AMERICAN JOURNAL OF PHARMACY
Volume 53, #6, June, 1881

Botanical Medicine Monographs and Sundry

SANGUINARIA CANADENSIS.

BY FRANK L. SLOCUM, PH.G.

From an Inaugural Essay.

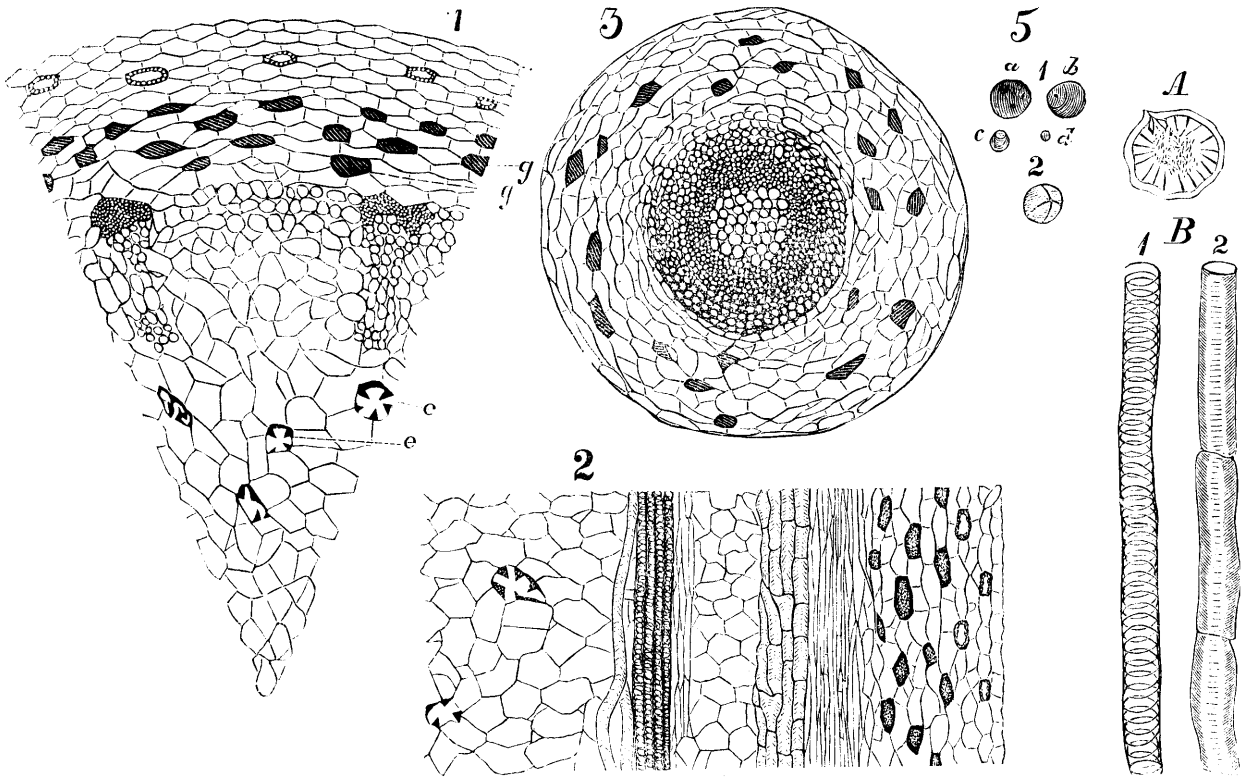
The microscopical structure of the rhizome of Sanguinaria has not yet, to my knowledge, been figured, and is only briefly mentioned by De Bary in his "Vergleichende Anatomie," p. 209, 450. Hence a microscopical examination has been made.

Fig. 1 represents a cross-section of the rhizome, showing the general arrangements of the fibrovascular bundles which are situated in a double circle three-fourths of the distance from the center to the exterior.

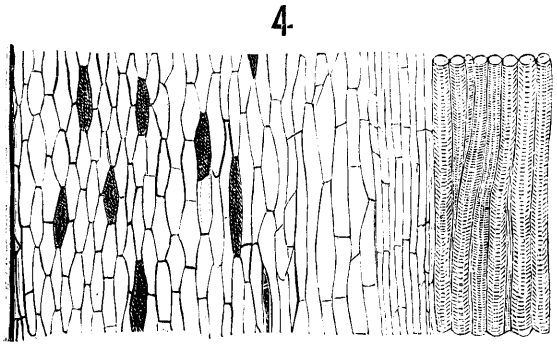
Outside of the xyleme the parenchyme is rather compressed; the 8 or 10 external rows of cells are generally quite devoid of starch, and contain a few resin cells, *gg*. The fibrovascular bundles in the outer circle are composed of about 12 vessels each, shortly jointed, and their course is exceedingly difficult to trace. They are all of one class, namely, pitted vessels; the sieve tubes are few, and nearly all situated in the outer portion of the fibrovascular bundles. The fibrovascular bundles in the inner circle are smaller, the vessels are longer and their course is quite easily traced; the sieve tubes are in the same position as in the outer row of bundles.

Inside of the circle of fibrovascular bundles, and between them, is loose parenchyme, filled with starch; the large cells, *ee,* containing the red juice, are shown with the juice dried and adhering to the cell walls.

According to De Bary, (*loc. cit*.), laticiferous ducts are absent in the Sanguinaria, having in tlieir place large thin-walled cells, filled with red juice. In only one specimen out of nearly 50 examined were found spiral ducts in the rootlets and inner circle of the fibrovascular bundles.



SANGUINARIA CANADENSIS.—*A* Transverse section of rhizome, natural size. *B* Ducts: 1. spiral; 2. dotted. 1. Rhizome, transverse section, magnified. 2. Rhizome, longitudinal section, magnified. 3. Rootlet, transverse section, magnified. 5. Starch granules, highly magnified.



SANGUINARIA CANADENSIS.—4. Rootlet, longitudinal section, magnified.

Fig. 2 represents a longitudinal section of the rhizome, the structure of which may be understood from the above explanation of the cross-section.

Fig. 3 represents a transverse section of a rootlet; the vessels are seen to be closely aggregated in the center, surrounded by sieve tubes, which, as they become more removed from the vessels, are of somewhat, but slightly, increased diameter. Outside of the nucleus sheath the structure consists of parenchyme, flattened and elongated, and containing resin cells.

Fig. 4 shows a longitudinal section of a rootlet, wdiich is understood by the above description of the transverse section.

Fig. 5 shows the starch granules highly magnified, probably two-thirds of the granules being of the size of 1-*ab*, while the remainder are of the size 1-*cd*.

The grannie 1-*a* measures 6.022 mm., while the smallest granules measured 0.0032 mm. 2 shows the appearance of a granule under polarized light.

A represents a transverse section of rhizome, of natural size.

B 1 and 2 represent two ducts much magnified, 1 being a spiral duct from a rootlet, 2, a dotted duct from the rhizome.

The external layer of cells in both rhizome and rootlet do not differ materially from the others, being only slightly flattened.

Chemical Examination.—Four pounds (avd.) of carefully selected rhizome were reduced to powder No. 50 and exhausted with stronger alcohol; the alcohol was removed by distillation, leaving a soft dark red extract, weighing $^{3}/_{4}$ pound (avd.). The extract was then mixed with half a gallon of acidulated water (water 48 parts, acetic acid 1 part), which precipitated the resin, leaving a blood-red solution; the resin was removed by nitration, and thoroughly washed with distilled water, in which it is nearly insoluble, dried and weighed; the yield was 985 grains of resin, (a); the filtrate was marked (6).

Examination of Resin (a).—The resin is of a dull pale red color, slightly sternutatory, has an acrid taste, and is of waxy consistence. An examination was made by the following scheme to ascertain its nature:

The resin was dissolved in boiling alcohol and the solution cooled, when a precipitate was formed; separated by a filter.

Filtrate.

Treated with alcoholic solution of acetate of lead, which produced a slight brown precipitate; separated solution from precipitate by filtering.

Precipitate.

Is not absolutely insoluble in cold alcohol.

Filtrate

Treated with ammoniated alcohol, gave a light brown precipitate, which was separated by filtration.

Precipitate.

Suspended in alcohol, decomposed by H_2S & filtered

Filtrate

Treated with H_2S and filtered from the lead sulphide.

Precipitate

Suspended in alcohol, and decomposed by H_2S; filtered.

Filtrate.

Yellowish brown; evaporated to dryness gave a very small amount of a brown-red resin; sparingly soluble in ether

Precipitate.

Black PbS, containing very little coloring matter.

Filtrate.

Evaporated nearly to dryness, gave a red resin, dissolving in cold alcohol, and having the same properties as the crude resin.

Precipitate.

Black lead sulphide; some little coloring matter; is precipitated with it.

Filtrate.

A light straw-colored liquid; evaporated to dryness; minute residue.

Precipitate.

Black PbS, containing little coloring matter.

By treatment with hot alcohol and cooling, about one-tenth of the resin is precpitated as a dull brown pulverulent substance (*x*), slightly inclined toward a grey-brown color. The resin (*y*) that is soluble in cold alcohol, is of a bright red color, extract-like consistence, has a, slight taste, and colors the saliva Their behavior to solvents, etc., was found to be as follows :

	Ether.	*Chloroform.*	*Water.*	*Carbon Disulphide.*	*Benzol.*
Resin (*x*)	Spar. soluble, hot or cold.	Spar. soluble, hot or cold.	Sufficient to color only, hot or cold.	Spar. soluble, hot or cold.	Spar. sol. hot; less sol. cold.
Resin (*y*)	Very spar. sol. hot or cold.	Soluble, hot or cold.	Scarcely colors, hot or cold.	Soluble hot, spar. soluble cold.	Soluble hot, spar. soluble cold.

	Gasolin.	*Caustic Potassa Sol.*	*Ammonia.*	*Hydrochloric Acid.*	*Incineration.*
Resin (*x*)	Spar. soluble, hot or cold.	Spar. sol. hot; less sol. cold.	Very spar. sol. hot or cold.	Soluble hot, spar. soluble cold.	No ash.
Resin (*y*)	Insoluble, hot or cold.	Sufficient to color, hot or cold.	Spar. sol. hot, insol. cold.	Soluble hot, spar. soluble cold.	Ash.

The resin (*a*) was examined for protocatechuic acid as follows: Equal parts of the resin and solid caustic potassa were heated together in a silver dish until completely fused. The dark colored fused mass thus obtained was dissolved in water, the aqueous solution rendered slightly acid by sulphuric acid, and filtered; the yellowish-colored filtrate was then agitated with ether until it ceased to take up any more soluble matter; the ether was then separated and evaporated spontaneously, furnishing a small amount of crystals, which gave with ferric chloride a bright emerald-green color, and on the subsequent addition of a weak solution of potassium hydrate a bright crimson-red color was produced, making it quite conclusive that protocatechuic acid was formed by the above treatment.

Resin (*x*) gave the same indications for protocatechuic acid when similarly treated.

Examination of Resinous Precipitates in Tincture, etc.—The precipitates formed in the liquid preparations of Sanguinaria on standing were also examined to ascertain whether sanguinarina was carried down with the resinous matter. Messrs. Bullock & Crenshaw, and Wm. R. Warner & Co., very kindly furnished me with sufficient quantities of the precipitate from the tincture and fluid extract, which were examined as follows: The drained precipitate was thoroughly washed with a mixture of alcohol 3 parts, water 1 part, and then boiled with acidulated water (water 15 parts, acetic acid 1 part), filtered, thus separating the resin and giving a dark red nitrate. The nitrate when rendered alkaline with ammonia gave a purplish precipitate; the precipitate was washed and dissolved in ether; hydrochloric acid gas was then passed into the

ethereal solution till no further precipitation occurred. A dense bright red precipitate of hydrochlorate of sanguinarina was produced, and a comparatively large quantity for the amount of precipitates employed from both the tincture and fluid extract. Hence the precipitates in liquid preparations of Sanguinaria contain notable quantities of the alkaloid sanguinarina. None of the solvents used or tried would prevent this gradual precipitation; alcohol, however,, proves to be far the best solvent, and not only holds the sanguinarina and resin in solution, but it extracts the resin more completely from the drug.

Properties of the Resin.—In doses of from two to four grains it is a nauseant, reducing the pulse and producing uneasiness in the stomach., In the "Proceedings of the American Pharmaceutical Association" for 1863, page 214, the late Prof. R. P. Thomas gives an exhaustive article on the active principles of Sanguinaria and their therapeutical value. In speaking of the resin he says: "The alkaloid sanguinarina is certainly the most valuable principle existing in bloodroot, but I am persuaded it is not the sole agent, as some trials made with the impure resin show that the latter also possesses nauseant and emetic properties." The examination made on the resin tends to corroborate this statement.

Examination of Filtrate (*b*).—To four fluidounces of the filtrate solution of acetate of lead was added, which gave a precipitate of a reddish-purple color.

Precipitate.	*Filtrate.*	
Suspended in water, and decomposed by H_2S, filtered, gave a dark red solution; evaporated to extract consistence, was found to consist of a gummy red coloring matter, *uncrystallizable*.	Treated with subacetate of lead; dense brown precipitate, filtered.	
	Precipitate.	Filtrate.
	Suspended in water, decomposed by H_2S and filtered; brown-red solution; evaporated, left gummy extract; proved to be coloring matter.	Light red color; containing the alkaloids, etc.
Inert.	Inert.	

There seem to be two coloring principles besides the resin and sanguinarina ; the one precipitated by normal acetate of lead, the other by basic acetate of lead.

The whole of the filtrate b was then rendered alkaline with ammonia, and the precipitated sanguinarina separated by filtration. The red-brown filtrate was evaporated to an extract and washed with stronger

alcohol until this would take up no more (large doses of the residue left after this washing were taken, but proved to be inert). The alcoholic solution was of a dark red color, and contained much glucose, as proven by Trommer's test, the behavior to alcohol and ether and by its sweet taste. The alcohol was evaporated, leaving a sweetish brown-red extract, which was dissolved in water rendered alkaline with potassa, and agitated with ether; the ethereal solution was allowed to evaporate, when it deposited prismatic needle-shaped crystals, colorless, of a very slightly bitter taste, possessing an alkaline reaction, and forming with acids colorless solutions and producing precipitates with solutions of mercurio-potassic iodide and iodine in iodide of potassium. This colorless alkaloid exists in a very minute quantity in the rhizome. With sulphuric acid it gives a beautiful dark purple color, which is not permanent, and changes to a yellowish color after the addition of potassic bichromate. The alkaloid was first isolated by Riegel, in 1845, and its reaction with sulphuric acid was noticed by F. W. Carpenter (see “Amer. Jour. Phar.” 1879, p. 172).

The aqueous solution left after washing with ether was found to be inert in large doses. Therefore the medicinal principles are the sanguinarina, resin and perhaps to some extent the second alkaloid. The resin has an effect similar to that produced by the alkaloid, only not in so marked a degree.

CONSTITUENTS OF FRASERA WALTERI.

BY GEORGE W. KENNEDY.

In the early part of last year (1880) I received from my friend, Mr. J. U. Lloyd, of Cincinnati, Ohio, a small quantity of powder of a lemon-yellow color, which he obtained from the root of American Colombo, with the request that I examine it carefully, as he was under the impression it was identical with that isolated by me from the root of *Frasera Walteri* in 1873 (“Proc. Am. Phar. Asso.” 1873, p. 636). Later in the year I received another small quantity by mail from the same gentleman.

In appearance the powder or very small crystals, which they appeared to be, were of the same light yellow color, and very much resembled those obtained by the writer. They were submitted to the same tests as those which were obtained by myself, and their behavior corresponded

precisely, again proving conclusively, for the second time, that the root of American Colombo contains constituents identical with those of *Gentiana lutea*, and that the two roots are closely analogous; the only difference I was able to discover was that the frasera contained more of the yellow acid (gentisic acid), and the gentian more of the bitter principle (gentiopicrin).

The substance obtained from Mr. Lloyd was submitted to additional experiments. With ferric chloride it produces a deep green-black color, and in this respect is similar to that obtained by Prof. Maisch from the root of gentian ("Am. Jour. Phar.," 1880, p. 1-4). It is the same substance which led a number of pharmacists to believe that gentian root contained tannin. When treated with a solution of gelatin a very delicate precipitation was observed after standing about 8 hours. The substance was found to be decidedly more soluble in hot water than cold, the former producing a pronounced lemon-yellow solution, whilst in the latter the water was hardly tinged.

POISONING BY ANACARDIUM OCCIDENTALE.

BY HENRY FISHER.

The writer, while engaged in making an acetic extract of anacardium occidentale, in which he was obliged to use heat with the object of reducing a liquid extract of said drug to a solid consistence, met with the following severe experience.

As there was no draught of air to dissipate the fumes as they arose during the process of the manufacture, the operator necessarily being subjected to them, was unconsciously receiving their effects in the parts of his face and neck that were exposed; this transpired in the afternoon. The first evidence of ill effects that he experienced was a slight itching, attended by a burning sensation on touching the forehead, which occurred during the night after he had retired. Upon rising in the morning, not imagining any ill-effects from the experience of the afternoon previous, he was at a loss to account for the condition in which he found his head, which appeared to be in an indefinable abnormal state. Upon gazing into a mirror, it was found that the forehead and the surface surrounding the right eye were so swollen and inflamed as to interfere with the sight of that organ of sense, the left

being but slightly swollen. He continued his daily avocation under much difficulty, owing to the pain and swelling of the face, which continued to grow more intense each moment, until at last towards the close of the day he was obliged to appeal to a neighboring physician for advice, as his face had become so swollen as to almost obscure the sight. It was thought, as the nature of burns was acid, that an alkali would obviate the trouble. This was accordingly promptly resorted to in the form of bicarbonate of sodium. After a half hour's intense pain from this treatment, with no perceptible effect further than to excite the inflamed parts, it was relinquished, and, on the physician's advice, cloths saturated with cold water were applied during the remainder of the evening, affording slight relief. It the morning it was deemed expedient to use a solution of acetate of lead and water. Accordingly, the parts affected were bathed, and cloths saturated with the solution were applied frequently. The effect of this treatment was transient, and only existed while the surface was moistened with the solution, affording relief and tending to check further inflamation and swelling. The next morning the eyes were closed, and the swelling, together with the inflammation, had extended to the covering of the whole surface of the face and neck, with great prospects of extending further. The physician, apprehending serious-effects if the spreading of the poison was not checked, considered that vigorous treatment was absolutely necessary, hence the resort to painting the face and neck with tincture of iodine, the application of which produced excruciating pain. The poison now, for the first time, received its check, and, by frequent application, the swelling gradually-subsided, and the inflammation, together with the redness attendant on it, grew less until, in the course of two or three days' treatment, the injured parts were restored to a normal condition, with the exception of the old skin peeling off in fragments in yielding to the new skin which was forming.

The writer submits the above with the hope that others who have not had any experience with the above drug might profit from his experience and use the necessary precautions, and those who through misfortune might become similarly situated might profit from the result of the treatment in his case.

Philadelphia, May, 1881.

NOTE BY THE EDITOR.—It is well known that the dark colored oily juice of the pericarp of the cashew nut produces a very painful and

persistent eczematous eruption, due to *cardol*, which was isolated by Staedeler in 1847 as a yellowish oil, having, on heating, a faint, agreeable odor. Although cardol is stated not to volatilize without decomposition, yet the vapor arising during the roasting of tlie cashew nut is apt to cause severe and painful inflammation and eruption unless great caution is used. This would seem to indicate that by the aid of other vapors cardol is partly volatilized.

Little is known concerning the chemical behavior of cardol, but since its solution is not precipitated by pure lead acetate this salt will probably be of little service against the effects of cardol. Basic acetate of lead seems to promise better results, at least in the earlier stages of cardol poisoning, since this compound produces, with cardol, a white precipitate which, on exposure to the air, rapidly acquires a reddish and red-brown color.

It is worthy of note that, according to Buchheim, three or four drops of cardol may be swallowed without producing any marked effects; but it should also be remembered that the crude oil applied to the lips produces, in a very short time, very painful blisters.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Curare of French Guiana.—Mr. Crevaux states that the following-plants enter into tlie preparation of the curare of the Upper Parou. The principal one is called ourari, and is a new species of Strychnos, named by Planchon St. Crevauxii. The Indians soak the roots, remove the bark with a cutting instrument, and express the juice with their hands. The juice, added to some other unimportant substances (among others a capsicum), is very slightly heated and dried in the sun. The juice of the roots is very bitter and stains the hands brown like tincture of iodine; it may be handled with impunity, provided there are no excoriations.

The accessory plants used in preparing this curare all belong to the piperacese, namely, 1, *alimieré*, an undetermined piper; 2, branches agreeing tolerably well with specimens of *Piper lætum*, C. D. C., s. *Ottonia læta*, Kunth; 3, *potpeu*, which approximates to *Piper Host-mannianum*, C. D. C., s. *Artanthe ramiflora*, Miq.; and 4, *aracoupani*,

an undetermined piperacea.

The juice of *Hura crepitans*, Lin., which Mr. Crevaux collected on the banks of the Amazon, near to the mouth of the Parou, is used to poison arrows; the species bears the name of ouassacou.—*Phar. Jour. and Trans*., Feb. 19, 1881, p. 693.

Curare of British Guiana.—The principal species used for the preparation of this curare is *Strychnos toxifera*, Benth., the *urari* of the natives; also *arimaru*, which is *Str. cogens*, Schomb., and *yakki*, the *Str. Schomburgkii*, Klotzsch, s. *Str. pedunculata*, Benth., s. *Rouhamon pedunculatum*, A. D. C. The juices of five other plants, known as *volkarimo, tarireng*, *tararemer*, *mamica* and *maramu*, are used to thicken the curare.—*Ibid*., March 12, p. 754.

New African Arrow Poison.—Rob. W. Felkin has sent to Dr. Ringer an arrow poison, which is used on the east coast of Africa, between Zanzibar and the Sourali Land, and is made by the Wanika and Wakamba tribes, who live to the west of an island called Mombasa. Extracts are made from eleven different roots; the poison is a black extract, of firm consistence, and almost odorless A. W. Gerrard believes that tlie chief ingredient of the new poison is a *Strophanthus*, either *S. hispidus* or *S. Kombé*, nat. ord. Apocynacese, thus closely allied to the genus Strychnos. Dr. F. R. Fraser, in 1872, investigated the seeds of an African strophanthus, and found it to be a powerful paralyzing agent and cardiac poison.

The new poison which, in the absence of a name, is called *wanika*, after one of the tribes using it, was found by Gerrard not to contain an alkaloid; it contains a tannin, precipitating ferric salts blueish-green, and a glucoside, which was prepared by diluting the alcoholic extract with water, filtering, precipitating with basic lead acetate, filtering, removing excess of lead by sulphuric acid, evaporating, treating repeatedly with a mixture of chloroform and alcohol to remove glucose, and evaporating. The principle is neutral, amorphous, pun-gently bitter, soluble in alcohol and water, insoluble in ether and chloroform, yields with strong sulphuric acid a sliglit brown color, and when heated with soda lime evolves ammonia; with Fehling's solution it gives no reduction till boiled with a dilute acid.

Dr. Ringer found this arrow poison to be a powerful muscle poison, as

active as veratria, and, unlike veratria, not prolonging the relaxation of a muscle after its contraction. It is a feeble poison to motor nerves, and has no effect on afferent nerves. It is as powerful a cardiac poison as digitalin, and more so than veratria. It anests the ventricle in systole, and does not prolong the systole of the heart nearly so much as veratria. It has but little action when administered by the mouth; 5 minims of a 5 per cent. solution hypodermically given will kill a cat in from 15 to 20 minutes, whilst 45 minims given by the stomach caused only nausea and vomiting, with a little weakness.

The antidote to this poison is made in Africa from five roots, which are said to be baked and afterwards ground and mixed with honey; unless given within 5 minutes of the time when the wound is received, the antidote does no good. In the hands of Dr. Ringer it proved to be worthless, whether given internally or applied topically.—*Ibid*., April 9, pp. 833-835.

Preparation of Cocaina.—V. Trupheme exhausts coca leaves by ether in Payen's percolator, arranged for continuous distillation, when a blackish-green liquid is obtained, which is evaporated to dryness. The residue is agitated with boiling water, which dissolves the alkaloid, leaving the impure wax behind. The solution is mixed with magnesia, evaporated to dryness, and the residue treated with amylic alcohol, from which slightly yellowish crystals are deposited, and these are obtained colorless by one recrystallization.—*Jour. de Phar. et de Chim*., April, 1881, p. 329.

Glucoside from Ivy Leaves.—The leaves of *Hedera helix* contain, according to Vendamme and Chevalier (1842), an alkaloid, *hederina*, and, according to Posselt (1849), a peculiar acid, *hederic acid*, and a tannin, *hederotannic acid*. F. A. Hardten (1875) obtained results indicating the probable presence of a glucoside. According to L. Vernet, the glucoside may be isolated by exhausting the bruised leaves (collected in December) with hot water, and subsequently preparing an alcoholic extract, which is powdered, washed with cold benzol, and afterwards treated with boiling acetone, from which the glucoside crystallized on cooling, requiring washing with cold acetone and crystallization from alcohol to obtain it pure. It crystallizes in nodules of colorless, silky needles, neutral to test paper, melts at 233°C., and burns without leaving any residue. It is insoluble in water, chloroform and petroleum, dissolves very slightly in the cold, but readily by the aid of

heat, in acetone, benzol and ether; its best solvent is hot 90 per cent. alcohol; hot alkalies dissolve it readily. Its alcoholic solution is levogyre —47.5°. Its composition is $C_{32}H_{54}O_{11}$. When heated with dilute sulphuric acid it yields a very sweet right rotating sugar, which reduces Fehling's solution, but does not ferment with yeast; and fine, inodorous and tasteless needles, $C_{26}H_{44}O_{11}$, which melt near 280°C., are less soluble in alcohol than the original compound, insoluble in alkalies and have a right rotation to polarized light.— *Rép. de Phar.*, March, 1881, p. 106, 107.

Cork Tar.—According to L. Bor.det, the liquid products of the dry distillation of cork separate into two layers, the lighter aqueous one containing acetic acid and methylic alcohol, together with ammonia, hydrocyanic acid, the higher homologues of acetic; acid, including propionic acid and small quantities of methylamina. The heavier tar is dark brown, rather thin and of a mor.e aromatic odor than coal tar. By distillation it yielded 27 per cent. of light oils, 27 per cent. of heavy brown oils, 11 per cent. of green fluorescing oils and 35 per cent. of hard pitch. The less volatile portions of the light oils yield much naphthalin. The tar contains at least 4 per cent. of benzol and 3 per cent. of toluol, but a much smaller quantity of phenols than coal tar. The green fluorescing oil contains considerable anthracene.—*Chem. Ztg.*, 1881, No. 16, p. 269 ; *Compt. Rend.*, 92, p. 728.

Senega Root.—H. W. Langbeck noticed the odor of gaultheria in a senega root which was at least three years old. Its aqueous distillate acquired with ferric chloride the well-known violet color, and by comparing the intensity of this reaction with that produced by an aqueous solution of oil of gaultheria, the presence of 0.225 per cent. of this oil in the senega root was estimated.—*Phar. Ztg.*, No. 35, p. 260.

Bulgarian Opium.—In the district of Lowtscha, Bulgaria, opium of a strong odor and bitter taste is produced, which, according to A. Theegarten, yields 11.2 per cent. of impure or 3 per cent. of pure morphia. Nearly 70 per cent. of this opium is soluble in water.— *Ibid.*; *Ph. Zeitschr. f. Russl.*

Adulterated catechu, has been observed by A. Jossart. It was of a rather pale brown color, and when finely powdered and completely exhausted with alcohol, 10 grams left a residue weighing 6.5 grams, which, with the exception of small fragments of wood and bark,

dissolved in hydrochloric acid, with abundant disengagement of carbonic acid gas; this solution contained mainly iron. From 60 to 65 per cent. of this catechu consisted of ferrous carbonate.—*Jour. Pharm. d'Anvers*, February, p. 41.

Testing of Bees' Wax for Adulterations.—F. Jean recommends testing for *water* by kneading the wax with well-dried copper sulphate or cobalt nitrate, when with the former salt a blue, and with the latter a rose color will be produced. The quantity of water is determined by heating 10 grams of the wax in a tared porcelain capsule to 100°C. until vapors cease to be given off. Mineral and starchy admixtures remain behind on dissolving the wax in rectified oil of turpentine; starch is detected in the residue by iodine; and on incinerating the insoluble portion, the loss of weight indicates the organic adulterations. The presence of sulphur is indicated by igniting the wax, when sulphurous acid will be generated. Resin imparts to wax a terebinthinate odor, and on mastication causes the adulterated wax to adhere firmly to the teeth. On adding to such wax, while fused, a few drops of sulphuric acid, the resin causes a dark red, or if present to the extent of only 1 per cent., a greenish color. On treatment with ether and evaporation of tlie solvent, the resin is left as a brittle mass, when cold.

If adulterated with paraffin, wax is brittle, kneaded with difficulty and has a lower congealing point. By heating with strong sulphuric acid the wax is carbonized and paraffin separated; soft paraffins, however, are not detected in this manner. If wax floats on alcohol of 15°B., — .961 sp. gr., adulteration with paraffin may be surmised. Vegetable wax is detected by boiling 10 grams of the wax with 120 grams of water and 1 gram of soda; a slowly separating soap will be formed, while the wax floats in the liquid. The presence of *lard* is indicated by the odor, the fatty touch and the acrolein odor on heating to charring. 10 grams of the wax are saponified by potash lye, the soap is decomposed by sulphuric acid, the clear supernatant layer is washed with hot water, treated with litharge and afterwards digested with ether. On treating the clear ethereal nitrate with sulphuretted hydrogen a black precipitate will be produced, and after complete decomposition and evaporation the residue will make a greasy stain on paper. For the detection of *stearin* one part of tlie wax is fused with 2 parts of a fixed oil, this mixed with an equal weight of water, and a few drops of lead acetate added, when white, very consistent flocks of lead stearate are separated.—*Chem. Ztg.*, 1881, p. 303, 304.

Factitious saffron, which has been sold to the confectioners and restaurants of Gand, is stated by Crispo to consist of

Water,	16.70
Extractive matter, containing glucose and coloring matter of saffron,	21.02
Vegetable filaments of unknown origin,	12.98
Mineral substances (barytine),	49.30

A little tincture of saffron is mixed with barytine, and the mixture attached, by means of a saccharine material, to the fibres, which are from 3 to 4 centimeters long.—*Jour. Phar. d'Anvers,* Feb., p. 68.

C. Kanoldt has examined a factitious saffron which was of a fine red-brown color and strong odor, and thrown into water colored it milky-yellow. It was found to consist of colorless threads, somewhat divided at the ends, which proved to be an alga, probably fucus amylaceus, which had been incorporated with a colored mixture of chalk and honey.—*Phar. Ztg.*, No. 34, p. 253.

PRACTICAL NOTES.

BY ROBERT F. FAIRTHORNE, PH.G.

Hydro-alcoholic Tinctures.—Practically, I have found that many of these can be prepared so as to make very satisfactory preparations, by macerating the medicinal ingredients for 24 hours in the alcohol alone, then filtering off and mixing with the required or an equal quantity of water and displacing with this mixture. My reason for preferring this method is that the alcohol more thoroughly exhausts the active or flavoring ingredient when alone than it would if mixed with water. Some may say that the result is the same, but I think if any one will try it they will find an advantage in separate treatment of the drug, especially in such as the compound tincture of cardamom, tincture of serpentaria and tincture of cubebs, the active ingredients of which are more soluble in alcohol than in water. In preparing such tinctures, after the alcoholic solution is filtered off, after maceration during 24 hours, and mixed with water, precipitation occurs. I contend, however, that

when this takes place more of the aromatic or active principle is retained in the mixture than would be the case if the same ingredients are treated with the dilute alcohol in the ordinary way. This is on account of the freer solubility of these substances in strong alcohol in the first place, and on account of the extremely fine division of the essential oils, or active ingredients, when precipitated by the addition of water, favoring greater solubility, on the same principle that the extremely fine division of camphor or other essential oils by means of magnesium carbonate renders them more soluble in water. The last-named fact appears to be generally accepted, and I think, upon reflection, the former will be also.

It leaves, moreover, the article thus treated in a condition better suited for the extraction of any substance soluble in water or in the mixture of the water and alcohol, and I think a trial of this method will convince any one making it of the advantages to be derived from it.

Mending Broken Glassware.—When glass funnels are cracked or broken, an easy and expeditious way to mend them will be be found by first warming the article broken over a stove, and applying strips of sheet gutta percha (about an inch wide) over the crack, and of such a length that they will cover the entire length of the split. After one piece is attached to the glass another is placed on this, and even a third or fourth layer is so disposed, in order to form a firm support to the broken pieces of glass, so as to present a proper continuity of surface, thereby restoring it to its original form. The glass should not be heated too much, but only to a degree sufficient to render the gutta percha applied to it adhesive. This sticks very tenaciously to the glass. I have mended funnels by this plan that have been broken in "four or five pieces, and have found them quite as useful as the unbroken ones.

The ease with which articles can be thus mended, and the strength given them by being .thus supported by so strong a substance, will doubtless commend its use to many who, like myself, make much use of glassware.