minor importance when we take into consideration the vast field which is left open to the operations of unqualified and incompetent druggists, whose serious and often fatal blunders recur with an appalling frequency. The injury such persons may effect is beyond estimation, and can never be fully realized, owing to the difficulty of tracing out its source. It is only when consequences ensue, which directly and pointedly indicate the offender, that anything is revealed. These instances do not by any means comprise the majority, as the services of the dispenser are seldom required except in cases of sickness, and then any ill effects which may result from an error in medicine, are generally attributed to other causes. The physician is often puzzled by unusual and unanticipated complications of disease, which, in a great many cases could be traced out to the work of incompetent dispensers,

There is another class of errors which cannot be legally laid at the door of the druggist, but for which we hold he is morally responsible—we allude to errors arising from mistakes of the prescriber. It is not sufficient for the dispenser to be able to read a prescription correctly—though, this we must admit is often a matter of no small difficulty—he should also be able to detect anything unusual, either in the substances ordered, their combination, or doses. Many doctors are lamentably deficient in pharmaceutical knowledge; some are very careless, dashing off a prescription at the bedside of the patient—ten to one, writing with a pencil without a point, and on a crumpled scrap of paper—and with the most utter disregard of laws, chemical or posological. We venture to say that there is not a druggist, or druggist's assistant, in Canada, who cannot record many instances of this,—of mixtures which obstinately resisted all tendency to mix; of pills which could never be rendered pilular; of powders which exploded at the first touch of the pestle. Very perplexing, to say the least of it; but, not so bad as a solution of sulphate of morphia, with the addition of aromatic spirit of ammonia, to correct, as the physician explained, "the druggy effects of the opium," or of the dubious mixture of iodide of potassium and bichloride of mercury, the last dose of which would certainly do the business for syphilis, most effectually; or the delightful tonic of tincture of gentian and chloride of iron, so frequently ordered. We will barely mention "Tinct. Lyttæ; a tablespoonful three times a day," though we can vouch for it; nor shall we refer to the hundreds of instances, of less palpable, though not less dangerous mistakes made by physicians in calculating doses, which the prescription file reveals to us. A druggist should then be able to detect these errors and have them corrected; and if, by reason of ignorance, he suffers them to pass through his hands, and death results; if not amenable to the courts of earth, he will certainly have to answer the charge of his brother's blood at a higher tribunal.

The indiscriminate sale of dangerous medicinal substances by some classes of tradesmen is a practice which cannot be too strongly condemned; nor is the unrestricted sale of poisons by druggists of much less importance. We need not enlarge on this point, as the evil is so flagrant, and its bad effects so often realized, as to render comment unnecessary.

All these things point to adequate qualification on the part of the druggist; but in this country, as well as in others, it has been found that this condition cannot be secured without having resort to legislation. As long as laxity of law permits, there will always be found men ready to turn a dollar, even at the expense of the lives of their fellow-creatures. A desire to rid the profession of these impostors, and thereby to encourage those who really possessed the requisite knowledge, spurred on the druggists of Great Britain, through the continued struggles of many years, which so successfully terminated in the passage of the Pharmacy Act of 1868. Actuated by like motives, and emboldened by the example of their British brethren, the druggists of Ontario seek a similar recognition; and backed up by the good sense and support of the medical profession, and the demands for justice and protection advanced by an injured and suffering public, we have the strongest hopes that by the close of the year the Pharmacy Act of Ontario will be one of the laws of the land.

Pharmacy in Quebec.

We are pleased to see that our eastern friends have not been idle, and that one of the first efforts of the Montreal Chemists' Association is in the direction of pharmaceutical education. A Bill to incorporate the Quebec College of Pharmacy has been drafted by the Council of the Society and has been placed in the hands of Mr. Carter, member for Montreal, who has consented to put it into parliamentary shape. We hope to hear of it during the coming session, and wish the undertaking every possible success. Our friends have got the right view of the question, rightly concluding that if the parent stem is crooked, yet unbending, the younger branches may still be trained into shape.

Proposed Law to Regulate the Practice of Pharmacy in the United States.

Amongst other matters discussed at the Annual Meeting of the American Pharmaceutical Association, that of legislation engaged a large share of attention. A printed

draft of a proposed pharmacy act was handed in by the committee on legislation, appointed last year, and it was resolved by the Association that ten copies of the act should be forwarded to the governors and speakers of the legislatures of the different states, with a view of promoting a uniform law throughout the Union. We append a brief synopsis of the bill:—

Section 1 requires that all shops kept open for the sale and dispensing of medicines and poisons, shall be under the oversight of a registered pharmacist or assistant pharmacist.

Sections 2, 3, and 4 require that no person shall use or exhibit the title of pharmacist or assistant pharmacist unless registered according to law; that no one can register unless a graduate in pharmacy, a practicing pharmacist or assistant pharmacist; that graduates must be from some college of pharmacy in the United States, or from such institution in a foreign country.

Sections 5 and 6 require the appointment of a Pharmaceutical Board by the Governor of each State, and that this board shall examine all candidates for certificates, and cause all prosecutions, and that all members shall pay ten dollars to the board.

Section 8 requires that all registered pharmacists shall furnish their addresses for which a fee is to be paid. All changes are to be duly reported to the board.

Section 9 imposes a penalty for any false representations in the form of registration, by imprisonment from three to twelve months.

Section 10 imposes a fine of fifty dollars for the offence of selling any drugs or medicines unless he be a registered pharmacist, to be paid to the board.

Sections 11 and 12 authorise the fining of any pharmacist for refusing to comply with the regulations of the board. This is not to interfere with the acts of any practicing physician in the line of his profession.

Section 13 imposes a restriction on the sale of any medicines or poisons, unless the name of the same be on the bottle, and the address of the seller. It is the duty of all persons so selling to have the address of the person purchasing, and his name, with a statement of the objects such medicines or poisons are to be used for.

Sections 14, 15, and 16 prohibit the adulteration of any medicines, and requires that all prescriptions shall be kept in a book for five years. For adulteration the fine may be $1,000, and imprisonment may be inflicted.

Pharmacy on the Pacific Coast.

We learn through the columns of the California *Medical Gazette*, that the Druggists of San Francisco have organized themselves into an association to be called the California Pharmaceutical Society. The objects of the society are similar to our own, and if carried out cannot fail to be conducive to the welfare of the profession, as well as the public at large. In speaking of the rules for the admission of members the *Gazette* makes the following sensible remarks:—

If the mere fact of being proprietor of a drug store, entitles the individual to become a member of the society, then the profession and the people at large have no further interest in the California Pharmaceutical Society, other than the earnest hope that many of its members may improve in the science and art of Pharmacy. To establish the regulations between Pharmaceutists, Druggists, Physicians, and the people at large upon just principles, which shall promote the public welfare, it is necessary that only such Druggists shall be admitted as members of the society as are competent men. To be a member of the society should be a guarantee to Physicians and people, that the individual is a qualified and reliable Druggist. Pursue the opposite course, and admit the qualified and unqualified, and many of the better qualified Druggists will keep aloof from the society, while the people will be at as great a loss as before to know who are the qualified Druggists.

Hahnemann Outdone.

A few weeks ago a friend of ours was seized with a sudden attack of dysentery, attended with considerable fever. A homœopathic practitioner was called in, who after mixing up a couple of tumblers-full of "mercurius," and "belladonna," of surprising attenuation, took his departure; feeling somewhat anxious, we called at a late hour in the evening, and found the patient in a state of stupor, which there was no mistaking. An examination of the pupil revealed dilation to an alarming extent. We advised a discontinuance of the medicine, and went home in deep meditation on the marvels of homœopathy. Next morning evident signs of salivation were experienced by the patient and the evening found it thoroughly established. During our visit, next evening, we met the doctor, and on enquiry found that the mercurius had been administered in the form of "our corrosivum," and in the dose of the 1,000,000,000th part of a *grain*; and the belladonna, which was described as a "pharmaceutic tincture," in the same considerable amount. Being a man of peace, and not wishing to reveal our ignorance of the action of these remedies, we avoided discussion by expressing our astonishment; but, although knowing there are heights and depths of therapeutical knowledge to which we have not yet attained, we must confess to having misgivings as to the degree of attenuation in which the medicines were exhibited. It may be that potency of the "pharmaceutic tincture" affected the vision of the worthy doctor, preventing a proper appreciation of quantity; or a slight mercurial tremor may have caused his hand to shake while apportioning the dose of "our corrosivum"; of this we know not, but at all events the effects were realized, and it will be well for writers on the action of these remedies to make a note of it.

Death of Prof. Graham, M. A., D. C. L., F. R. S.

The death of this eminent chemist is reported in the London papers. He was born in Glasgow, in the year 1805; in 1834 he received the Keith prize of the Royal Society, for his discovery of the law of the diffusion of gases, and his talent was again recognized by that body by the award of the Copley medal in 1862. The discovery of dialysis is due to Prof. Graham, as also the recent contributions to science in regard to the supposed metal hydrogenium. He was well known in his official capacity of Master of the Mint, and his *Elements of Chemistry* will serve to perpetuate his memory in the minds of many grateful students.

Classical Lore vs. Practical Knowledge.

A contemporary says that mythologists tell us that Io died because of her intense love for Jupiter; the charm of the romantic story has, however, been completely destroyed by the chemist discovering Io-dide of potassium.

Change of Time of Meeting.

The attention of members of the Society is called to the change in regard to the regular monthly meeting. In future it will be held on the first Friday in the month, instead of the first Wednesday as heretofore.

Owing to an accident to the machinery, this issue is delayed a few days later than usual.

CANADIAN PHARMACEUTICAL SOCIETY.

The regular meeting of the society was held at the usual place on the 6th inst. The Treasurer was called to the Chair—After reading and adoption of minutes, the following gentlemen were proposed and accepted as members:—

PRINCIPALS.

S. Holden..... Markham.
Jno. Urquhart..... Oakville.
Henry Pafford..... Niagara

ASSISTANT.

J. P. May..... Toronto.

An application for membership was referred back to be endorsed by some member, in accordance with the resolution recently adopted.

A communication from Mr. Hart, regarding the publication of the Journal, was read, and the Corresponding-Secretary was instructed to say that the present agreement with the printers would not terminate for some time yet, so that no fresh arrangement could be made.

The Committee appointed at the August Meeting to consider the advisability of holding a reunion of some kind in connection with the Society, reported that under existing circumstances, and taking into account the more serious and weighty matters at present before the Society, it was deemed better to defer the conversazione until the close of the lecture season, when in all probability, from

the possession of an Act of Incorporation, the affairs of the Society will have assumed a more settled shape.

This decision of the Committee seemed rather a disappointment to the members present, and a fresh committee was suggested.

The motion for changing the night of meeting, of which notice had been given, was brought up, and after discussion was adopted unanimously.

The Chairman said that the next subject for the consideration of the Society, was the question of Lectures for the coming season. He said that last Winter the Society had expended some hundred and fifty dollars for the purpose, and out of the many who should have availed themselves of the opportunity, there had only been an average attendance of about ten, or under, and it was for the Society to consider whether such a result justified the continuance of the Lectures. The subject was then freely discussed by the members present, some advocating an arrangement with the Chemistry Lecturers of the University, or Victoria College, for allowing pharmaceutical students to attend. The objection to this course would be that these lectures are held during the day, others thought that the Society was not justified in paying for lectures to which non-residents, who contributed so much to the Society, were unable to attend; in reply to this it was said, that the Committee in organizing the Lectures last Winter, had intended publishing a sort of digest of them in the Journal, but it was found impracticable. The opinion of the meeting seemed to be that by establishing a rigid examination, when the Society becomes incorporated, the junior members would be compelled to educate themselves, and would be more ready to take advantage of means of instruction placed within their reach.

It was moved by Mr. Hodgetts and seconded by Mr. Brydon—

"That in the opinion of this meeting it would not be advisable to establish a course of lectures for the coming season, but that the Lecture Committee be permitted to take such action as may be thought fit to enable intending students to take advantage of any Chemistry Lectures, which may be held."—Carried.

With regard to legislation, the President said that he had heard complaints that a number of unqualified persons were commencing business, in anticipation of the passing of the proposed bill, so as to avoid passing an examination, and although such a practice was much to be regretted, still it would be impossible to have the act made retrospective, as to the examination, the only course being to get the law passed as soon as possible.

Meeting adjourned.

HENRY J. ROSE, Secretary.

BOOK NOTICES.

A MANUAL OF ELEMENTARY CHEMISTRY, THEORETICAL AND PRACTICAL. By GEO. FOWNES, F.R.S. From the tenth corrected and revised English edition. Edited by ROBERT BRIDGES, M.D. H. C Lea, Philadelphia, 1869. pp. 857, 12mo.

This is an American edition of the celebrated text-book of Prof. Fownes, which has stood the test of over twenty years so satisfactorily, and which has always maintained a foremost place in the lists of standard chemical literature. The endeavour to render the work as complete as possible occupied the time of the author until a few hours previous to his death (1849), and the correction of the edition then being published was his daily task. Since that time the book has run through many editions, and until the last few years it has held a place as a text-book in the colleges, almost to the exclusion of others. Many of us can look back with pleasure to the clear, concise, and yet complete manual from which we derived so much instruction.

Latterly, however, the rapid progress of chemical discovery, and the more modern views entertained by the great majority of chemists as to the general principles of chemical philosophy, rendered many additions and alterations necessary. This task was undertaken by Dr. Bence Jones and Henry Watts, men in all respects pre-eminently fitted for the work. The result is the edition before us.

The work is necessarily considerably enlarged, many portions having been entirely re-written, as that on the principles of chemistry, as well as the greater part of that devoted to organic chemistry. The more modern ideas, relating to atomic numbers and the arrangement of atoms, receives a special share of attention, and the new classication of the elements according to their atomicity, is fully discussed and adopted.

The nomenclature of compounds has not been altered to the barbarous extent to which it has been carried by some modern chemists. The word "of" in the names of salts, &c., has been dropped, and the terminations *ous* and *ic*, indicative of a greater or less proportion of the chlorous element, adopted; thus the sulphate and persulphate of iron become, respectively, ferrous and ferric sulphate.

The additions rendered necessary by the manifold discoveries of latter years have been made, and in every respect, we think, that Fownes' Manual may be taken with confidence as representing the true state of chemical knowledge at the present day.

White Wine Vinegar.

Take of acetic acid (No. 8).
Sherry wine—of each, one pint.
Acetic ether, two fluid drachms.
Water, six pints. Mix.—[*Pharmacist.*

Communications.

THE PERCENTAGE SYSTEM.

To the Editor of the Pharmaceutical Journal:

DEAR SIR,—I was very glad to see your remarks on the "percentage system," and had intended writing on the subject myself; now that it has been started I hope it will not be dropped until the grievance is abated. Surely, if the matter were properly represented to medical men, they would agree to cease unjust exactions from unfortunate druggists, of whose necessities they take advantage. Individual druggists cannot make a stand against a system which has attained such a firm foothold—in fact, it is even carried to a greater extent than your correspondent would lead one to suppose. For instance, it has several times happened that medical men have had the effrontery to ask for percentage on occasional prescriptions which reached me; either because they were troublesome or expensive to fill, or because the parties bringing them wanted credit and were not considered very good pay. They also ask for percentage on various things not coming under the head of medicines, which have been required, but which they do not keep in stock, such as wine, arrow-root, sago, and such like. Not long since, a Doctor said he expected me to give him percentage on any such things as above mentioned, saying he had sent me some orders, and that there should now be something coming to him. On my declining to make any arrangement of the kind, he left, and I have never been troubled with orders from him, or custom in any shape.

On another occasion, I was given to understand by a doctor, that he would prefer sending prescriptions to me if I would allow him the same percentage as others; but, on my declining, he went elsewhere, although the druggist he selected knew so little of his business that the doctor had to go behind the counter and show him how to perform the necessary manipulations. The same doctor has frequently walked to the drug store, prescription in hand, lest it should be taken elsewhere; and even when I have sent patients to him, would not allow them to bring me their prescriptions even when they begged for permission to do so.

As soon, however, as druggists are fairly brought into one body by the Pharmaceutical Society, let them make a stand—no one can object to do so, as he would, by objecting, tacitly admit that customers would not voluntarily bring prescriptions to him.

Again, let the Pharmaceutical Society take measures for putting the matter, in a friendly way to the medical men, and I have no doubt the good sense of the majority will carry the day and bring about a reformation without any unpleasant feelings resulting.

Medical men labor under the impression that we are coining money; now, as a general rule, I think this is not the case. We cannot make as much money in a day as others who pursue similar occupations, as for instance, that of a watchmaker who charges 25 cents for putting a glass in your watch—the price of the glasses varying from 1½ to 3 cents—and other portions of the watchwork in like proportion. Now, what would be thought of a druggist if he were to charge similar rates.

Another matter might be represented to medical men, namely: are they much the gainers in keeping and putting up their own

medicines, when they are within reach of a competent druggist? I know of some cases where they are not; where they have to pay a man to attend to their office, or have their prescriptions put up by a boy who does not half understand what he is doing, and sometimes sends out medicines which no druggist would allow to leave his shop. Hoping the importance of the subject will be some apology for this.

I remain, yours truly,

DRUGGIST.

MEAFORD, Sept. 24th, 1869.

MONTREAL CHEMISTS' ASSOCIATION.

The following report of the Council of the above Society was submitted to the Annual meeting held, Sept. 2nd:

"The second year of the Association just concluded, was one of very great interest. The important subject of Pharmaceutical Education, being foremost in the minds of our members, was naturally the first to occupy the attention of the Association. An able address on the subject by Dr. Edwards at our October Meeting, was followed by the appointment of a committee to ascertain if subscriptions could be collected to sustain a course of Lectures on Chemistry and Materia Medica, throughout the Session.

The Committee reported so early as the 12th of the month, that there were seventy-five subscribers. With such incouragement our arrangements were soon made, and a class, averaging from twenty to twenty-five and upwards, met in this room three times a week, from the 1st November to the end of April.

The Council congratulate the Association, on the ability of the two gentlemen who undertook these lectures. It was right that these lectures, should precede our application to the Legislature, for the powers to which we are aspiring. The Bill to incorporate the Quebec College of Pharmacy, as drawn by a Sub-Committee of your Council, is before Mr. Carter, member for the city, who has undertaken to put it into parliamentary shape. His absence from town, is the reason why the printed copies have not been thoroughly circulated. As it stands at present, it can be read to the meeting, if desired

While these kindred subjects had the largest share of our attention, during the past year, there were other matters of interest in our proceedings, to which our Council revert with pleasure.

An invitation having been extended to us, to send delegates to the meeting of the American Pharmaceutical Association, which was held last September in Philadelphia, we were represented there by Mr. Mercer and Dr. Edwards. On their return, these gentlemen spoke in warm terms of the very cordial reception given to them, by the officers and by the association at large. We had another instance of the same friendly feeling, in their presenting us with a copy of their proceedings complete.

Some excellent papers were read by various members at our ordinary meetings, and the success of Mr. S. J. Lyman in treating the subject of Odours, suggested a proposal to repeat his lecture in public, under our aspices, and for the benefit of the Montreal General Hospital. Your Association was thus the means of adding about one hundred and twenty-five dollars to the funds of that Institution.

The resignation of Mr. Gray, who had done as much good service as Honorary Secretary, was universally regretted, more particularly, considering the cause which rendered it necessary. Mr. Reed kindly undertook the duties of the office.

There were ten meetings of the Council during the Session, and of the Association, in addition to the Annual Meeting in September, there were eight ordinary and two special meetings. The difficulty of assembling a sufficient number of members in May and June, has suggested an amendment to the constitution, providing for the termination of our proceedings in April. This amendment will come before you this evening; it has the unanimous support of the Council.

The Treasurer's account will be found on the table, and the Association will no doubt appreciate the labor involved in collecting the subscriptions, and attending to the payment of our numerous petty disbursements. The number of names on the books is at present one hundred and four.

In conclusion, we urge on all our members, the necessity of a sustained interest in the work which is before us. It will be no unworthy result of our labors, if the students of this Association carry off the highest honors, which the forthcoming Quebec College of Pharmacy will have the privilege to confer.

T. D. REED, Hon. Secretary. J. KERRY, President.

Montreal September 2nd 1869.

COUNCIL.

J. Kerry, President; B. Lyman and N. Mercer, Vice-Presidents; W. H. Clare, Treasurer; T. D. Reed, Secretary. J. A. Harte, A. Manson, H. R. Gray, J. B. Edwards, Ph. D., K. Campbell, T. Crathern, E. Muir.

Abstract of Financial Statement.

RECEIPTS.

Balance last year	$125 05
Receipts by Subscriptions and Lecture Tickets	568 00
Interest	5 00
	$698 05

DISBURSEMENTS.

Rent, Gas, and Care of Rooms	$142 84
Printing and Advertising	60 68
Lecturer's Fees	280 00
Furniture	96 30
	$579 82
Balance on hand	118 23
	$698 05

proceeds of Mr. S. J. Lyman's Lecture, handed to the Montreal General Hospital $125 25

W. H CLARE, Treasurer.

RICHARD BOLTON, / Auditors.
RICHMOND SPENCER, (

Medical Science in Japan.

An interesting account of the art and science of medicine amongst the Japanese is given in one of the American journals, by Dr. Vedder, an American physician, and now the chief medical adviser to the Prince of Nagato, The Japanese doctors hold very good positions in society. They originally derived their knowledge from the Chinese, but of late years the diffusion among them of Dutch literature has done much to their enlightenment. There are no schools of medicine in Japan, but the son scrapes together as much information as he may be able from his father, or the native practitioner dispenses his empiricism to the two or three pupils that generally reside with him. An attempt is being made to establish a school at Nagas, aki, in connection with the hospital there-but it is likely to fail from the fact that Dutch is the only foreign language allowed to be used. Physicians carry a couple of swords, and special respect is paid to their opinion, although they are generally paid for medicine alone; and, as may be imagined, the latter is ample and bulky. Sometimes, however, a special honorarium is given to the doctor at the close of the treatment of a case. Very little is known of anatomy. There are native names for veins, nerves, lymphatics, and the principal anatomical structures, but topographical anatomy is entirely unknown, since dissection is not permitted. The Japanese are quite in the dark with regard to physiology. The liver they imagine to be the seat of courage. The doctor feels the pulse at both wrists at the same time, in the belief that there is a heart on either side of the body There are a few works on tumors in Japan, the contents of which have been dictated by fancy or the traditional accounts of disease. Foreign medicines, nevertheless, are in use now-a-days; iodide of potassium, Hoffman's anodyne, quinine, henbane, and phosphoric acid amongst others.—*Dublin Medical Express and Circular.*

Notices from Foreign Sources.

From the Chemical News.

Ink for Writing on Glass.

A solution of fluoride of ammonia is recommended as furnishing a ready means of writing with a pen of any kind upon glass, and is especially adapted for labelling bottles, cylinder-tubes, &c., in the laboratory as well as for making the degrees upon hydrometers and apparatus of similar construction.—*Amer. Artisan.*

Chemical Researches on the Poisonous Principle of the Root of the Cicuta Virosa.

M. Van Ankum.—This principle is an essential oil belonging to the camphine series, and is composed according to the formula $C_{10}H_{18}$; it exhibits rotatory power to the right. The root does not, according to this author, contain any alkaloid at all, either fixed or volatile.—*Les Mondes.*

Mucilage for Labels.

The *Archive of Pharmacy* gives the following recipes: Macerate five parts of good glue in eighteen to twenty parts of water for a day, and to the liquid add nine parts of rock candy and three parts of gum arabic. The mixture can be brushed upon paper while luke warm; it keeps well, does not stick together, and when moistened adheres firmly to bottles.—For the labels of soda or seltzer water bottles, it is well to prepare a paste of good rye flour and glue, to which linseed oil varnish and turpentine have been added in the proportion of half an ounce of each to the pound. Labels prepared in the latter way do not fall off in damp cellars.—*Journal of Applied Chemistry.*

Testing Chloroform for the Presence of Alcohol and Ether.

The chloroform should be first treated with fused chloride of calcium, to eliminate any water, next some iodine should be added. If

the chloroform is free from either alcohol or ether, the color produced by the solution of the iodine is bright red; but when either alcohol or ether are present, the color of the solution is brown. In order to distinguish between alcohol and ether, a small piece of a crystal of fuchsin is added to the chloroform in question; when the slightest trace of alcohol is present, a deep red solution will ensue. Perfectly pure chloroform yields, with fuchsin, a solution which is only slightly pinkish tinged.—*Pharmaceutische Zeitschrift für Russland.*

Preparations of Carbolic Acid and the Carbolates.

Solution Carbolic Acid.

Phenic Acid..... ..... 1 part.
Water .....1000 "

Seldom employed internally. Dose, a spoonful. Injected into the vessels as a disinfectant.

Solution Sulphate Alumina and Carbolic Acid.

Concentrated Sol. Sulphate.
Alumina, 80° Baume .....1000 parts.
Phenic Acid..... 5 "

A caustic disinfectant. A spoonful of this solution in a quart of water constitutes an efficient disinfectant.

Solution Carbolate of Soda. (Baboeuf.)

Phenate of Soda.....10 grammes.
Eau..... ...1 quart.

For arresting hemorrhage and dressing wounds.

Ointment of carbolate of Soda. (Baboeuf.)

Phenate of Soda.....10 grammes.
Lard 100
Mix. In acute and parasitic affections.

Alcoholic Solution Carbolic Acid.

Alcohol, 90°.....1 part.
Crystallized Phenic Acid.1 "

Employed in gangrenous wounds, bites of venemous animals, etc.

Carbolic Acid and Glycerine. (Lemaire).

English Glycerine.....100 parts.
Phenic acid ..... 1 "

Mix. In impetigo, chronic eczema, &c.

The glycerine may be replaced by glycerole of starch.

Carbolic Ether.

Sulphuric Ether..... 100 parts.
Phenic Acid..... 1 "

In Catarrh.

Carbolic Dentifrice Water. (Lemaire.)

Pure Phenic Acid..... 10 parts.
Tincture of Quillay Bark.. 50 "
Essence of Pepperment.... 1 "
Aqua Fort..... 1 quart. M.

A spoonful to be added to a quart of water. The acid destroys the animalcula, and disperses bad odors of the breath. *Journal Chim. Med. May*, 1865.

Carbolic Vinigar.

Acetic Acid (5°)..... .. 800 grammes.
Powdered Camphor..... 5 "
Crystallized Carbolic Acid 100 "

This combination of three antipatrescents is said to be extremely useful, and for hygienic purposes far superior to *the vinegar of four thieves.* It has been used a good deal on board ship, to keep the cabins of sick persons sweet.—*Moniteur Scientific.*

Shoe Soles in Ill-Smelling Feet.

The diffusion of the abominable odor in ill-smelling feet may be effectually prevented by placing a sole containing a layer of powdered charcoal either between the foot and the stocking or between the latter and the shoe. A paste consisting of—

Powdered Charcoal.... 40 parts
Water ..... 40 "
Gum ..... 15 "

should be thickly spread over a piece of filtering-paper, flannel, felt, &c., stretched over a board or pasteboard. The paste is then covered over another piece of paper, which is smoothed over with the hand so as to remove all asperities, When quite dry, the sole may be cut out of the required size. Being cheaply made, they may be changed once or twice a day.—*Stanilas Martin.*

To Purify Vegetable Oil.

A method of purifying vegetable oil, as recently introduced in Paris, consists in allowing sulphuric acid to fall into it in numerous thin streams, and forcing air through at the same time, so that the oil is not only kept in lively motion, but also takes up numerous air bubbles, with which the foreign elements, separated by the acid, from a large mass of scum, which is removed from time to time. The introduction of air is kept up as long as the scum forms and until the oil becomes apparently light and clear. At this stage the oil is still acid. It is then heated in a copper vessel, by steam, for half or three quarters of an hour, to about 212 degrees, and then cool oS to about 70 degrees Fahrenheit and filtered. The oil will become more thoroughly purified in this way then by the common method. The process has been introduced into several establishments in Paris, with excellent results.—*Journal of Chemistry.*

On Sanguinarin, its Properties and Composition.

M. Naschold.—Sanguinarin is so named because it is prepared from the *Sanguinaria Canadensis*, but it also occurs in the *Chelidonium majus* and *Glaucium luteum*; it is an alkaloid, which in pure state is a crystalline, white-coloured solid; formula, $C_{17}H_{15}NO_4$. As a peculiarity, the author observes that the estimation of the nitrogen contained in this substance cannot be satisfactorily excuted with the well-known soda-lime process, but has to be performed by Dumas's method. The author describes, at length, several combinations sanguinarin with the chlorides and cyanides of platinum, its behaviour towards reagents, and its products of decomposition, but none of these are so precisely characteristic as thereby to render it easy to distinguish and detect sanguinarin from all other alkaloids.—*Journal für Praktische Chemie.*

Mineral Lemonade.

When equal parts by weight of strong pure sulphuric acid and strong pure alcohol (85 to 90 per cent) are carefully mixed (the acid being poured into the alcohol and thoroughly mixed therewith), a liquid is obtained which has long been known and used by medical men under the older name of *Elixir acidum halleri*, more recently named *Mixtura sulphurica acida.* This fluid, which, if well prepared, contains essentially sulphovinic acid, is an excellent summer beverage when mixed with water in the proportion of one small teaspoonful to a tumbler of cold water, and sweetened with sugar, or, preferably, with some fruit syrup. Above the lemonades made with vegetable acids, this acid mixture has the advantage of not increasing the perspiration, as citric and other vegetable acids do, while it is better borne by the stomach, and has a tonic action upon the vascular system. It is indeed, a very pleasant drink, often given, at the *cafés* of Paris, Berlin, Vienna, and other places, along with some *syrop de groiselles* or *framboises*, and rather exorbitantly charged for. The proportions by bulk are—one of strong sulphuric acid and three of alcohol.—*Hamm's Agronomische Zeitung.*

On Alkanin.

Professor Boettger states that M. Hirzel, at Leipzig, prepares alkanin, the extract of the alkannet root *anchusa tinctoria*, on the on the large scale,. This extract is dissolved in absolute alcohol; and with this solution strips of Swedish filtering paper are saturated, and made use of, after drying, for detecting even the very faintest traces of ammonia. The alcoholic solution exhibits a beautiful red colour, which, even by the ammonia present in tobacco-smoke, or in illuminating gas, is instantly converted into a beautiful blue. The alcoholic solution and test-paper have, of course, to be kept carefully excluded from all ammoniacal fumes. The red paper may be turned into blue by a very weak aqueous solution of carbonate of soda, and it then becomes an excellent test for even the faintest trace of any acid, turning red therewith at once.—*Dingler's Journal.*

Bleaching Soap.

This is a soda soap prepared according to the excellent prescription of the Prussian Pharmacopœia, which prescription has been copied in almost all other works of the kind; the soap is separated by common salt, and after this one-fourth of its weight of sulphite of soda is added, which has been previously made into a homogeneous paste by means of a little water; the soap is next dried in the usual manner. In order to apply this soap, chiefly intended for the bleaching of straw hats, but perfectly fit for application to silk and wool, it is dissolved in its own weight of cold water, and to every 2 lbs. of soap, ½ oz. of liquid ammonia is added. As soon as the mass has a gelatinous aspect, 1 part thereof is dissoved in 8 parts of warm water. The materials which it is desired to bleach are washed and scrubbed by means of a brush in this soap-sud; while yet moist, the materials are placed in acidulated water (25 parts of water and 1½ of hydrochloric acid), left in this liquid for 2 hours, and then well washed, and rinsed with pure cold water, and dried. This soap is very largely and successfully used in Russia, and was first prepared in that country by Dr. Werner.—*Pharm. Zeitschr. f. Russl.*

Testing Bees'-Wax.

It appears that both yellow and white bees'-wax is met with in the trade largely adulterated with paraffin. In order to detect this, the following process is recommended:—2 grms. of the wax to be experimented upon are placed in a test-tube; and there added a solution consisting of 1·5 grms. of solid caustic potassa in about 5 grms. of distilled water, and the mixture boiled, care being taken to shake the test-tube now and then, whereby a thorough though not quite clear mixture is produced. When the fluid has cooled so far down as nearly to reach the point of solidification of the wax, from 6 to 8 grms. of light oil of petroleum is gradually added, and this thoroughly incorporated with the entire

mass, so as to form an emulsion, from which, if well made, the oil light does not separate. Next, an excess of an aqueous solution of acetate of lead is added, which is mixed with the mass by stirring with a glass rod. The addition of this lead salt causes the separation of the light oil of petroleum, and in it will be dissolved any paraffin present in the wax. The same operation is twice repeated with the contents of the test-tube, that is to say, petroleum is again and again added, and allowed to separate; the separated petroleum is placed into a retort, and the light oil removed by distillation. Pure yellow wax loses, by this process from 14 to 16 per cent; but wax has been met which lost 57 per cent in weight; the specific gravity of the residue of adulterated wax is 0 88. When it is desired to obtain the paraffin in a pure state freed from any dissolved wax, this may be effected by cautiously decomposing the wax supposed to be adulterated with paraffin, by means of fuming sulphuric acid, which does not affect paraffin.—*Chemical News.*

Notes and Queries.

Member.—PURE QUINIA is best prepared from the sulphate; dissolve one part in twenty of water, by means of a little dilute sulphuric acid; precipitate by a solution of caustic soda, added by drops until a clearly alkaline reaction is observed, and a filtered portion is no longer rendered turbid by the precipitant; collect on a filter and wash well with distilled water, dry by a gentle heat. By this means 10 parts of sulphate of quinine (if pure) yield 7 parts of the alkaloid. It is commonly recommended to precipitate by ammonia; neither this alkali, or potash, are as good as soda, as quinia is soluble, to a small extent, in both. If they are used, care must be observed not to add a large excess, or the yield will be diminished.

Photographer.—PURITY OF NITRATE OF SILVER.—The chief impurities are the nitrates of potash, soda, lead, and copper. The two former, and, perhaps, the third, may be regarded as adulterants, intentionally added to increase the weight; the last—copper—is derived from impure silver, and denotes want of care or skill in the manufacture of the nitrate. Occasionally the copper may be found as oxide. Where the purification of the nitrate has been effected by fusion, this is liable to be the case. Another impurity which results from this cause, is the *nitrite* of silver, a salt very injurious to successful photography; sulphate and chloride of silver may also be present, from the use of impure nitric acid. The purity of the salt cannot be determined by one operation, but a rough approximation may be made by dissolving a given weight of silver in distilled water and precipitating with chloride of sodium or hydrochloric acid, not in great excess; washing, drying, and weighing the precipitate, which may be taken as equal to three-fourths silver; 170 parts of the nitrate should give 108 parts silver, or 143·5 parts of chloride. *Copper* may be detected by adding ammonia to the nitrate, in solution; a blue color is developed. *Lead*—A dilute solution gives a precipitate with sulphate of soda. *Potash and Soda*—Evaporate the clear solution, after precipitating the silver as chloride; nitrate of soda or potash will appear in the residue, which, if dried, may be weighed. *Nitrite, sulphate or chloride of silver* are left behind after dissolving the salt in an equal weight of cold water; the two former as very small gritty crystals, the chloride as a soft white, or dirty white powder.

J. E. S.—COLORING FOR ESSENCES AND OILS.—For Lemon, curcuma is generally employed. Peppermint, santalum, or curcuma, or a mixture of both; a tincture of the leaves of the herb is, however, best and most appropriate. In the absence of this, a coloring made by macerating common grass, slightly bruised, in alcohol, answers a good purpose; the leaves of parsley are sometimes used in this manner. For Cinnamon, use santalum; for Cloves, the same, or, preferably, caramel, which imparts a browner color. Raspberry and Strawberry: tincture of cudbear, or magenta. Pineapple and Pear; curcuma. A yellow color, resembling that of olive oil, is sometimes given to a mixture of castor oil and spirit, by an alcoholic tincture of annatto. Rose hair oil is made with a solution, in oil, of the coloring matter of anchusa. This is much to be preferred to magenta, which is sometimes used, as the latter color is liable to attach itself to the hands.

Specific Gravity, Montreal.—"What is the density of absolute ether?" The density of sulphuric ether is variously stated; as a rule the later the authority the lower the specific gravity given. Lavoisier, in his *Elements of Chemistry*, 1790, gives it at ·7394; Watts' Dictionary at ·723 at 12·5° C., which nearly coincides with that in the last edition of Fownes' *Chemistry*—·720 at 15·5° C. (60° F.) The United States *Dispensatory* places it at ·713, but on what authority we cannot state. The figure ·720 may be assumed most correct, Although ether is amongst the lightest of liquids, its vapor is extremely heavy, being about two and a half times denser than air.

Changes.

Dr. Alway has opened a new business at Smithville, to be carried on under the management of J. H. Hewson.

Alfred Major, Halifax, N. S., has made an assignment of his stock.

H. A. Wilson, Paisley, assigned.

J. R. Stewart, Southampton, has recommenced business.

Trade Report.

We are happy to be able to say that business during the past month has been very much better than for some time past.

There are a number of changes, which we enumerate below, and which are principally in favor of the buyer.

Drugs.—Opium has fallen considerably, and the present price cannot be called a very unreasonable one. Cardamon seeds are also very much lower, the best Malabar having fallen one dollar per lb. Quinine remains firm. In Essential Oils it will be noticed that Super. Bergamot, Eng. Lavender and Sassafras are very much lower, those goods which are against the purchaser are Vanilla and Cantharides, which are considerably advanced, and reported as likely to be still higher. We report Carb. Ammonia unchanged in price but in very large demand, and very short supply.

Spices.—The demand for Mace has been greater than we have ever known, and it has consequently run up the price.

In Naval Stores we report Spts. Turpentine a little advanced and held very firm.

In Oils we have no material change to note, except in Seal Oils, which are slightly advanced and held very firm. Linseed Oils are in large demand and low in price.

NOTE.—The notes quoted in our price list are constantly varying, and are intended to show the limits within which a retail druggist should supply himself. The range of prices is caused by the difference between cash and credit, whole packages and smaller lots, and, in some cases, difference of quality.

WHOLESALE PRICES CURRENT.—OCT., 1869.

Drugs, Medicines, &c.	$ c.		$ c.
Acid, Acetic, fort	0 12	@	0 15
" Benzoic, pure	0 28		0 35
" Citric	0 83		0 90
" Muriatic	0 05		0 07
" Nitric	0 11½		0 15
" Oxalic do.	0 26		0 32
" Sulphuric	0 04½		0 07
" Tartaric, pulv.	0 36		0 45
Ammon., carb. casks	0 17		0 19
" " jars	0 18		0 20
" Liquor, 880	0 18		0 25
" Muriate	0 12½		0 15
" Nitrate	0 45		0 60
Æther, Acetic	0 45		0 50
" Nitrous	0 22½		0 25
" Sulphuric	0 48		0 55
Antim. Crude, pulv	0 10		0 12
" Tart. "	0 50		0 60
Alcohol, 95%	1 72½		2 00
Arrowroot, Jamaica	0 21		0 22
" Bermuda	0 45		0 65
Alum	0 02½		0 03½
Balsam, Canada	0 32		0 40
" Copaiba	0 75		0 80
" Peru	2 90		3 00
" Tolu	1 20		1 40
Bark, Bayberry, pulv.	0 20		0 25
" Canella, "	0 17		0 20
" Peruvian, yel. pulv	0 42		0 45
" " red "	1 50		1 60
" Slippery Elm, g. b.	0 18		0 20
" " flour, pkt's	0 28		0 32
" Sassafras	0 15		0 18
Berries, Cubebs, ground	0 30		0 40
" Juniper	0 06		0 10
Beans, Tonquin	0 60		1 10
" Vanilla	8 50		9 00
Bismuth, Alb.	6 00		6 40
" Carb.	6 00		6 40
Camphor, Crude	0 48		0 48
" Refined	0 60		0 68
Cantharides	0 90		1 00
" Powdered	1 00		1 10
Charcoal, Animal	0 04		0 06
" Wood, pow'd.	0 12		0 15
Chiretta	0 55		0 65
Chloroform	1 35		1 50
Cochineal, S. G	0 90		1 15
" Black	1 30		1 75
Colocynth, Pulv.	0 50		0 80
Collodion	0 55		0 60
Elaterium oz.	4 50		5 00
Ergot	1 08		1 15
Extract, Belladonna	2 00		2 20
" Colocynth, Co.	1 25		1 75
" Gentian	0 50		0 60
" Hemlock, Ang.	1 12		1 25
" Henbane, "	2 40		2 60
" Jalap	5 00		5 50
" Mandrake	1 75		2 00
" Nux Vomic. oz	0 60		0 70
" Opium "	Variable.		
" 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 26		0 35
" Chamomile	0 36		0 45
Gum, Aloes, Barb. extra	1 00		1 10
" " good	0 50		0 55
" " Cape	0 15		0 20
" " pow'd	0 25		0 30
" " Socot	0 80		0 90
" " pulv.	0 90		1 00
" Arabic, white	0 60		0 65
" " pow'd	0 57		0 65
" " sorts	0 34		0 37
" " pow'd	0 50		0 60
" " com. Gedda	0 13		0 16
" Assafœtida	0 35		0 40
" British or Dextrine	0 13		0 15
" Benzoin	0 48		0 55
" Catechu	0 15		0 20
" " pow'd	0 25		0 30
" Euphorb, pulv	0 32		0 40
" Gamboge	1 40		1 60
" Guaiacum	0 32		0 50
" Myrrh	0 48		0 60
" Sang Dracon	0 60		0 70
" Scammony, pow'd	5 60		—
" " Virg. "	14 50		—
" Shellac, Orange	29		0 32

Drugs, Medicines, &c. *Continued.*	$ c.		$ c.
Gum, Shellac, liver	0 24	@	0 28
" Storax	0 65		0 75
" Tragacanth, flake.	0 70		1 40
" " common	0 30		0 35
Galls	0 32		0 37
Gelatine, Cox's, 6d.	1 10		1 20
Glycerine, com.	0 25		0 30
" Vienna	0 35		0 40
" Price's	0 65		0 75
Honey, Canada, best	0 16		0 20
" Lower Canada	0 12½		0 13
Iron, Carb. Precip.	0 20		0 25
" " Sacchar	0 40		0 45
" Citrate Ammon.	0 90		1 00
" " & Quinine oz.	0 43		0 48
" " & Strychnine"	0 17		0 25
" Sulphate, pure	0 08		0 10
Iodine, good	4 50		5 00
" Resublimed	5 60		6 00
Jalapin oz.	1 50		2 00
Kreosote	1 60		2 50
Leaves, Buchu	0 30		0 50
" 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 20
Lime, Carbolate brl.	5 50		—
" Chloride	0 04½		0 06
" Sulphate	0 08		0 12½
Lint, Taylor's best	1 12½		1 25
Lead, Acetate	0 14		0 17
Leptandrin oz.	0 60		—
Liq. Bismuthi	0 50		0 75
" Opii, Battley's	7 60		9 00
Lye, Concentrated	1 50		2 00
Liquorice, Solazzi	0 37		0 45
" Cassano	0 30		0 40
" Other brands	0 14		0 25
Liquorice, Refined	0 35	@	0 45
" " Hessin's doz	2 00		
Magnesia, Carb 1 oz.	0 20		0 25
" " 4 "	0 17		0 20
" Calcined	0 65		0 75
" Citrate gran.	0 40		0 50
Mercury	0 65		0 75
" Bichlor	0 70		0 80
" Biniodid oz.	0 25		0 35
" Chloride	0 90		1 00
" C. Chalk	0 45		0 60
" Nit. Oxyd	0 90		1 00
Morphia, Acet. } about	7 40		—
" Mur. } about	7 60		—
" Sulph. }	—		—
Musk, Pure grain oz.	21 00		-
" Canton	1 00		1 20
Oil, Almonds, sweet	0 48		0 55
" " bitter	14 00		15 00
" Anniseed	4 00		4 50
" Bergamot, super.	6 50		7 00
" Carraway	4 00		4 20
" Cassia	3 00		3 20
" Castor, E. I.	0 16		0 20
" " Crystal	0 22		0 25
" " Italian	0 26		0 28
" Citronella	1 50		1 75
" Cloves, Ang	1 00		1 10
" Cod Liver	1 40		1 50
" Croton	2 50		3 00
" Geranium, pure, oz.	2 00		2 20
" Juniper Wood	0 90		1 00
" Berries	6 00		7 00
" Lavand, Ang	21 50		22 00
" " Exot	1 40		1 60
" Lemon, super.	3 30		3 60
" " onl.	2 70		2 80
" Orange	3 00		3 20
" Origanum	0 65		0 75
" Peppermint, Ang	15 00		17 00
" " Amer	5 00		5 50
" Rose, virgin	7 75		8 00
" " good	4 40		5 50
" Sassafras	1 30		1 40
" Wintergreen	4 90		5 50
" Wormwood, pure	5 80		50
Ointment, blue	0 65		0 70
Opium, Turkey, about	11 00		—
" " pulv	13 40		—
Orange Peel, opt.	0 65		0 75
" " good	0 12½		0 20
Pill, Blue, Mass	0 70		0 75

Drugs, Medicines, &c. *Continued.*	$ c.		$ c.
Potash, Bi-chrom	0 15	@	0 20
" Bi-tart	0 25		0 28
" Carbonate	0 16		0 20
" Chlorate	0 40		0 45
" Nitrate	8 50		9 00
Potassium, Bromide	1 80		2 00
" Cyanide	0 70		0 75
" Iodide	3 80		4 50
" Sulphuret	0 25		0 35
Pepsin, Boudault's oz.	1 65		1 80
" Houghton's, doz	8 00		9 00
" Morson's oz.	0 82		1 10
Phosphorus	0 75		0 85
Podophyllin	0 50		0 60
Quinine, Pelletier's	1 67½		—
" Howard's	1 72½		1 80
" " 100 oz. case	1 60		—
" " 25 oz. tin	1 60		—
Root, Colomba	0 14		0 20
" Curcuma, grd.	0 12½		0 17
" Dandelion,	0 25		0 35
" Elecampane	0 14		0 17
" Gentian	0 08		0 12½
" pulv.	0 15		0 20
" Hellebore, pulv	0 18		0 25
" Ipecaac "	2 40		2 60
" Jalap, Vera Cruz	1 55		2 —
" Tampico	0 90		1 —
" Liquorice, select	0 13		0 17
" pow'd	0 12½		0 16
" Mandrake, "	0 20		0 25
" Orris "	0 20		0 25
" Rhubarb, Turky	4 40		5 50
" E. I., China	1 40		1 75
" " " pulv.	1 50		1 85
" " " 2nd	1 30		1 50
" French	0 75		—
" Sarsap., Hond	0 45		0 50
" Jam.	0 75		0 80
" Squills	0 10		0 15½
" Senega	0 40		0 50
" Spigelia	0 35		0 40
Sal., Epsom	3 00		4 00
" Rochelle	0 28		0 35
" Soda	0 02		0 03
Seed, Anise	0 16		0 30
" Canary	0 05½		0 07
" Cardamon	3 00		4 00
" Fenugreek, grd	0 10		0 15
" Hemp	0 06		0 07
" Mustard, white	0 14		0 16
Saffron, Amer.	1 25		1 50
" Spanish	14 00		16 00
Santonine	10 50		12 00
Sago	0 07¼		0 09
Silver, Nitrate, cash	14 90		16 50
Soap, Castile, mottled	0 12½		0 14
Soda Ash	0 03		0 04
" Bicarb. Newcastle	4 00		5 00
" " Howard's	0 14		0 16
" Caustic	0 04		0 05
Spirits Ammon., arom	0 25		0 35
Strychnine, Crystals	2 30		2 75
Sulphur, Precip.	0 10		0 12½
" Sublimed	0 4		0 05
" Roll	0 03		0 04½
Tamarinds	0 15		0 20
Tapioca	0 20		0 23
Veratria oz.	0 25		0 30
Vinegar, Wine, pure	0 55		0 60
Verdigris,	0 35		0 40
" Pow'd	0 45		0 50
Wax, White, pure	0 85		0 90
Zinc, Chloride oz.	0 20		0 25
" Sulphate, pure	0 10		0 15
" " com	0 06		0 10

Dyestuffs	$ c.		$ c.
Annatto	0 40	@	0 60
Analine, Magenta, cryst	Variable.		
" " liquid	2 50		—
Argols, ground	0 15		0 25
Blue Vitriol, pure	0 08		0 10
Camwood, pure	0 06½		0 09
Copperas, green	0 01½		0 02½
Cudbear	0 16		0 25
Fustic, Cuban	0 03		0 04
Indigo, Bengal	2 40		2 50
" Madras	1 15		1 20
" Extract	0 28		0 35
Japonica	0 05½		0 06½
Lacdye, pow'd	0 35		0 40
Logwood	0 02½		0 03

Dyestuffs *Continued*	$ c.		$ c.
Logwood, Camp	0 02½	@	03½
" Extract	0 13½		14
" " 1lb bxs	0 15		—
" " ½lb "	0 16		--
Madder, best Dutch	0 16		0 18
" 2nd quality	0 14		0 15
Quercitron	0 03		0 05
Sumac	0 06½		0 08
Tin, Muriate	0 10½		0 12½
Redwood	0 05		0 06

Spices.			
Allspice	0 08½	@	0 10
Cassia	0 50		0 55
Cloves	0 15		0 16
Cayenne	0 18		0 25
Ginger, E. I.	0 12		0 14
" Jam	0 28		0 30
Mace	0 78		0 90
Mustard, com	0 20		0 25
" D. S	0 40		0 45
Nutmegs	0 45		0 75
Pepper, Black	0 11½		0 12½
" White	0 20		0 22

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
" Red	0 08		0 10
Green, Brunswick	0 07		0 10
" Chrome	0 20		0 25
" Paris	0 30		0 35
" Magnesia	0 20		0 25
Litharge	0 08		0 09
Pink, Rose	0 12½		0 15
Red Lead	0 06½		0 08
" Venetian	0 02½		0 03½
Sienna, B. & G.	0 10		0 15
Umber, "	0 07		0 10
Vermillion, English	0 90		1 00
" American	0 25		0 35
Whiting	0 85		1 25
White Lead, dry, gen.	0 07½		0 09
" " " No. 1	0 06½		0 08
" " " No. 2	0 05½		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 32		0 37½
Red, Venetian	0 07		0 10
Patent Dryers, 1lb tins	0 14½		0 16
Putty	0 03½		0 04½
Yellow Ochre	0 08		0 12
White Lead, gen. 25lb tins	2 35		—
" " 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	4 50	@	5 50
Rosin, Strained	3 75		4 50
" Clear, pale	6 50		10 00
Spirits Turpentine	0 48		0 55
Tar Wood	4 00		5 00

Oils.			
Cod	0 65	@	0 70
Lard, extra	1 25		—
" No. 1	1 12½		—
" No. 2	1 00		—
Linseed, Raw	0 75		0 80
" Boiled	0 80		0 85
Olive, Common	1 25		—
" Salad	1 80		2 30
" " Pints, cases	4 20		4 40
" " Quarts	3 60		3 00
Seal Oil, Pale	0 80		0 85
" " Straw	0 75		0 80
Sesame Salad	1 30		1 35
Sperm, genuine	2 40		—
Whale, refined	0 85		1 00