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Original and Selected Papers.

BUCHU LEAVES.*

BY PROFESSOR F. A. FLUCKIGER.

The leaves of species of *Barosma* growing at the Cape, known under the name of buchu leaves, are but little used, and have not yet been the objects of a chemical or microscopical investigation, although worthy in a high degree of both. The smell of buchu leaves appears to the author not alone to depend upon the essential oil, for in this respect it is more suggestive of peppermint. By long exposure to the cold of winter he has obtained from the oil a well crystallized camphor which melts at 85° C. and commences to sublime at 110° C. It dissolves in bisulphide of carbon, from which it may be obtained in fine needles that might well be taken for peppermint stearoptine. The elementary analysis gave, carbon 74·07, and hydrogen 9 to 10, but it was not sufficiently satisfactory to construct a formula from. The oil poured off from the camphor of *Barosma betulina* does not boil under 200° C., and after being rectified over soda, answers to the formula $C_{10}H_{16}O$. The crude oil turns the plane of polarization to the left.

* Abstract of an article in the *Schweizerische Wochenschrift fur Pharmacie*, Dec. 19, 1873, published in the *Pharm. Jour. and Trans.*

The aqueous infusion of the leaves contains some mucilage, and a body which belongs probably to the quercitrin or rutin class; the extract is not altered by ferrous salts; it is coloured greenish brown by ferric chloride, and gives with acetate of copper a yellow precipitate which is soluble in potash. Further experiments are required to show what this body is.

In an anatomical point of view buchu leaves appear at first sight remarkable by the large sperical oil vessels, which however do not claim any especial interest. If a transverse section of a *Barosma betulina* leaf be made, three layers can be discerned in the inner tissue. The thickest, occupying the middle of the leaf, is coloured green by chlorophyll, which is much less the case with the considerably smaller layer occupying the space between the chlorophyll layer and the under side of the leaf. A third layer, in a section prepared in alcohol or oil, is scarcely perceptible. It appears as a small uncoloured zone directly under the epidermis of the upper side of the leaf, in which, differing from the under side, no oil vessels appear. There may be seen also the filbrovascular tissue, the raphides, the cuticle and the epidermis constituting the skin tissue of the leaf.

If a section of *Barosma* leaf be placed in glycerine the epidermis of the upper side is raised by a mechanical action which resembles that which takes place when the epidermis of linseed, white mustard seed, quince seed, etc., is saturated with water. The delicate walls of the colourless cells in the last mentioned layer swell up, and protruding perpendicularly to the surface of the leaf, let a thick slime run out, in which the cell walls gradually disappear. At first there seems in this cellular slime an appearance of delicate stratification as in many other similar cases. The mucilage is not coloured by iodine, consequently it may be considered to approach nearer to cellulose. Under the influence of glycerine the mucilaginous layer of the leaves of *Barosma betulina* assumes the development described quite gradually; but it is produced much more quickly when the leaves are placed under water. In the latter case this layer occupies fully half the breadth of the section.

The leaves of the *Barosma crenulata* and *B. serratifolia* are, as is known, much thinner, being about half as thick as those of *B. betulina*. When these thinner leaves are placed in alcohol the mucilaginous layer remains scarcely perceptible, but in water it swells equally with that of the other kind. The breadth of this layer is then proyortionately much more considerable in the thinner species, taking up two-thirds the breadth of the section of a leaf.

Whilst we are accustomed to find the epidermis to be the seat of the mucilaginous formation in the seeds, and to meet with special mucilage cells in the cortex, in the buchu leaf this function belongs to a row of cells (collenchyma) in the interior, without the epidermis having any share in it, if we, at least, leave out of consideration the

fact that here and there isolated prolongations of cells extend from the epidermis into the mucilaginous layer.

The author does not know whether other leaves present similar conditions; In *Althœa* leaves, after quite a cursory examination, this appeared to him to be no more the case than in those of *Sesamum indicum*, which are tolerably mucilaginous. *Empleurum serrulatum*, on the other hand, resembles *Barosma*.

CROTON CHLORAL.*

BY ALFRED H. MASON, F.C.S.

A new remedy, with chloral as its basis, and introduced by the discoverer of the therapeutical application of hydrate of chloral, naturally commands attention. At one of our general meetings in 1872 session I exhibited a specimen of this, then new, compound, named by Professor Liebreich croton chloral hydrate.

Within the last few months this medicine has commanded much more of the attention of medical men, so that the requirements of it somewhat exceed the first demand for its predecessor when sold at about the same price.

Crotonic chloral was discovered somewhat accidentally by Dr. G. Kraemer and Dr. A. Pinner.† These gentlemen were undertaking experiments on the action of chlorine on aldehyde, chiefly in the hope of thus obtaining chloral, and of being able to utilise the valueless residue from the first runnings obtained in the distillation of crude spirit, which consists mainly of alcohol, aldehyde, and paraldehyde.

Chlorine was passed into aldehyde, at first carefully cooled in a freezing mixture, and only heated to 100° at the close of the reaction. The first few bubbles caused the separation of a small quantity of solid met-aldehyde, whether originally present in the aldehyde, or formed by the reaction, is undecided. After a short time evolution of hydrochloric acid set in, and every trace of chlorine was absorbed. With 100 grains of aldehyde, at the end of 24 hours, no further absorption took place even at 100°. The resulting brown mass consists of two layers: a lower, darker, almost solid; and an upper, lighter coloured, liquid layer. The latter is a saturated solution of hydrochloric acid and the bodies of the lower layer in water. As it was found impossible to separate these two well, the whole was submitted to distillation. A considerable quantity passed over

*Read at the evening meeting of the Liverpool Chemists' Association, February 12, 1874, and published in the Chemist and Druggist.

†Ann. Ch. Pharm. clviii. 37.

between 90° and 100°; the thermometer then rose rapidly to 160°, and the main product distilled over between this and 180°: the temperature again rose to about 240, but only decomposition products were obtained, and a considerable carbonaceous residue remained in the flask. By means of fractional distillation the portion boiling at 160° to 180° was quickly purified, and a body boiling at 163° to 165° was isolated, which proved to be crotonic chloral.

The specimen I have here was produced by passing perfectly dry chlorine gas over pure aldehyde ($C_2 H_4 O$)—the action is very violent, and many precautions have to be taken to prevent explosion and to condense the volatile products of the reaction, and still to allow the enormous quantities of hydrochloric acid gas to escape. After a time the liquid thickens; at this stage the current of chlorine can be passed through the liquid. After another interval it becomes necessary to warm, and at last to boil the liquid through which the chlorine is passing. At length hydrochloric acid ceases to be evolved, and crude croton chloral is obtained—the process taking about 48 hours to complete. This crude body is *mainly* ordinary chloral, but mixed with a variety of other products. By fractional distillation and treatment with sulphuric acid—true croton chloral ($C_4 H_3 Cl_3 O$)—trichlorcrotonic aldehyde is obtained. This is a dense oily liquid of peculiar odour, somewhat recalling ordinary chloral: treated with a considerable excess of warm water it hydrates and dissolves, and upon cooling, croton chloral hydrate ($C_4 H_3 Cl_3 O, H_2 O$) is deposited, but still in a crude form, most rank and offensive in flavour. It has to be purified by rather a tedious process, and is obtained, when pure, in beautiful white silvery crystals, with a sweetish melon flavour, which melt at 78° C.

From this it will be quite evident (and it is probably wise to note it) that this body does not bear any relation to croton oil, or crotonic acid, obtained therefrom, although its chemical constitution proves it to be the chlorated aldehyde of crotonic acid.

Croton chloral is the substance represented by the same term. in the allyl ($C_3 H_5$) group that chloral has in the ethyl ($C_2 H_5$) group. Its outward appearance differs from hydrate of chloral by the salt being much lighter, and in flocculent silvery crystals—by its being almost insoluble in cold water and very soluble in alcohol: it is soluble in hot distilled water, and rendered more easily so by the addition of 25 per cent. of pure glycerine; it is insoluble in chloroform.

It will be remembered that hydrate of chloral owes its value as a medicinal agent to the supposed elimination of chloroform when it comes in contact with the alkalies of the blood, it having been shown that by reaction with alkalies chloroform is produced. Crotonic chloral, when subject to the influence of an alkali, first forms allyl-chloroform, a trichlorated body, which is rapidly decomposed into a bichlorated substance called bichlorallylene. In a communi-

cation to the *British Medical Journal*, December 20, 1873, Dr. Leibreich says :—" Both chloroform and trichlorated substances act in the first stage upon the brain—in the second, on the spinal cord —in the third, on the heart."

Although Dr. Leibreich's theory has met with and still finds general favour, there are many medical men who think it has not any vital support, believing that chloral exercises a specific action of its own upon the organization, which is not to be reasoned out from an exclusively chemical basis.

The medicinal advantages of hydrate of croton chloral over ordinary hydrate of chloral are :—1st. In cases where hydrate of chloral is inapplicable on account of heart-disease (it does not interfere with the action of the heart). 2nd. In cases of neuralgia in the district of the nervus trigeminus (it is a remarkable phenomenon that when given in small doses it produces anasthesia of the fifth nerve, singling out one nerve, and that one alone, while the sensibility of the body generally and pulse and respiration remain unaffected). 3rd. In cases where very large doses are necessary to produce sleep, here Leibreich recommends the addition of croton chloral to hydrate of chloral.

Dr. Burney Yeo, of King's College Hospital, London, &c., is making a systematic investigation on the value of this medicine, and he lays his first communication in a paper published in the *Lancet*, January 31, 1874; he administered it in six different classes of cases, and gives details of each. The results he has arrived at are, that in croton chloral we possess a remedy of remarkable efficacy in some cases of neuralgia of the branches of the nervus trigeminus, and that it also has the power of affording relief in other obstinate forms of neuralgia; that it is of use in certain cases of diffused muscular pain; that there is scarcely any remedy that is likely to prove more valuable for the relief of the distressing night cough of chronic phthisis. Its efficacy in procuring sleep seems very variable in moderate doses; its effect in purely rheumatic cases is scarcely appreciable, while for hysteria it is of little or no use.

Dose.—Dr. Yeo says :—" I am satisfied that in dealing with this substance we must give an unusually wide range to the dose, for its effects vary greatly. The doses I have given varied from 1 to 10 grains. In delicate females I have found very decided effects from doses of 2 and 3 grains; in strong males a dose of 10 grains is often required to produce any appreciable effect. As may be expected, persons who have been accustomed to the use of anodyne medicines require larger doses than others."

The dose must always be proportionate to the severity and long continuance of the pain. I would advise that it should be always given in moderate and quickly repeated doses, until the amount of "tolerance in the medicine in each particular case has been discovered. In severe neuralgias, from 2 to 5 grains may be

given every hour, or the smaller dose every half-hour, until 15 grains have been taken. At present I do not think it safe to go beyond this dose."

I have made several experiments with different solvents to present this medicine in a convenient form for dispensing, and before seeing Dr. Yeo's paper I found that the addition of glycerine was of great assistance in making the solution. I can fully endorse his decision. The following formulary yields the strongest solution that is permanent:—

Croton Chloral Hydrate.....	64 grains.
Pure Glycerine.....	½ ounce.
Hot Distilled Water	1½ "

A syrup can be made containing 2 grains of croton chloral hydrate in the fluid dram, by adding 4 ounces of simple syrup to the above solution, and the disagreeable taste may be removed by any flavouring the pharmacist sees fit to add.

NOTES ON THE ARECA PALM.*

Areca Catechu, L.

BY JOHN R. JACKSON, A.L.S., CURATOR OF THE MUSEUMS, KEW.

Some interest having lately arisen amongst pharmacists with regard to the Areca palm *(Areca Catechu, L.)* owing to its proposed introduction into the British Pharmacopœia as an officinal plant, a few notes on the tree itself and its uses may not be out of place.

The Areca palm is a handsome tree, growing to a height of from forty to sixty feet, with a slender, erect trunk, averaging from one to two feet in circumference. It has regular, pinnate leaves, and long, linear leaflets, of a rich, dark-green colour. The circumference of the trunk is annulated or distinctly marked with the scars of the clasping petioles of former leaves. The fruits are each about the size of a hen's egg, consisting of a fleshy looking drupe, which, however, on cutting, is found to be very fibrous, containing a seed about the size of a nutmeg, and like that well-known spice, ruminated or marked with thick, reddish-brown irregular lines throughout its entire substance These fruits are borne in large bunches, springing from the crown of leaves. The spathe itself is used in some parts for making drinking vessels, for nailing over the bottoms of boats, and various other purposes.

The tree is known best as the betel-nut palm, and is cultivated

* Pharmaceutical Journal and Transactions.

in nearly all the warmer parts of Asia for the sake of the seeds, which are not only chewed in large quantities by the natives in countries where they grow, but are shipped to countries where the palm is not cultivated. The average annual produce of one tree is said to be about three hundred nuts. The tree is largely cultivated all over India, as well as in China, but is more abundant, perhaps, in Malabar, North Bengal, the lower slopes of the mountains of Nepaul, and the south-west coast of Ceylon. In Travancore alone there are nearly ten millions of these trees, the annual value of the produce of which is estimated at £50,000 stg. It is said that about 80,000 piculs of the nuts are annually produced on the coast of Sumatra. Many varieties of the betel-nut palm are known to the natives under different local names; the nuts also vary much in size, but their quality depends upon their appearance when cut through, "intimating the quantity of astringent matter contained in them. If the white or medullary portion which intersects the red or astringent part be small, and has assumed a bluish tinge, and the astringent part is very red, the nut is considered of good quality; but when the medullary portion is in large quantity the nut is considered more mature, and, not possessing as much astringency, is not esteemed so valuable."

The nuts are usually gathered between the months of August and November. The seeds are removed from the husk and boiled in water. In the first boiling the water becomes red and thick, and this is afterwards evaporated into catechu, but whether it is imported into this country as a commercial article is uncertain. The mode of collecting the catechu in Mysore is thus described:—"The nuts are taken as they come from the tree, and boiled for some hours in an iron vessel. They are then taken out, and the remaining water is inspissated by continual boiling. This process furnishes *kossa*, or most astringent *Terra japonica*, which is black, and mixed with paddy husks and other impurities. After the nuts are dried they are put into a fresh quantity of water and boiled again; and this water being inspissated, like the former, yields the best or cleanest kind of catechu, called *coony*. It is yellowish-brown, has an earthy fracture, and is free from the admixture of foreign bodies."

For the purpose of chewing, the nut is cut into narrow strips and rolled up with lime in the leaves of the betel pepper. The mixture has a hot, acrid taste, and aromatic and astringent properties. The habitual use of the betel-nut is considered by the natives to be very wholesome, but the effects are said by some to be due as much to the ingredients used with it as to the areca nut itself. Its constant use causes the teeth to become black and the mouth and lips of a brick red colour. In some parts of China the nuts, bruised and powdered, are mixed with the green food given to horses, and they are thus considered a preventive against diarrhœa. In

the north of China small pieces of the nut are boiled and the decoction is taken as a domestic remedy in various visceral affections.

Though the use of the betel as a masticatory turns the teeth black, it is said to preserve them from decay in a remarkable manner, and this may be the reason why some English chemists have introduced the pulverized charcoal into this country as a tooth powder.

In Borneo the flowers, which are fragrant, are mixed with medicines and used as charms for the cure of many diseases. In some parts of India the juice of the young tender leaves mixed with oil is applied as an embrocation in cases of lumbago, and a decoction of the root is a reputed cure for sore lips, so that whatever may prove to be the value of the areca nut as an anthelmintic in this country, it is certain that the tree is much esteemed for its numerous uses in the East.

PROPERTIES, EXAMINATION, AND TESTING OF SOME OF THE MORE FREQUENTLY OCCURRING FATTY OILS IN THE VEGETABLE KINGDOM.*

BY G. GLASSNER.

One of the most difficult tasks of a pharmaceutist and chemist is the examination of fatty oils. These substances, besides resembling each other very much in appearance and sp. gr., show in a superficial chemical analysis only very slight differences, and leave the examiner frequently in the dark about their true nature, especially in the case of a mixture of such oils. It is often a matter of grave importance, not only for the pharmaceutist, but also for the public in general, to be able to determine the real purity of an oil. The fat oils of the vegetable kingdom are very numerous, and are found inclosed in separate cells in a large number of seeds and fruits. In order to obtain the oil, the cellular membranes are bruised, are exposed to pressure, or treated either with bisulphide of carbon or "gasoline." From these latter substances the oil is liberated by distillation. Such oils which are burnt, are freed from impurities by sulphuric acid; oils which are strongly colored may be bleached under the influence of light and sulphuric or chromic acid. Solution of permanganate of potash is used for the same purpose.

The fatty oils are mixtures of glycerides of fatty acids and oily acids. They are mostly liquid, nearly insoluble in water, and their sp. gr. is below that of water. They readily dissolve in ether, chlo-

*Translated in American Chemist from Archive fuer Pharmacie.

roform, and ethereal oils, but with difficulty in alcohol, with the sole exception of castor oil. They possess the property of dissolving sulphur and phosphorus. If fatty oils are brought in contact with a solution of caustic potash and are strongly agitated, a decomposition takes place, in which the fatty and oily acids combine with the alkali, and glycerin is liberated (saponification).

Also other metallic oxides act upon fatty oils, and form with them more or less fixed compounds, so-called plasters. Heated to about 500° C. they volatilize under decomposition. The acids are liberated, whilst the glycerin, not volatile without decomposition when exposed to the air, gives off vapors of acrolein, which are easily recognized by their pungent odor. Concentrated sulphuric acid decomposes the oils, unites with the base to glycero-sulphuric acid, and sets free the fatty acids. HNO_3, Cl, Br, I form substitution products. Fatty oils produce a stain on paper, which even heat is not able to remove.

Exposed to the air, fatty oils absorb oxygen, and after some time become thick. Based upon these properties, the fatty oils are divided into those which dry out entirely, and those which become smeary and viscid, but never a hard mass, even if present in very thin layers. The former are employed in the preparation of varnishes and paints. The oils which do not dry out, give off, after standing some time, a rancid smell, and have a disagreeable taste. This rancidity is a true fermentation, which is promoted by the presence of putrescible substances, as mucus and albumen, which produce, besides other products, fatty acids also.

I. *Non-drying oils.*

Such oils can only be detected by the elaidine-test. If 4 parts of oil and 2 parts of HNO_3 of 1·20 sp. gr. are mixed in a beaker, and then ½ part of copper-filings are added, N_2O_3 is generated even in the cold, and this effects, without being changed itself, the decomposition of oleic acid ($C_{18}H_{34}O$) into isomeric elaiodic acid, a solid white mass, which fuses at +45° C., and volatilizes without change. In case the nitric acid used is too concentrated, the generation of N_2O_3 takes place in so violent a manner that the liquid is frequently thrown out of the beaker. The elaidine reaction is produced also by mixing equal volumes of oil and red fuming nitric acid. The most important of the non-drying oils are :—

1. *Oil of almonds*, sp. gr. = 0·917 to 0·920; it is pressed out of the seed of Amygdalus communis. It has an agreeable mild taste, is clear to light-yellow, and of little consistence. It is nearly inodorous, and solidifies—20°. It is soluble in 60 parts of alcohol, and consists chiefly of olein and margarin.* It has no rancid smell if pure. Poppy-seed oil, cotton-seed oil, peanut oil, lard oil, sesame oil, and sweet oil are found as adulterations. The elaidine-test

* Palmitin and stearin : margarin is not found in nature.—Eds. Am. Chem.

produces on pure oil, after 3 or 4 hours, a white or light-yellow color. Red color indicates the presence of sesame oil. If the mass is intermixed with oil drops or streaks, drying oils are present. 5 drops of oil with 1 drop of H_2SO_4 render the color turbid and yellowish, but never dark. 5 vols. of oil agitated with 1 vol. of potash lye of sp. gr. 1·34, produce a white liniment. Equal vols. of fuming nitric acid and oil show, on the place where the two liquids meet, a narrow light green zone, which still remains in the elaidine-mass, but which becomes light bluish-green and extended upwards in the presence of only a little olive oil. 6 parts of oil and 1 part of chloride of lime, titurated with a little water, produce a liniment, out of which the oil soon separates again. (Different from poppy-seed oil.)

2 *Olive oil*, sp. gr. = 0·910; it is obtained from the Olea Europæa. It is pale yellow or colorless, has an agreeable taste and smell. It consists chiefly of margarin* and olein.

A few degrees above zero the margarin* crystallizes out and causes the solidifying of the oil. The olive oil, in using the elaidine test, becomes, after two hours, turbid, and after six hours solid and white.† Whilst stirring, this mass crumbles, which in presence of $\frac{1}{20}$ part of poppy-seed oil would become tallow-like, and in presence of $\frac{1}{10}$ of this oil would hardly be more consistent than lard. The solidifying of the elaidine mass commences, if pure oil is used, according to Soubeiran, after 43–59 minutes, in presence of poppy-seed oil after 50 minutes later. If 10 parts of oil are agitated with 1 part of ammonia, a thick liniment results, whilst poppy-seed oil, under the same circumstances, would produce a crumbly mass. Equal volumes of red fuming nitric acid and oil show on their line of contact a beautiful bluish-green ring which is paler on its upper ends. 5 parts of olive oil and 1 part of potash lye of 1·34 sp. gr. form a liniment of the same color as the oil. Adulterations are: Rape-seed oil, linseed oil, poppy-seed oil, madia oil, and cotton-seed oil.

Drying oils are usually recognized by the eladine test. Ethereal oils, which are frequently added to the common cotton-seed oil in order to reduce the duty thereon, float unchanged on the elaidine mass. Sesame oil would color these red. Lard oil solidifies at 4°–5° below olive oil. Hanchecorne gives the following reaction to recognize the pure olive oil. When three parts of olive oil are heated in a steam-bath with a mixture of three parts of nitric acid of 40° and 1 part of water, the pure oil becomes clearer and of a lighter yellow color. If the oil has an admixture of cotton-seed oil, the color will be red. Whilst Pugliese or Gallipoli oils are yellow

* Palmitin and stearin; margarin is not found in nature.—Eds. Am. Chem.

† According to Knapp a mixture of 1 part of N_2O_4 with 33 parts of olive oil solidifies in 70 minutes, with 50 parts of olive oil in 58 minutes; with 100 parts of olive oil in 130 minutes; with 400 parts of olive oil not at all.

and clear, we find that the Calabria oil has often a greenish color, which may have been caused by an addition of dyes, but likewise by copper. Frequently it is difficult to detect the presence of oxide of copper in olive oil. If the quantity of the dissolved oxide of copper is large, lay a polished iron spatula in the oil, add a little hydrochloric acid, and heat the whole on a water-bath from 3 to 4 hours. A part of the oxide of copper may also be separated from the oil by continued boiling with dilute hydrochloric acid. The liquor is then filtered through thin paper, evaporated to dryness, and ignited; the oxide of copper is dissolved out of the ash by hydrochloric acid and precipitated by ammonia, sulphuretted hydrogen, or ferrocyanide of potassium. But all these tests will in no way give a perfectly sure result, as the oxide of copper was combined with organic acids. To give the quantity of copper, the author considers the following method, which was repeatedly used by him, a practical one. A quantity of oil is weighed, and chemically pure hydrochloric acid is added, it is then heated to boiling over a spirit lamp, and chlorate of potash added. The oil decomposes gradually, and forms, after some time, a frothy mass, solid in the cold. Filter now, neutralize the acid solution partially, and pass in sulphuretted hydrogen gas, whilst heating gently. The resulting precipitate is collected on a filter. The residue of the first filtration is ignited, the copper dissolved out of the ash and precipited by sulphuretted hydrogen. Both precipitates of sulphide of copper are then united and determined in the regular quantitive way. It is a little more simple to saponify the olive oil in which copper is suspected with concentrated caustic lye, to decompose the soap by hydrochloric acid, and separate hydrochloric acid solution by filtering from the oily acids, and to precipitate the copper in the filtrate. But I think this method less reliable than the previous one. Oxide of lead may be dissolved out of the oil by dilute acetic acid, with agitation, and may be precipitated by sulphuric acid.

Rape-seed oil, sp. gr. = 0.910, is obtained by pressure from the seed of brassica napus, brassica campestris, and others. The fresh-pressed oil has a yellow to yellowish green color, and is pretty thick. Only the oil used for burning is refined by sulphuric acid, and contains therefore no mucus, while it is retained by the salad oil. Rape-seed oil is nearly pure oleine, and gives a smeary plaster when boiled with oxide of lead and water. Pure rape-seed oil gives a white mass when shaken with $\frac{1}{5}$ vol. potash lye of 1·34; in the eladine test the oil solidifies after about 5–6 hours. As adulterations have been found: linseed oil, hemp seed oil, and train-oil. When linseed oil is present, the liniment turns greenish with potash-lye, and changes to a yellow brown when heated to boiling. If train oil were present, the color would be red; if hemp-seed oil be present, the liniment will be solid and brown. A very small quantity of train oil may be found by the addition of one drop of sulphuric acid. The drop of

acid spreads in the oil at once to thread-like stripes, which run undulating to the bottom, and have first a red, afterwards a black color. Rape-seed oil, and hemp-seed oil take a dark-green color, when mixed with equal vols. of sulphuric acid. Even $\frac{1}{1000}$ part of train oil is said to be recognized by the coloring from red to black, when a little syrup of phosphoric acid is added. When 15 drops of rape-seed oil are placed in a porcelain dish and one drop of sulphuric acid is added, a greenish-blue halo, with brown stripes, appears around the acid. When mixed with an equal volume of fuming nitric acid, a brownish-red zone forms at the point of contact, which shades off in greenish hue towards the bottom. If after refining, sulphuric acid is still contained in the oil, it can be detected in the following way. Equal volumes of chemically pure concentrated soda solution and oil are well shaken together, a little NaCl solution is added and again well shaken. When the oil is free of acids, it rises after a few minutes and collects at the top. But when it contains acids, a white emulsion forms at once, which is more or less consistent, according to the amount of acid it contains. But the NaCl solution must be entirely free of caustic lye, because the latter will form an emulsion also with oil, free of acids.

s. *Sesame oil*, sp. gr. = 0.923, is gained from the seed of Sesamum orientale; it is a light to brownish-yellow oil, which does not smell disagreeably; it solidifies at—5°, and is composed nearly entirely of oleine. Boiled with oxide of lead and water, it gives a smeary plaster. When equal volumes of sesame oil and a cooled mixture of concentrated sulphuric and nitric acids are brought together, a bluish-green middle zone ensues. By adding a few drops of bisulphide of carbon, the coloring is of a more beautiful green and remains longer. In the elaidine test the oil solidified and becomes of a yellowish or red color. How to detect sesame oil when mixed with other oils, has been shown before, at the respective places.

5. *Palm oil* is obtained from the green peels of Elais guyanensis. It fuses at + 27°, and consists principally of so-called margarin [palmitin—EDS. AM. CHEM.] and oleine. It becomes easily rancid, and is then less fusible. By heating under admission of air it can be decolorized. With caustic potash it gives a yellow soap.

6. *Lard oil* (so called) can be manufactured, according to Ihlo, by heating 32 parts of rape-seed oil with one part of fine pulverized potato-starch in a sand-bath until a sweet smell comes forth. After cooling, settling, and filtering, a clear, yellowish, agreeably smelling and tasting oil is obtained, which solidifies at +6° to 8°C., and which is used in the manufacture of perfumed oils.

II. *Drying oils.*

When these remain for a long time in contact with the air, they absorb oxygen, become constantly thicker, and finally dry out entirely. Contrary to the non-drying oils, this oxidation is retarded

by presence of mucus or albumen; therefore, these oils dry the quicker, the more such substances are removed. The drying is accelerated by the addition of metallic oxides, such as oxide of zinc or lead. These oils are used for varnishes and paints. Through the influence of nitrous acid on drying oils, suberic and pimelic acids are formed, amongst others. But the elaidine reaction does not take place, as the linoleic acid is not solidified by nitrous acid. The composition of this acid, which occurs likewise in the poppy seed, is $C_{16}H_{28}O_2$. All drying oils, when boiled with oxide of lead and water, give smeary plasters, which dry out after some time.

1. *Linseed oil*, sp. gr. = 0·930, is obtained from the seed of linum usitatissimum. It is greenish-yellow, has a peculiar smell and taste, is of a syrupy consistence, and solidifies only at—16° to 20°. When mixed with nitrous acid, its color is red. If equal volumes of oil and red fuming nitric acid are mixed in a beaker, the mixture takes first a green color and then a red one towards the upper part. Frequently the reaction is so violent that the liquid spurts out of the beaker. If five volumes of oil are mixed with one volume of potash lye of 1·34, and then strongly agitated, a greenish-yellow liniment is formed, which becomes fluid and yellowish-brown after boiling. Hemp-seed oil would form under the same circumstances a brown solid mass. If equal volumes of hemp-seed oil are mixed, a greenish coloration results.

2. *Poppy-seed oil*, sp. gr. = 0·913 to 0·924, is procured from the seed of Papaver somniferum. It is yellowish-white, and if old perfectly white, and has an agreeable taste. It is a thin liquid, and if in the bleached state (when it is rancid and in an easily drying condition) may be used in oil painting. The poppy-seed oil solidifies at—18°. Brought in contact with an equal volume of red fuming nitric acid, a dark green middle zone is formed, changing into pink in its upper layers. 84 volumes of poppy-seed oil, triturated with one part of good chloride of lime, furnish a liniment, out of which it is very difficult to separate the oil. (Difference from oil of almonds.) When ten parts of poppy-seed oil are mixed with from 2 to 3 parts of sulphuric acid, a pure yellow coloration of the liquid ensues in the beginning, and after stirring some time it changes to brown olive-green, producing at the same time an increase of temperature. Maumene has given a detailed explanation of this phenomenon. If 50 grms. of oil are agitated with 10 c. c. sulphuric acid of 66° B., the temperature increases in case of a mixture of poppy-seed oil and olive oil from 70° to 80°, in case of pure olive oil only about 42°, elaidine test does not influence the poppy-seed oil, and occurring adulterations with non-drying oils may in this way be easily detected.

3. *Castor oil*, sp. gr. 0·950 to 0·970, is produced from the seed of Ricinus communis. The castor oil contains two fatty acids, the ricinostearic acid and ricinoleic acid, together with oxyde of glyceryl

and a resin. Œnanthol results from the dry distillation, and during the oxidation by HNO_3, œnanthylic acid is formed. When heated with hydrate of potash, caprylic alcohol is formed, and sebacic acid. If before the pressing the peels are removed from the seed, the resulting oil is a colorless one; if the seeds are roasted, a yellow oil is obtained. The American oil has a larger percentage of ricinostearin than the West Indian and French oil has, and becomes at a comparatively low temperature thick and turbid. The oil is of a syrupy consistency, colorless or slight yellow, and transparent. Its taste is mild in the beginning, afterwards a little sharp. Exposed to the air it becomes rancid and dies out. It soldifies at—18°, and readily dissolves in absolute alcohol. If three parts of castor oil are dissolved in an equal volume of bisulphide of carbon, and two parts of crude sulphuric acid are slowly added, the castor oil separates as a slimy, reddish-white mass, which is insoluble, even in an excess of bisulphide of carbon, unless washed. In the elaidine test, this oil becomes first of a whitish color, and solidifies after 6—8 hours to a wax-like mass (ricinoelaidin). As adulterations, we find sesame oil and sunflower oil. In this case, the oil in the elaidine test is yellowish, reddish, or red in the beginning, and afterwards a soft, yellow, or brown mass. Pure oil is perfectly soluble at $+30°$, $-35°$, in an equal volume of alcohol, but as soon as it contains more than 5 per cent. of other oil, the solution is turbid.

The following scheme gives the tests which are most in use. The reactions enumerated will take place with exactness only in the presence of non-adulterated oils; but in most cases, when the mixture is not too complicated, will be sufficient to determine an oil. The potash lye which has to be used must be prepared from chemically pure potash. The red fuming nitric acid used by the writer of this had a sp. gr. of 1·40. To determine the sp. gr., the elometers made by the academical optician Desaga in Heidelberg, may be used-

Scheme for the Analysis of Fatty Oils at Ordinary Temperatures.

5. vols. oil mixed with 1 vol. potash lye of 1·34 and strongly agitated. The mass is—	Snow white. Oil of almonds, very good rape-seed oil, bleached olive oil.	Yellowish Poppy-seed oil, olive oil, rape-seed oil, sesame oil.	Greenish. Linseed oil, hemp-seed oil, oils containing Cu, and artificial dyes.	Pink color. Refined rape-seed oil.	Brown and stiff, Hemp-seed oil.	Yellowish brown and fluid, Linseed oil.	Red. Train oil.
Mix in a beaker carefully equal vol. of oil nd red fuming nitric acid. A middle zone forms on point of contac . This is—	Narrow and light green; oil becomes flocculent and opaque. Oil of almonds.	Dark green; pink above Poppy-seed oil.	Broad and beautiful light blue-green. Olive oil.	Brown-red. Cod-liver oil.	Green, red above Linseed oil.	Brown-red, greenish below Rape-seed oil.	The oil colors throughout red, after some time. Linseed oil.
Mix in a beaker the oil with co.ncentrated sulphuric acid. Layers where oil and acid meet are colored—	10 drops of o.l, 2 of concentrated sulphuric acid.			Equal volumes oil and acid.			
	Beautiful green, with brown stripes. Rape-seed oil.	Yellow; after agitating, brown and olive-green. Poppy-seed oil, madia oil.	Red, soon changing to black, stripes undulating through the liquid. Train oil.	Without bisulphide of carbon.			With bis'p'de carbon.
				When agitated, fine dark green, Rape-seed oil.	Green. Linseed oil, Hempseed oil.	Red Train oil.	With 20 times its vol, CS_2, splendid violet, quickly changing to brown coloration train oil.
In the eladine test the oil mass is—	Solified, crumbling, and white Olive oil, oil of almonds, bleached rape-seed oil.	Solidified, crumbling, and yellowish. Rape-seed oil.	Solidified and red. Sesame oil.	Wax like and white. Castor oil.	Theeladine mass shows oil drops *an stripes.* Oil mixtures containing drying oils.	Unchanged. Linseed oil, Poppy-seed oil, nut oil.	Ethereal oils, added to the olive to correct the smell, float on the elaidine.
In boiling with water and oxide of lead a plaster is formed, the consistance of which is—	Solid. Olive oil.	Smeary. Rape-seed oil, oil of almonds, sesame oil.	Smeary, but drying after some time. Drying oils.				
Solubility of 1 part oil in alcohol:	1 : 1 Castor oil.	1 : 25 Poppy-seed oil.	1 : 30 Hemp-seed oil.	1 : 40 Linseed oil.	1 : 60 Oil of almonds.		
Specific gravity of oils is—	0·913 Poppy-seed oil, and oil of brass. nap.	0·914. Oil of almonds, oil of brass. camp.	0.918 Olive oil.	0·923 Sesame oil.	0·924 Sunflower oil.	0·950—0·970 Castor oil.	0·930 Linseed oil
No. of degrees Celsius at which the oils change from solid to liquid state:	—27° Hemp-seed oil.	—18° Castor oil. +2·5+6° to +8° Olive oil, lard oil.	—16° to —20° Linseed oil. —20° to —25° Oil of almonds.	—16° Sunflower oil.	6° Oil of brass. napus.	—40° Oil of brass. camp.	—5° Sesame oil.

THE THERAPEUTICAL VALUE OF THE SULPHIDES.*

An excellent article is contributed to the *Lancet*, February 21st, by Professor Sydney Ringer, on the sulphides of potassium, sodium and calcium. He says :

I wish to call attention to the value of sulphides, present in many natural waters, in abscesses, boils, and scrofulous sores. The influence of the group on the suppurative process is easily made manifest. Thus when sulphide of potassium or calcium is administered, a thin, watery, unhealthy discharge becomes at first more abundant, afterwards diminishing, and throughout continues thicker and healthier, possessing indeed the characters of " laudable" pus. The condition of the sore improves correspondingly, and its healing is promoted.

Their efficacy may be frequently demonstrated in cases of the following kind. An unhealthy child, from six to twelve months old, suffers from a slight sore throat, perhaps occurring in scarlet fever or measles. The sore throat produces considerable enlargement of the glands behind the angle of the jaw. The swelling, of stony-hardness, may be sufficiently large to interfere with swallowing and to push the head on one side. Suppuration takes place, but is very deep-seated, and for a long time there is neither redness of the skin nor fluctuation, and the pus very slowly makes its way to the surface, so that a fortnight, three weeks, or even a month may elapse before the abscess bursts, or is fit to be opened, when a deep hole is left, with considerable induration around it. The pain and constitutional disturbance are so great that the child sometimes dies; and even if this termination is averted, the deep discharging hole heals very slowly, owing to the indurated and unhealthy state of the adjacent tissues. If a tenth of a grain of sulphide of calcium, mixed with a grain of sugar of milk, is given in such a case every hour or two hours, the results are most striking. The swelling becomes smaller, the pus reaches the surface in four or five days, and when it is evacuated leaves a benign wound which quickly heals. The effects of these remedies are equally conspicuous in mammary abscesses, although in rare instances they appear temporarily to increase the pain, a remark which seems sometimes to hold good with respect to boils. But as a rule the pain is speedily mitigated. Singular to say, I have found these remedies of much less use in forwarding the maturation and expulsion of pus in indolent buboes, but my experience of their use in buboes has been but small.

In boils and carbuncles these remedies yield excellent results. A tenth of a grain of sulphide of calcium, given every two or three hours, generally prevents the formation of fresh boils, while it lessens the inflammation and reduces the area of the existing boils,

*Phila. Medical and Surgical Reporter.

and quickly liquefies the core, so that its separation is much more speedy, thus considerably curtailing the course of the boil. Where the skin is not yet broken, and the slow-separating core therefore not yet exposed, the sulphides often convert the boil into an abscess, so that on bursting pus is freely discharged, and the wound at once heals. These remedies meanwhile improve the general health, removing that debility and malaise ordinarily so markedly associated with these eruptions. In some cases, however, as in the deep-seated boils and abscesses of diabetes they are powerless. In carbuncles the sulphides will generally be found equally serviceable, melting, as it were, the core into healthy pus, and so quickly expelling the dead and otherwise slow-separating tissue. In abscesses and carbuncles it is useful to apply belladonna over the inflamed part to reduce inflammation and allay pain. The skin should be thickly smeared with equal parts of belladonna and glycerine, and over this a poultice applied, renewing the belladonna each time the poultice is changed. Poultices, however, being liable to bring out a fresh crop of boils, one of the following plans should be adopted: Smear belladonna ointment some distance round but not over the boil, and then apply a poultice, the greasy application thus protecting the neighboring tissues. Or, still better, apply a belledonna or opium plaster on leather, with a hole the size of the boil around the swelling, and through the opening smear glycerine and belladonna, covering all with a small poultice. The leather plaster efficiently protects the surrounding skin and averts the production of fresh boils.

I have thought it worth while to mention these useful plans of protecting the boil; but it is scarcely necessary to observe that whilst investigating the effects of sulphides, I have employed them alone, or at most sometimes using only a poultice. The good effects of sulphides are conspicuous in certain scrofulous sores not uncommonly seen in children.

The sulphides appear to me to exercise a very beneficial influence in suppurating scrofulous glands in the neck. Here, again, they hasten the elimination of the pus, and subsequently the cheesy scrofulous matter. After the abscesses have burst, and continued slowly discharging a scanty, unhealthy pus, and when the edges of the sores have become much thickened and indurated, these remedies render the discharge more abundant, thick, creamy, and unhealthy, considerably hasten the evacuation of the scrofulous matter, which prevents the healing of the wound, and at the same time softens the round indurated edges, so that the sore heals much more speedily. If small doses appear to affect these sores but little, larger doses, as half a grain or a grain, should be given several times a day, or even every two hours. I need hardly say that to compass the results described the treatment must be continued several weeks, for it is vain to expect them to occur in a few days, when the sores have been discharging perhaps for months or even years.

NEW THERAPEUTIC REMEDIES.

At a recent meeting of the Medical Society of the DublinCollege of Physicians, Dr. Walter G. Smith read a very interesting paper from which we make the following extracts, taken from a report published in the *Chemist and Druggist* :—

The lecturer classified the various new remedies under the following divisions :

I. *Alkaloids and active principles* ; guarana, methyl-strychnia, emetia, apomorphia, ergotin.

II. *Hydrocarbides and their derivatives* : xylol, bromoform, iodoform.

III. *Alcoholic Compounds* : Nitrate of amyl, bromal, chloral, croton chloral, propylamine (so-called.)

Guarana—This drug is an example of an old remedy re-introduced, for it was first noticed as far back as 1817. In connection with its medicinal action, it is worth remembering that its active principle, the so-called *guarania*, is identical with the well-known caffeine or theine, a base which occurs also in Paraguay tea (Matê) and in the kolanut of West Central Africa. Guarana is practically nothing but a convenient channel for the administration of impure caffeine. Curiously, the five genera in which caffeine is known to exist belong each to a different natural order.

Methyl Strychnia—This remarkable body, $C_{21}H_{22}N_2O_2^1CH_3HO$ is not only interesting in itself, and as a specimen of a now numerous class of organic substances, but is more especially noticeable as an illustration of a recent and novel method of inquiry, which can scarcely fail to bear important fruit. I refer to the study of the connection between chemical *constitution* and physiological action—a subject which has been so successfully prosecuted by various observers, notably by Crum Brown and Fraser, in Scotland, and by Pellisard, Jolyet, and Cahours, in France.

Brown and Fraser have shown that the *addition* of various organic radicals—*e.g.*, methyl and ethyl—to the molecule of some highly active bodies, such as the alkaloids, without destroying or altering the chemical integrity of the body, effects most extensive and unexpected changes in their physiological action. Iodide of methyl is inert in itself. For example, this very body, the hydrate of methyl-strychnium, produces a condition exactly the reverse of that produced by strychnia, and, in fact, instead of causing muscular spasms, due to increase of reflex excitability of the cord, it actually paralyses the peripheral terminations of the motor nerves, and it has accordingly been suggested as an antidote to strychnia poisoning. 0·1 gr. of hydrochlorate of strychnia caused death in a rabbit in half an hour, while 30 grs. of iodide of methyl-strychnium (containing 21·1 grs of strychnia), previously administered to the

same rabbit, produced no effect whatever. In other words, more than two hundred times the amount of strychnia can be administered with impunity in the form of the ammonium base than as any of the ordinary salts of this alkaloid. The ammonium bases of brucia, thebaia, codeia, morphia, nicotia, and atropia, have also been examined with the like startling results.

In the case of atropia, the poisonous activity of the base, instead of being so enormously diminished, is considerably increased, so that we cannot formulate any law as to quantitative alteration of toxic energy. Interesting as these researches are, too extreme importance should not be attached to them, and they throw little light upon the question of the respective actions of the different alkaloids.

Emetia—This substance is noticed in conjunction with the next, apomorphia, because they are the only two bodies which can be fitly employed subcutaneously as emetics. As in the case of ergot, we should distinguish pure emetia, *i.e.*, the alkaloid, 15s per 3j., from the preparation sold in France under the name of "coloured emetin," which is nothing but a brown extract, and is 12s per ounce. Pure emetia is at least three times as strong as the impure, and is recommended as a safe, rapid, easy, convenient, and agreeable form of emetic. The dose by the mouth is from 1-18 to 1-6 gr., and subcutaneously, about 1-30 gr. (1 in thirty water, with a little sulphuric acid.) Its solubility in water is 1 in 1,000. Its salts are uncrystallisable, and are very soluble in water.

Apomorphia—The alkaloids are steadily and deservedly gaining confidence every day, and atropia, morphia, strychnia, quinia, &c., are counted our most trusty remedies. But hitherto we have been restricted to bases derived directly from the plant, and apomorphia is the first example of an alkaloid introduced into medicine which has been derived by decomposition from a pre-existing and well-known alkaloid, *i.e.*, it is a product, and not an educt.

The ordinary emetics are usually bulky in dose, uncertain in action, and are apt to produce depressing nausea and prostration, and apomorphia opportunely presents itself as a convenient and unirritating emetic, the one of all others which acts most speedily, and with least trouble to the patient. It is prepared by heating morphia for two or three hours with excess of hydrochloric acid; or, similarly, from codeia, which is methylmorphia. The free base is unstable, and, originally white, turns green immediately on exposure to air. The hydrochlorate is more permanent, but even its watery solution begins to alter in a few minutes, and rapidly passes from an aquamarine tint to an emerald green colour, and ultimately becomes opaque. The physiological effects of the coloured solution are said to be similar to those of the recent solution, but it is less powerful, and is more irritating to the skin. 1-30 to 1-20 gr. is a suitable dose for hypodermic injection. A solution of 1 gr. in 200 minims of

water is a convenient formula. Occasionally giddiness, cerebral oppression, and præcordial anxiety have followed its use.

Apomorphia offers special advantages in dealing with refractory children, insane people, or with adults in some kinds of poisoning, when coma or delirium hinder oral administration. The only drawback is its costliness, and at present 3j costs £1—*i.e.*, 4d a grain.

In illustration of its effects I will mention two cases in which I have employed it. Some time since I injected 1-30 gr. of apomorphia from a green solution into the arm of a woman at the Adelaide Hospital. In ten minutes the stomach turned without causing her pain or distress. On December 6th I injected 1-20 gr. of apomorphia from a fresh solution into the arm of a patient suffering from spasm of the œsophagus, an affection to which he has been occasionally liable since an attack of cholera in 1867. He was of a peculiarly placid and unexcitable temperament. Five minutes after the injection the pulse had risen from 70 to 104, and he complained of a sensation of heat in the head and of nausea, which rapidly increased. In ten minutes he was inclined to be sick, but could eject nothing, and there was a sudden call to stool. The bowels were moved a second time in five minutes more: motions thin, copious, and very offensive. After the expiration of twenty minutes the pulse had fallen to 56; he was sleepy, pale, and felt and looked much prostrated. Within two hours he had completely recovered. No effect was produced on the œsophageal spasm, which was absolute and complete for a period of 122 hours, when the "stomach opened" after a long continuance of retching, and he was able to swallow some food.

Apomorphia is a striking instance of the assistance which scientific chemistry may, and does, lend to therapeutics, and it establishes another link between chemistry and medicine. Moreover, it evinces the radical alteration produced in the physiological action of a substance by instituting an *apparently* slight change in its molecular constitution. In this particular case, the withdrawal of a molecule of water causes such a re-arrangement of the atoms that we obtain new and unlooked for results, for apomorphia, $C_{17}H_{17}N_2O$= morphia, $C_{17}H_{19}NO_3$, minus water, H_2O.

Ergotin.—No better example than this can be brought forward of the confusion which results from the same name being applied to several distinct substances, or from a definite term being affixed to a body of unknown or uncertain composition. There are no less than three totally distinct substances included, under the common designation *ergotin*, viz:—Wiggers' ergotin (1831), Bonjean's ergotin (1840). and Wenzell's ergotin (1864).

1. *Wiggers' Ergotin* is prepared by acting upon the spirituous extract of ergot, previously freed from fat with water, whereby the reddish-brown powder is left behind. It has a bitter taste, and is insoluble in water and ether, and difficulty soluble in spirit. Like

Bonjean's preparation, it is an impure substance. In doses of from 3 to 7 grs. it gives rise to a nauseous bitter taste, followed by a confused feeling in the head, running on to headache, dilation of the pupils, fall in the pulse, and abdominal pain ; 7 grs. caused a further sensation of dryness in the throat, lasting for several hours. It costs 5s per drachm.

2. *Bonjean's Ergotin*—Prepared by exhausting the watery extract of ergot with spirit or wine, and evaporating the spirituous solution. It is a brownish-red extract, with a peculiar odour of roast meat, and a sharply bitter taste. It is completely soluble in water and spirit, and is evidently a complex product. Its action appears to be similar to that of Wiggers' ergotin. Cost, 1s. 6d. per ounce.

Wenzell's Ergotin—According to Wenzell, ergot contains two alkaloids, ecboline and ergotine, which can each be obtained as an amorphous, brown, feebly bitter powder, easily soluble in water and spirit, insoluble in ether and chloroform. The property of exciting contraction of the uterus is stated to reside in the ecbòline, but this statement needs confirmation. These bases seem to rest upon a slender foundation, their relations to Wiggers' and Bonjean's ergotins is not determined, and, in short, as matters stand at present, it is impossible to give a satisfactory answer to the question—what is the active principle of ergot ?

II.—Of the second group little need be said, further than to point to the specimens on the table.

Xylol had a very short-lived run in the treatment of small-pox, in which it was administered in capsules, in doses of 10 to 15 m. It belongs to the small but important group of bodies known in chemistry as the aromatic hydrocarbides, from the agreeable odour of some of their compounds, *e.g.*, essence of bitter almonds. The first term of this homologous series is the familiar benzine or benzol, C_6H_6, and above this are five higher terms, the third of which is xylene or xylol, $C_8 H_{10}$.

Its name is derived from a Greek word signifying wood, because it was first found among the oils which are separated from crude wood spirit by the action of water.

When we consider the importance of the group of hydrocarbides to organic chemistry, and call to mind that they are hundreds in number, exist in every variety of form, and with every variety of properties, thus constituting in themselves a compact and symmetrical range of series, mutually connected by simple laws, it seems strange how little medicine has borrowed from them, for, with the exception of the terebene series, including oil of turpentine, and its numerous isomers, oil of juniper, oil of lemon, &c., it has not yielded much to the stores of therapeutics.

Chloroform, $CHCl_3$—*Bromoform* $CHBr_3$—*Iodoform* CHI_3.

These three bodies afford additional confirmation, were that

needed, of the remarkable gradation of properties which exists between their halogen parents, Cl, Br, and I, and which extends throughout the majority of their combinations.

Thus Cl is a greenish-yellow gas.
Br is a red liquid.
I is a dark solid.

So we have—

$CHCl_3$—a colourless liquid.
$CHBr_3$—a reddish liquid.
CHI_3—A sulphur-yellow solid.

Bromoform is less volatile than chloroform, more easily decomposed by alkalies, and appears to enjoy much the same properties as iodoform, but it is irritant, and does not appear likely to fulfil any useful indications in practice.

They are all prepared in an analogous manner. *Iodoform* contains 90 per cent. of iodine, and yet its taste is mild and non-corrosive. It is not new, for it was discovered in 1823, and has been long in use on the Continent. There is much evidence in its favour, and from its non-irritating action, ready absorption, and peculiar anæsthetic effect locally, it seems surprising that it has not come into more general use. Dose ½ to one grain.

GHAZEEPORE ROSE-WATER.*

The following interesting information on the cultivation of roses and the preparation of rose-water at Ghazeepore has been taken from the Catalogue of the Indian Department at the Vienna Universal Exhibition, for which it was written by Mr. R. Saunders.

"The roses from which the celebrated Ghazeepore rose-water is distilled came originally from Bussorah. These roses were first transplanted from Persia, and brought to the ancient, but now ruinous, Hindu city of Kanauj on the Ganges, and thence to Ghazeepore.

Somewhere about a century ago, Shaikh Abdullah (the father of the last Nawab Fuzl Alee Khan) made the first trial of a rose plantation in the vicinity of the city of Ghazeepore. Having experimented on a very limited scale in his own garden, he discovered that the soil of the evirons of Ghazeepore was admirably adapted for rose cultivation, and since that period it has by degrees been extended.

The celebrity of the Ghazeepore perfumes prepared from these roses very soon spread throughout India, and to other countries, while to this day they have been held in the highest possible esteem on account of the permanence of the odour, and the peculiar delicate

*Pharm. Journ. & Trans.

fragrance of the scent for which they are specially appreciated in the mercantile world. Year after year traders come from immense distances to work temporary distilleries, for the season only, in order to replenish their stock of these delicious and precious rose-scents.

Culture of the Roses, and Plantation of Rose Gardens.—Unlike the propagation of the specimen roses of England which depend chiefly on grafting, these rose trees are raised from cuttings which are planted out from nurseries after one year's growth at an expense of Rs. 25 per beegah. These slips are watered every five or six days till the setting in of the rains, and when once they have taken root they are finally transplanted to the field intended for the rose-garden. Here each rose tree is planted three feet apart from the other, and on an average 1000 shrubs are allowed to grow in each beegah of land.

Rose fields are kept scrupulously clean by constant weeding, and loosening the soil around the roots. This operation takes place about three times a year. Leaf-mould, which is the best sort of manure for roses, is sprinkled all over the fields once a year, and twice a year the fields are irrigated by flooding them with well water. Priming takes place annually in the month of January. The flowering season is in February and March, when the blossoms are picked and collected each day before sunrise.

The average yield of flowers per beegah is from 30,000 to 60,000. These are sold to the distillers at a rate varying from 100 to 120 rupees per lakh (hundred thousand) of flowers. The total area under rose cultivation in Ghazeepore is estimated at about 200 acres, bearing an average rental of Rs. 4 per beegah.

Process of Manufacturing Pure Attar of Roses.—A gallon, or half gallon, of the best rose-water is kept in a large copper vessel in the cool night air, with a thin cotton covering over it. Before daybreak the oily extract floating over the surface of the water is carefully collected with a pigeon's feather and placed in a phial.

The next day fresh flowers are added to the water, and it is again distilled, and the same process is continued for several days successively, till as much pure attar of roses is collected as is required. The whole quantity thus collected is kept in a phial and exposed to the sun for a few days, and as soon as the watery particles have evaporated pure oil, or attar of roses, is left in the phial, which sells by weight at Rs. 100 to Rs. 125 per toolah. This sort of attar being costly is generally made only to order, and the ordinary quantity produced each year rarely exceeds five or six toolahs. The rose-water left after eight or nine distillations again comes into use, and is sold in the market as the best of its kind. It is, in fact, a clear profit to the manufacturer, who is already amply repaid by the attar itself. The prime cost of a toolah of attar is fairly estimated at Rs. 72, viz :—

Cost of labour.....	Rs. 12 0 0
Value of 50,000 rose flowers at 120 per lakh	Rs. 60 0 0
Total.....	Rs. 72 0 0

The margin left to the manufacturer after covering the cost of interest on outlay does not fall far short of 40 or 50 rupees per toolah which it must be admitted is not at all a bad profit on the transaction.

Manufacture of the Alloyed or Ordinary Bazaar-sold Attar.—Sandal wood is well pounded and mixed with water, and then subjected to the usual process of distillation with roses. This gives a greater quantity of oily substance than could be expected from roses only. The same water is distilled over and over again with an additional quantity of fresh flowers as many times as suits the fancy of the manufacturer.

The value of this attar rises in proportion to the number of distillations, and the best of the kind sells at Rs. 10 per tolah down to the lowest rate of Rs. 2 for the inferior sorts. The process of collection of this attar is the same as that of the other, the only difference between the two being in the admixture or not of sandal wood oil.

It is difficult to estimate with any degree of accuracy the quantity of alloyed attar annually produced in Ghazeepore, for a large number of outsiders come every year, stop for the season only, and then carry off what they produce. Probably a maund would be near the mark, but the value cannot be accurately computed, owing to the great variety of rates for the different qualities manufactured.

Manufacture of Plain Rose-Water.—The process is simple, but the varieties are great according to the number of flowers allowed to each distillation. The ordinary rose-water is sold in huge spherical glass receptacles called "karabas," each containing 14 quart bottles. The average selling price of ordinary rose-water varies from Rs. 2 to 12 per karaba, and English quart bottles from 8 annas to 8 rupees each.

The usual cost of labour for each distillation yielding 24 bottles is one rupee. During the season numerous temporary rose-stills are worked by traders from different parts of India. Consequently it is very difficult to make even an approximate estimation of the actual quantity produced, but it is supposed to be somewhere between two and three hundred maunds.

Editorial.

PATENT MEDICINES.

The trade in patent medicines may be regarded as one of the institutions of America. Of all places on this wide earth it seems best fitted for the growth and development of this species of imposition. Transatlantic countries may boast of names standing high in the annals of empiric fame, but they cannot show the mountains of wealth, the mighty influence, or the millions of subjects over which the princely potentates of quackery preside on this side of the water. To the United States must be awarded the palm; there the system flourishes in unrestrained luxuriance. Nor is Canada far behind, at least as far as devotion to the cause is concerned. The field of operations is, necessarily, much smaller, but the desire to quack and be quacked is not the less ardent; and though we have, so far, been in great part dependent on the Americans for the wherewithal to foster this spirit, we are fast merging into a position of independence, and no doubt will shortly be able to claim a fair second place.

That this branch of native industry is rapidly progressing we are all well aware, and however reluctant we may be to acknowledge it, the home-made patent medicine man is becoming a great fact. His origin is by no means obscure; one can day by day watch the various stages of development. We have especially marked three classes from which these persons originate. First, the druggist—if druggist he may be termed—ignorant, incompetent, impecunious and of great greed. Unable to take the position which his name would imply, and possessing neither the confidence of physician or patient, he naturally drops to the level of quackery. A few bills, stealthily posted by his own hand, announce the discovery of an universal panacea, a sarsaparilla, an elixir, pain killer, or what not. An advertisement in the local paper; by-and-by a travelling agent, who, paint brush in hand, bedaubs his message on every fence, and he next arrives at the dignity of an equipage by which his wares are vended from town to town. Now the stage of more extended advertising is reached, and anon comes the period

of the inevitable almanac. This bait speedily brings more fish to the net, and the success of your medicine man may now be accounted certain.

Next we have the practitioner of medicine, whose avarice will not allow him to keep the legitimate channel. A very similar man is he to the druggist; but, by reason of his training, with enlarged capacity for rapaciousness; more specious and pretentious. In most countries, lapses of this kind are met with professional ostracism, but, in Canada, this is by no means an inevitable sequence; it does not, indeed, require any severe exercise of memory to recall instances of dealers and originators of bitters, female pills, and the like, who have been chosen to fill high official medical positions.

The itinerant quack, who has generally been a jack of all trades, may, to all intents and purposes, be considered an adventurer—to-day a book agent; next a doctor, haranguing the market crowd about the virtues of his lightning oil; and perhaps to-morrow explaining to a reluctant listener the intricacies of life insurance, after the irrepressible manner of his class This man is a comparatively harmless member of the fraternity; his business is generally of the most limited kind, and seldom do his changeful nature and often irregular habits permit him to continue long enough in any pursuit in order to meet with success. However, from these classes are the ranks of our patent medicine proprietors recruited. From these arise the mighty houses, wrapped in the impenetrable armour of wealth, which promulgate with impunity millions of lies, deceiving the ignorant, deluding the unwary, and preying on the lives of suffering humanity.

The question may be suggested,—if the patent medicine trade is as bad as this, how is it that the public give it such a willing support? they demand such medicines and must be satisfied. We answer, the public are educated, deluded and importuned into the belief; and, moreover, the class of persons affected, are either the sick or their sympathizing friends. A drowning man will catch at a straw, and when these so-called remedies are so speciously heralded, it is little wonder that the weary sufferer will grasp after a fancied relief; too often, indeed, to find that there is nothing in his hand.

For this popular delusion the press is chiefly to blame; seldom

can we take up a paper without finding some humbug blazoned forth and extolled ; generally by a self-blown trumpet, or at least by one whose every blast is purchased. Strangely enough these advertisements and puffs are mostly to be found in papers of a directly opposite character. Side by side with the pandering sentimentalism and filth of the vilest weekly, we find the column of quackery ; and do we search our religious organ, we find the holy and unholy strangely mixed together. The former often wages an unequal warfare with the latter, for the falsehoods of the nostrum vendor have generally the preponderance of space. Why these two classes of papers should be chosen we cannot tell, without it is that the advertisers assume the truth of the assertion that the world is made up of but two classes—the knave and the credulous.

The subject of our remarks has been suggested by a few hours ago receiving, from two unmitigated quacks, an offer of advertisements for this journal. One of these so-styled doctors would inform our readers that he is in possession of a certain cure for consumption and all diseases of the throat and lungs ; the other guarantees that by his medicine the epileptic will find sure and permanent relief. Either of these generous individuals will send to any one making the application, a trial bottle of medicine, free of charge. What the particular " dodge " in this instance is, we are not prepared to say, but there can be but one general conclusion—that it is a swindling operation of some kind, and from the extent of the advertising, that it is found to be a delusion of the most profitable description.

As to the means which should be used in order to check this rapidly increasing evil, we cannot do better than quote from an excellent article which appeared in one of the last numbers of the *Medical News :*

" Moral means are probably the only effective ones that are left open to be exercised in this country. It is incumbent, first of all that, physicians and surgeons should set their faces against the use of any quack nostrum, and this must be done without any appearance of self-interest. If we go into a house and find that some proprietary pills are being made use of as a family medicine, it will be well to advise the use of the compound rhubarb pill of the pharmacopœia, or some other suitable and legitimate medicine, which may be more cheaply obtained from a respectable druggist than the quack nostrum. In this quiet way much may be done by medical men themselves to check an evil from which undoubtedly they are

made to suffer. Then the clergy and the editorial and newspaper publishing prefessions have to be acted upon. Clergymen must be made to feel that their church organs are taking the devil's money in the pay of the quack advertiser; and that the position and influence of their religious newspapers are perverted by being made the vehicles of such advertisements. If once the true idea can be inculcated that quackery is cheatery and imposition, and of consequence neither honest nor respectable, and this idea be made to spread, as it ought to do, from the teachers of religion and morality, a great point will be gained.

"It will be more difficult to reach the newspaper publisher, who is of course much influenced by motives of gain, and whose income from advertising must necessarily be largely supplemented by advertising the quack medicines which figure so extensively in the newspapers. But here again the want of respectability must be made to attach to this class of advertising. Some newspapers will not advertise lotteries, partly because there is a law against it, and partly because it is obviously lending countenance to schemes that are often dishonestly managed; and the same odium should be made to attach to the flagitious puffs of the pill vendor.

"Another moral means which may be relied on for checking quackery is the cultivation of the higher and general knowledge of human physiology. The more intelligent we find any class of people, the more ready do we find that class to repose the fullest confidence in the educated and qualified practitioner. It is principally among the ignorant and less intelligent class that the love of quackery prevails. To these people medicine is medicine all the same whether it comes from the shop of a nostrum-vendor or the dispensing office of a medical man; and we can only hope to act upon such people by offering them a different example in the practice of their more intelligent superiors."

Our late contemporary is rather hard on the druggists, but we had, perhaps, better let him tell his own story.

"Lastly, and most hopeless class of all to operate upon, with the expectation of discountenancing the sale of proprietary medicines, we have the druggists. Although brought much in contact with them, physicians have confessedly little influence with druggists. The profits of the patent medicine trade are too great for druggists to relinquish this branch of their business on the mere recommendation of their patrons in the profession. The druggists have much to answer for. In league with the quacks, they often turn quacks themselves. Instead of maintaining cordial relations with doctors, there is too often ground for an antagonistic feeling. We are inclined to give up the druggists with a shake of the head as 'bad cases.' But let us hope that the druggists are not all bad, and that when ignorant and ill-advised people come to their shops

seeking relief for their ailments in a vaunted quack remedy some of these dealers will be found honest and disinterested enough to take a proper course in recommending their customers to go rather to a qualified practitioner."

In looking over our exchanges we are always pleased to notice any extract from this journal, and we are also gratified if any views we may have advanced meet with the indorsation of our contemporaries. There are, however, certain instances when a little more courtesy, and perhaps a little more honesty, might with advantage be shown. A case in point is that of the *Canada Medical Record.* In the February issue of that journal there appears as its first—and with the exception of some unimportant notes—its only editorial, a lengthy article which appeared in the editorial department of the January issue of this journal. In title and wording it is, as far as it goes, an exact copy, and is only different in having a short paragraph substituted for that concluding the original article. We are glad to find that the editor of the *Medical Record* holds opinions similar to our own, but think that in a case of this kind, a trifling acknowledgment of the fact would not be amiss.

Obituary.

T. N. R. MORSON.

At the time of our going to press with last month's issue we received notice of Mr. Morson's death, and we doubt not but most of our readers will by this time have learned of the sad event. Few names are better known, amongst druggists, than that of Mr. Morson, and the high reputation he attained, both as a man of science and thoroughly reliable manufacturer, will ensure a lasting and respectful remembrance. As editor of this journal we can speak of the many courtesies which we received from Mr. Morson, and remember with gratitude the substantial encouragement he tendered to an undertaking which, in common with others having for their object the advancement of pharmaceutical science, we believe he considered it a duty and pleasure to support.

For the following biographical notice we are indebted to the London *Pharmaceutical Journal* :—

"Mr. Morson was born at Stratford-le-Bow, in the eastern suburb of London, and received his early education at Stoke Newington. Having lost his parents while he was yet young, and being left without family guardian or connections, he was thrown to a great extent upon his own resources ; but he possessed within himself an endowment more valuable than worldly inheritance. With a mind remarkable for activity and power of perception he overcame the difficulties of his early life, became the founder of a business of world-wide reputation, and formed acquaintance, which ripened into intimate friendship, with some of the greatest chemists and philosophers of the age in which he lived. When only fourteen years of age he was apprenticed to an apothecary in Fleet Market (now Farringdon street), but he had no liking for medical practice, and therefore adhered to the pharmaceutical rather than the medical and surgical part of the business he was placed in. His predilection lay in the direction of chemistry, and this was probably favoured by the circumstance of his being thrown into association with men of kindred tastes, who formed a little society for the investigation of scientific subjects, and whose meetings were held in the neighbourhood of Fleet street. It was here he first made the acquaintance of Faraday, and acquired so strong a bent in favour of scientific chemistry, that he determined to make its application as far as possible the aim of his future pursuits. After the expiration of his apprenticeship he went to Paris, and entered the establishment of M. Planche, a pharmacien, with whom he lived for some years. He thus acquired a thorough knowledge of the French language as well as French pharmacy, and made the acquaintance of men whose friendship he cultivated in later years. He was still a young man when he returned to London and established himself in business as a chemist and druggist in the house in which he had been apprenticed, in Farringdon street, the late proprietor, Mr. Morley, having retired from the retail department, which was previously associated with his practice.

The chemist and druggist of those days was generally a chemist only by name, but not so Mr. Morson. In a little room at the back of his shop was produced the first sulphate of quinine made in England, and the same may be said of morphia. Nor were these operations merely experimental. From entries in his ledger it appears that he supplied sulphate of quinine to a wholesale druggist at eight shillings a drachm, and morphia at eighteen shillings a drachm. His chemical knowledge and manipulative skill were now bringing him into notice, and he was frequently applied to for rare chemicals ; but the premises in Farringdon street did not admit of the cultivation of this branch of the business, which was, neverthe-

less, the most congenial to his taste. We have heard him say that he would probably have hesitated for many years before engaging more extensive premises (for he was naturally cautious and very averse to speculation), had he not been encouraged and supported in that step by the lady to whom he had just then united himself in marriage, and who with much spirit and judgment added ample pecuniary means. He moved from Farringdon street to Southampton Row, and soon after purchased premises in Hornsey Road, where he built a laboratory for the manufacture of creasote, morphia, and other chemical products. We need not further trace his career as a chemical manufacturer, for in this capacity he is everywhere known, at least by name.

But Mr. Morson's fame has not been merely that of a manufacturer. He was a man of enlarged mind and cultivated intellect. Thrown upon the world in early life, with absolutely no relations, he was, nevertheless, surrounded by men of talent and high position, with whom he associated on terms of mutual friendshlp. He was a member and a regular attendant of the meetings of the Royal Institution, and a prominent member of the Society of Arts. His house was a place of resort for men of genius, where Graham and Fownes as chemists, Robert Brown, Bennett, Bowerbank, and Gray as naturalists ; Muller, Johnson, and Cruickshank as artists ; and Richard Horseman Solly and Captain Bagnold as patrons of science and art, with many others of kindred tastes, found hospitable reception and congenial associations. A Sunday evening in Southampton Row or Hornsey Rise often afforded an opportunity for the social intercourse of men such as those we have named, who found ample scope for the discussion of their favourite topics in Mr. Morson's company.

We have hitherto referred to a time when pharmacy in this country had not yet quickened from the embryo state of its existence prior to the establishment of the Pharmaceutical Society. When vitality began to be manifested among the previourly inert members of the disunited body with which Mr. Morson was associated rather by name than in character, it could not be supposed that he would be an inactive observer of what was passing around him. Accordingly, we find him in the foremost rank of those who originated the Pharmaceutical Society, and there was no one more frequently consulted, or whose opinion carried greater weight among his fellow-workers in the cause of pharmaceutical regeneration. He was constantly appealed to by his friend Jacob Bell on any difficult questions, and articles prepared for publication in the *Pharmaceutical Journal* were often submitted to him, and, to use an expression of Mr. Bell's, were frequently seasoned with the "Attic salt" from Southampton Row.

Mr. Morson, at this period, had an European reputation as a scientific manufacturing chemist, and his character in this respect,

together with his acquaintance with many of the scientific celebrities of the Continent, as well as his familiarity with the French language, enabled him to render great service to the young Society, in the development of which he took a lively interest.

Distinguished foreigners, attracted by the proceedings of English pharmacists, were generally entertained by Mr. Morson. French was almost as freely spoken as English, not only by Mr. Morson himself, but by the members of his family, who had received much of their education in France ; and here, therefore, might be found, when they were staying in London, those scientific foreigners who took an interest in pharmacy. Guibourt, Cap, Liebig, Mitscherlich, Rose, and many others of similar stamp, have been guests at various times at Southampton Row, Queen Square, or Hornsey, and have been indebted to Mr. Morson for an intimate acquaintance with the Pharmaceutical Society, its provisions and proceedings. Mr. Morson was for many years on the Council of the Pharmaceutical Society ; he was for a still longer period a member of the Board of Examiners, and he used to be a very constant attendant at the evening meetings of the Society. In 1844 he was elected Vice-President of the Society, and for four successive years he continued to fill this office, after which he was made President for a year, and again for about two years in 1859-60.

Mr. Morson retired from the Council of the Pharmaceutical Society in 1870, but his interest in the objects and operations of the Society remained undiminished, and up to the time his last severe illness commenced, he was almost a daily visitor at 17, Bloomsbury Square. His health, however, had sensibly failed for many months before his death, and he often expressed himself as sensible that his end was approaching. In the early part of January he had an attack of paralysis, from which he never recovered. Although he did not live to extreme old age, yet, we may say of him, that the work he was enabled to accomplish has entitled him to be classed among the most distinguished of the pharmacists of this country.

Editorial Summary.

Dispensing of Hydrocyanic Acid.—Mr. T. Baden Benger, (*Pharm. Jour. and Trans.*) notices various methods which have been proposed for the preservation and dispensing of prussic acid; and also alludes to the late suggestion of Mr. Towerzey—that a metallic cyanide be substituted for the more unstable liquid. This plan is a good one, but it would be some time before physicians could be brought to adopt it. For storing and dispensing the liquid acid the author suggested a simple contrivance which he had found quite satisfactory. It consists, in fact, of a bottle from which the contents may be removed without taking out the stopper. A small glass tube, shaped like the barrel of an ordinary half-ounce syringe, is drawn out to a rather long, fine point at one end, and sealed in the flame of a spirit lamp or Bunsen's burner; it is then filled with the acid and a piece of vulcanized sheet India-rubber tied *tightly* over the mouth. When required for use, the point is scratched with a file and broken off; by pressing the finger on the India-rubber diaphragm any required quantity of acid can be taken out, only the same bulk of air entering the tube when the pressure is removed. It is then placed, with its point below the surface of mercury, in a little upright glass vessel. By this method the only loss of HCN is the small quantity which diffuses in the air contained in the tube as it is gradually emptied, and is not sufficient to be of practical importance. It is of course necessary to bind the India-rubber tightly over the mouth of the tube, which should be of yellow glass, or varnished by a dip in solution of shellac coloured with coralline. Vulcanized India-rubber must be used, as the HCN diffuses rapidly through pure India-rubber. Not the slightest deterioration was found to have occurred in acid so kept for fourteen days. These tubes can be filled and sent out by wholesale houses instead of bottles, and can be as easily re-filled."

Combination of Chloral Hydrate and Camphor.—Mr. J. F. Brown, (*Pharm. Jour. and Trans.*) states some facts regarding the solution of camphor in chloral hydrate. When equal weights of these substances are triturated together a syrupy liquid is produced. A rise in temperature accompanies this change, showing that a chemical reaction of some kind must evolve more heat than sufficient to counterbalance the loss of sensible heat always attending the passage of a substance from a solid to the liquid state. No fumes are evolved. The mixture is unaffected by solution of silver nitrate; is

readily soluble in alcohol and ether; distilled water converts it into a soft translucent solid, with apparent separation of the constituents. Dr. Paul—editor of the journal above referred to—in referring to Mr. Brown's paper, says that some time since the *Medical Record* quoted from an American source a statement that if camphor be powdered by rubbing it in a mortar with a few drops of spirit, and an equal weight of chloral hydrate added, a liquid is produced which is a valuable local anæsthetic. Mr. Lennox Browne, writing to the *British Medical Journal* (March 7th, p. 304), confirms this statement, and says that it is of the greatest value as a local application in neuralgia. Mr. Browne having employed it during several months, has found great and sometimes instantaneous relief to follow its application in every case. It is only necessary to paint the mixture lightly over the painful part and allow it to dry. The application never blisters, though it may occasion a tingling sensation of the skin. The compound has also been found of great service in the relief of toothache.

Crystallized Glycerin.—In a paper read at a recent meeting of the Liverpool Chemists' Association, Mr. A. H. Mason described the properties and characteristics of crystallized glycerin, as exhibited by a specimen obtained from the patentee. The glycerine was first shown at the Vienna Exhibition, and it was then understood that this crystalline condition could only be insured by absolute chemical purity. From actual examination of a specimen, Mr. Mason thinks that this condition is not necessary to bring the specimen to the crystalline form in which it exists. Being very hygroscopic, atmospheric influence of mean temperature is quite sufficient to liquefy it, and, once liquid, exposure to intense cold will not cause it to congeal. The peculiar mousey odour is present. Contact with calcic oxalate produces slight turbidity, and heated with sulphuric acid and absolute alcohol there is discoloration. The method of production, being patented, is a secret; it commands a fancy price. Its usefulness is questionable; as a chemical curiosity it is interesting.

Diamond Powders for the Toilet.—A writer in the *Pharmacist* calls attention to a variety of this powder, now found in the market, which ought to be discountenanced. It consists of fragments of thin glass, with very sharp edges. The manufacture of this powder is very hurtful to the health, and workmen so employed require to take all the precautions which respirators and other similar contrivances afford. It may readily be

conceived that when this powder is plentifully dusted on the chignons, curls, and dresses of the ball-room belle, and the belle is set in motion amid the currents of the dance, that these fine particles are given off, much to the detriment of the lungs of the dancers. It is said that one death has already taken place from this cause. The other variety of diamond powder is, according to the author, composed of an inert mineral substance resembling tale, and is not nearly so injurious. The two varieties may be distinguished by throwing samples upon red hot coals; the powdered glass melts, while the mineral powder is unaffected. From a cursory examination of a specimen of one of these powders, sent to us for examination, some years ago, we concluded that it consisted of particles of the fine laminæ of mica, assorted by sifting.

Anæsthetic Properties of Saponin.—From the researches of Dr. Kohler, quoted in the London *Medical Record*, saponin is possessed of marked powers as a local anæsthetic, so that it is possible that it may be yet of service in surgical operations. A solution of saponin, applied externally, produces partial paralysis of the motor and sensory nerve filaments; administered hypodermically, these effects are realized to a greater extent. Saponin exists in many plants, as in the Silenæ—*Saponaria officinalis:* Polygalaceæ—*Polygala senega:* and Sapotaceæ—Cortex monesiæ, a product of the *Chrysophyllum glycyphlœum.*

Adulteration of Sherry.—Of nineteen samples of sherry—eight of them of the highest quality to be procured in the London market—analyzed by Dr. Hassall, not one was to be found the pure and unadulterated product of the grape. All of them contained a heavy percentage of spirit, such as could not have resulted from the fermentation of the juice of the grape, and seventeen of them gave evidence of large quantities of sulphate of calcium.

Transactions of Pharmaceutical Colleges and Societies.

MONTREAL COLLEGE OF PHARMACY.

The monthly meeting of this College was held on Thursday evening; Mr. H. R. Gray, President, in the chair, and Mr. Harper, in the absence of Mr. Mattinson, acting as Secretary. A donation of two bound volumes of the "Chemist and Druggist," was announced. Dr. A. H. Kollmyer, of the medical faculty of Bishop's College, delivered a very interesting lecture on "Electrolysis." The lecturer before entering upon his subject gave a short history of Electricity itself. He said that the term Electricity is derived from a Greek word, *Elektron*, signifying amber, because it was first noticed by the ancients in that substance, and we are told that Thales of Miletus spoke of this property in amber 600 years before the Christian era; but that no further progress was made concerning it till the beginning of the last century, when new and important facts were discovered relating to it, and that these attracted general attention among philosophers and speedily acquired for it the regular form of a science—a science, indeed, which has since been applied to so many useful and ornamental purposes, and also one which has served in a manner almost to annihilate time and distance, as exemplified in the telegraph.

He then entered upon the discussion of the true nature of electricity, which he defined to be one of the forms of force, and he demonstrated by experiments and diagrams how electricity could be converted into heat, light and the other forms of force, and how it could not only produce motion, but how motion could also produce electricity. He afterwards entered into a description of the three forms of electricity: 1. That excited by friction; 2. Magnetism; 3. Galvanism. He explained the theory of thunderstorms, and described the effects of lightning and of galvanism on both living and dead animals. He described fully the component parts of the various galvanic and voltaic batteries, or piles, as well as magnets, and by numerous brilliant and instructive experiments he was enabled to decompose water and effect other chemical changes and decompositions in bodies. He then spoke of the numerous discoveries of metals by Sir Humphrey Davy by the aid of this means of decomposition; that this philosopher had proved that potash, soda, lime, &c., were not the simple bodies that they had up to that time been regarded, but that they were in reality compounds of potassium, sodium, calcium, &c., with oxygen gas, whose disunion he effected

by electrolysis. Through its instrumentality chemists have been enabled to become acquainted with the true nature of the many other elementary bodies, and new fields have opened up for investigation, and he felt certain that new and important discoveries will yet be made. The study of electricity in its different forms, he remarked, had charms and attractions about it scarcely possessed by any other branch in science, and most undoubtedly unsurpassed by any in the brilliancy, variety, grandeur, as well as in the utility and usefulness of the results. The experiments throughout were of the highest order, most interesting and instructive, and the lecturer concluded by thanking Dr. Shaw and Mr. Anthony Kerry for their assistance in enabling him to demonstrate the various points under consideration.

A vote of thanks, proposed by Mr. Mercer, and seconded by Mr. Saunders, was given to the lecturer and the meeting then adjourned.

This meeting concludes the monthly meetings of this session. It was a subject of remark that the unnecessarily late closing of the drug stores kept many young men from availing themselves of these lectures.

The generality of clerks in the drug business, are sadly wanting in scientific training, and it is astonishing that those who are so fortunate as to hold situations in the two great centres of Canada, do not make greater exertions to avail themselves of the excellent opportunities presented to them for improvement. We have seen the grossest ignorance of scientific facts displayed by assistants in some of our leading pharmacies, which, were we to expose in these columns, would almost dishearten those amongst us who are working and hoping for a better state of things.

Practical Formulæ

Dark Brown Hair Dye.—The following is a good dye:

No. 1.

℞ Acid. Pyrogallic..... gr iv.
Aq. Destill ..... ℥ij.
M.

No. 2.

℞ Arg. Nit. Cryst..... ..... ℥j.
Gum. Acaciæ ..... ℥j.
Aq. Destill .... ℥ij.
M. s. a.

—*Pharm. Jour. and Trans.*

Lubricator.—Stir together at a boiling heat one litre petroleum, 88 grams graphite, 3 grams beeswax, 9 grams tallow and 3 grams caustic soda.

Glycerine and Cantharides Lotion.—

Rosemary water	One Pint.
Aq. Ammonia	One Drachm.
Tincture Cantharides	Two Drachms.
Glycerine	One half Ounce.

To be used with a sponge or soft hair-brush twice a day.

Registrar's Notice.

THE REGISTER OF THE ONTARIO COLLEGE OF PHARMACY.

As the period of closing the Annual Register of the College is approaching, the Registrar takes the opportunity of reminding those members who have not already sent in their registration fee for 1874, that it is prescribed by the Act that all Chemists and Druggists in business shall, on the first day of May, pay to the Registrar the sum of four dollars; and also that, on the fifteenth day of June of each year, the Registrar shall cause to be printed and published an alphabetical list of the members who were, on the first day of June of that year, entitled to keep open shop as Pharmaceutical Chemists.

The primary object of the Register is to confer a distinction upon persons duly qualified for the business of a pharmaceutical chemist. The first condition, therefore, is the possession of the requisite qualification, either proved by passing the prescribed examination, or (in the case of the original members) implied by the recognition of their position in the business upon their own account, or in partnership with any other person, or as having served an apprenticeship of three years and acting as a druggist's assistant for one year prior to the 15th February, 1871. The other condition—without which the College could not continue to exist, and which is, therefore, sanctioned in the Act—consists in the payment of the fees and subscriptions as required by section 17 of the Pharmacy Act.

It is hoped every member will see the importance of having his name inserted in the Annual Register which is to be published in June. The absence of their names from the Register of the Society deprives them of the right to assume the name of Pharmaceutical Chemist, or to use any name, title, or sign implying that they are identified with the College. It is proper to remind those who exclude themselves from these privileges, that they will, in all probability, have cause to regret their lukewarmness by having to pay the penalty for infringement of the Act.

The College is increasing its influence, and is becoming known and recognized by the public. New members are coming forward, and, by passing the examination, are raising the standard of qualification, which reacts upon the character of the College, increasing the value of membership. Every member, therefore, who takes an interest in the profession will do his best to forward the cause the Council have at heart—viz., the founding of a College for the better education of the future chemists and druggists of the Province of Ontario.

Drugs, Medicines, &c.	$ c.	$ c.
Acid, Acetic, fort	0 15 @	0 16
Benzoic, pure	0 23	0 30
Citric	1 40	1 50
Muriatic	0 05	0 06
Nitric	0 11½	0 15
Oxalic	0 28	0 30
Sulphuric	0 03¾	0 07
Tartaric, pulv	0 50	0 50
Ammon, carb. casks	0 23	0 24
" jars	0 23	0 24
Liquor, 880	0 25	0 28
Muriate	0 14	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 35	0 37
Sulphuric	0 50	0 50
Antim. Crude, pulv	0 15	0 17
Tart "	0 55	0 65
Alcohol, 95 per ct.....Cash	1 95	2 05
Arrowroot, Jamaica	0 18	0 22
Bermuda	0 50	0 65
Alum	0 02¾	0 03½
Balsam, Canada	0 50	0 50
Copaiba	0 95	1 00
Peru	3 75	4 00
Tolu	1 15	1 20
Bark, Bayberry, pulv	0 20	0 22
Canella	0 17	0 20
Peruvian, yel. pulv	0 42	0 50
" red "	2 10	2 20
Slippery Elm, g. b	0 15	0 20
" flour, packets	0 28	0 32
Sassafras	0 17	0 20
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	30 00	30 00
Bismuth, Alb	3 30	4 00
Carb.	3 50	4 00
Camphor, Crude	0 38	0 40
Refined	0 45	0 50
Cantharides	2 40	2 50
Powdered	2 60	2 70
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 23	0 30
Chloroform	1 10	1 65
Cochineal, S. G	0 75	0 90
Black	1 10	1 20
Colocynth, pulv	0 60	0 65
Collodion	0 70	0 80
Elaterium.....oz	3 20	4 00
Ergot	0 32	0 45
Extract Belladonna	1 50	1 60
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	0 00	0 95
Henbane, "	1 50	1 60
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic.....oz	0 40	0 50
Opium .....oz	1 50	
Rhubarb	5 00	5 50
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	3 50	4 00
Taraxacum, Ang	0 70	0 80
Flowers, Arnica	0 17	0 25
Chamomile	0 32	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 40	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
Socot	0 50	1 35
" " pulv	1 00	0 00
Arabic, White	0 70	0 75
" powdered	0 60	0 75
" sorts	0 24	0 30
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 40	0 42
British or Dextrine	0 13	0 15
Benzoin	0 35	0 75
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 35	0 40
Gamboge	1 40	1 50
Guaiacum	0 95	1 00
Myrrh	0 50	0 85

Drugs, Medicines, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	0 70
Scammony, powdered	6 00	6 50
" Virg. "	14 50	—
Shellac, Orange	0 90	1 00
Gum, Shellac, liver	0 80	0 90
Storax	0 40	0 45
Tragacanth, flake	1 10	1 75
" common	0 53	0 65
Galls	0 22	0 30
Gelatine, Cox's 6d	1 15	1 20
Glycerine, common	0 25	0 30
Vienna	0 29	0 30
Prices	0 60	0 75
Honey, Canada, best	0 16	0 17
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon	1 75	1 80
" & Quinine, oz	0 60	0 62
" & Strychine	0 20	0 25
Sulphate, pure	0 08	0 10
Iodine, good	6 75	7 00
Resublimed	7 50	8 00
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 32
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I.	0 14	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 17
Lime, Carbolate.....brl	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12
Lead, Acetate	0 15	0 16½
Leptandrin.....oz.	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 75	2 00
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb. 1 oz.	0 20	0 25
" 4 oz.	0 17	0 20
Calcined	0 65	0 75
Citrate.....gran.	0 63	0 75
Mercury	1 85	1 90
Bichlor	1 70	1 75
Chloride	1 90	2 00
C. Chalk	0 75	80
Nit. Oxyd	1 90	2 00
Morphia Acet	4 60	4 75
Mur.	4 60	4 75
Sulph.	4 80	5 00
Musk, pure grain.....oz	25 00	—
Canton	0 90	1 20
Oil, Amonds, sweet	0 40	0 45
" bitter	14 00	15 00
Aniseed	4 00	4 25
Bergamot, super	6 50	6 50
Caraway	3 20	3 50
Cassia	2 50	0 00
Castor, E. I	0 16	0 18
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 15	1 25
Cloves, Ang	3 00	3 00
Cod Liver	1 05	1 50
Croton	1 75	2 00
Juniper Wood	0 80	1 00
Berries	6 00	7 00
Lavand, Ang.....oz.	0 90	1 00
Exotic	1 40	1 60
Lemon, super	4 60	5 75
ord	3 20	3 40
Orange	5 25	5 50
Origanum	0 65	0 75
Peppermint Ang	15 00	16 00
" Amer	5 00	5 50
Rose, Virgin	8 50	8 75
" good	6 80	7 00
Sassafras	0 75	1 90
Wintergreen	6 00	6 50
Wormwood, pure	4 00	6 00
Ointment, blue	1 30	1 50
Opium, Turkey	8 25	8 04
pulv	10 00	10 55

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass	1 30	1 40
Potash, Bichrom	0 23	0 27
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 2	0 65
Nitrate	10 50	11 00
Potassium, Bromide	1 00	1 10
Cyanide	0 65	0 70
Iodide	5 75	6 25
Sulphuret	0 25	0 35
Pepsin, Boudault's...oz	1 40	—
Houghton's..... doz.	8 00	9 00
Morson's...oz.	0 85	1 10
Phosphorous	0 95	1 00
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 40	—
" 100 oz. case.	2 35	—
" 25 oz. tin..	2 35	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 08	0 10
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	1 50	1 60
Jalap, Vera Cruz	90	1 15
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 50	2 75
" E. I	1 10	1 20
" " pulv	1 20	1 30
" " 2nd	0 90	1 00
" French	0 75	—
Sarsap., Hond	0 40	0 45
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 10	1 20
Spigelia	0 25	0 30
Sal., Epsom	2 25	3 00
Rochelle	0 32	0 35
Soda	0 02½	0 03
Seed Anise	0 13	0 16
, Canary	0 05	0 06
Cardamon	2 25	2 50
Fe ugreek, g'd	0 09	0 10
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	1 00	1 10
Spanish	12 00	13 00
Santonine	7 50	8 00
Sago	0 08	0 09
Silver, Nitrate.....Cash	14 85	16 50
Soap Castile, mottled	0 11	0 14
Soda Ash	0 03½	0 05
Bicarb. Newcastle	—	6 50
" Howard's	0 14	0 16
Caustic	0 05½	0 05¾
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 25	2 50
Sulphur. Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 75	0 80
Zinc. Chloride.....oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Aniline, Magenta, cryst	2 50	2 80
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09½	0 10
Camwood	0 06	0 09
Copperas, Green	0 01¾	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02½	0 04
Indigo, Bengal	2 40	2 50
Madras	0 90	0 95
Extract	0 30	0 35

DYESTUFFS—*Continued.*		
Japonica	0 07¾	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 02½	0 03
Logwood, Camp	0 02¼	0 3¾
Extract	0 10	0 14
" 1 lb. bxs	0 13	—
" ½ lb. "	0 14	—
Madder, best Dutch	0 13	0 15
2nd quality	0 12	0 14
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 11½@	0 12
Cassia	0 39	0 40
Cloves	0 46	0 48
Cayenne	0 28	0 30
Ginger, E. I	0 19	0 20
Jam	0 20	0 30
Mace	1 65	1 75
Mustard, com	0 20	0 25
Nutmegs	1 15	1 20
Pepper, Black	0 22½	0 23
White	0 48	0 50
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07½	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 07	0 08
Umber	0 07	0 10
Vermillion, English	1 85	1 90
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen	0 08¼	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
Zinc White, Star	0 10	0 12
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 11	0 12
Putty	0 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 50	—
" No. 1	2 25	—
" No. 2	2 00	—
" No. 3	1 75	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	5 00 @	5 25
Rosin, Strained	4 50	—
Clear, pale	7 80	—
Spirits Turpentine	0 62	0 65
Tar Wood	5 50	5 75
OILS.		
Cod	0 63 @	0 70
Lard, extra	0 85	0 90
No. 1	0 75	0 80
No. 2	0 72	0 75
Linseed, Raw	0 75	0 80
Boiled	0 80	0 85
Olive, Common	1 10	1 20
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 70	0 70
Straw	0 68	0 70
Sesame Salad	1 30	1 35
Sperm, genuine	2 30	2 40
Whale refined	0 90	0 95