AMERICAN JOURNAL OF PHARMACY
Volume 53, #2, February, 1881

Botanical Medicine Monographs and Sundry

OLEUM BETULÆ EMPYREUMATICUM AND TINCTURA RUSCI.

BY THE EDITOR.

Three correspondents in New York have favored us with the information that *Tinctura rusci* is not a tincture of the obsolete butchers broom, as we suggested on page 33 of the January number, but that it is an alcoholic solution of birch oil, or rather birch tar, which is largely manufactured in Russia and Poland, from birch bark, by a process of descending distillation similar to that employed in the preparation of ordinary tar. This birch tar resembles wood tar in appearance, but has a peculiar penetrating odor, and is used in the manufacture of Russia leather, which owes to it its peculiar odor. Its common name is *degutt* or *dagget*, and it was formerly employed in medicine and in veterinary practice under the following names and synonyms: *Oleum betulinum, s. rusci, s. russicum, s. moscoviticum, s. lithauinicum*.

Birch tar contains, probably, the principal constituents of common wood tar. By distillation, A. Sobrero, in 1842, obtained a brown oily liquid, of a strong odor, lighter than water, and of an acid reaction. On fractionating this product near 100°C. a pale yellow oil was obtained having an agreeable odor, resembling that of turpentine and birch bark, and an acid reaction. After treatment with potassa and lime water it was again rectified, and had then a more agreeable smell, like birch bark. Its composition was found to be $C_{10}H_{16}$. It dissolves in alcohol and ether, and is a solvent for resins. Between —16° and —17°C. (about 2°F.) it congeals partly; its boiling point is 156°C. This is the only analysis of birch tar with which we are acquainted; the principle to which the strong odor of birch tar is due does not appear to have been chemically examined.

Recently, birch tar has been to some extent prescribed in New York in the form of *tinctura rusci* and *pomatum rusci*, occasionally simply as *rusci*. There does not appear to be any authoritative formula for either preparation; for, while one correspondent informs us that they are usually made by mixing one part of birch tar with three or four parts of alcohol, or the pomade with three or four parts of soft paraffin, another correspondent send us the following formula for tlie tincture:

Olei rusci,	10.0
Alcoholis and	
Ætheris,	15.0
Olei lavandulae,	
" rosmarini,	
" rutae,	0.4 each

Mix and filter.

This is Hager's formula for the external use of birch tar in rheumatism and gout, except that Hager orders 0.5 gram of each of the volatile oils.

Hager, in "Pharm. Praxis," gives, also, the following for *Essentia Rusci*:

Olei rusci,	10.0
Alcoholis,	100.0

Mix, and, after decantation, filter.

Birch tar has also been used in menorrhoea, piles, cancer, venereal ulcers, as an anthelmintic, and in intermittent fever, in doses of from 6 to 10 grains three times daily, usually in the form of pills. At present it seems to be mainly employed in skin diseases, and the pomade referred to above is often sold in New York as Hebrews tar pomade.

* * * * *

Taxus baccata.—D. Amato and A. Capparelli have isolated from the green needle-shaped leaves of the yew an alkaloid, which is colorless, crystalline, of a musty odor and produces dense white fumes with the vapors of hydrochloric acid. It is sparingly soluble in water, freely soluble in alcohol and ether, and yields precipitates with several reagents for alkaloids, those with solution of iodine in potassium iodide and with tannin becoming crystalline ("Gaz. Ital.," x, p. 349). Similar results were obtained by Marme, see "Amer. Jour. Pharm.," 1876, p. 353.

Amato and Capparelli obtained also a volatile oil resembling that of wild fennel in odor, and a colorless non-nitrogenous principle, crystallizing in stellate needles, which are sparingly soluble in cold, but freely so in hot alcohol.

RESEARCHES ON THE ALKALOIDS OF JABORANDI LEAVES.

BY E. HAMACK AND H MEYEIt,

In addition to pilocarpin, the authors have obtained a second alkoloid from the leaves of jaborandi (*Pilocarpus pennatifolius*), for which they propose the name of “jaborin.” The separation of the two alkaloids depends on the facts that free jaborin is more easily soluble in ether and more sparingly soluble in water than pilocarpin, and its platinochloride more soluble in alcohol than that of the latter-alkaloid; also that the compounds of jaborin do not crystallize.

The presence of minute quantities of jaborin in pilocarpin is most easily detected by its action on a frog's heart, since jaborin exactly resembles atropin in this respect.

From analyses of pilocarpin aurochloride and platinocliloride the authors assign to the free base the composition indicated by the formula $C_{11}H_{16}N_2O_2$.

A curious fact was observed with regard to its aurochloride. When pilocarpin chloride is mixed with gold chloride, a crystalline precipitate is obtained consisting of $C_{11}H_{16}N_2O_2HCl + AuCl_3$. If this is dissolved in alcohol and boiled for a time, a crystalline salt having the composition $C_{11}H_{16}N_2O_2+AuCl_3$, separates on cooling.

The authors are inclined to class pilocarpin among tertiary diamines. Since the physiological action of pilocarpin is analogous to that of nicotin, experiments (which proved unsuccessful) were made to ascertain if there were any relation between its composition and that of nicotin, $C_{10}H_{14}N_2$. Pilocarpin might, for example, be regarded as a methyl substitution-product of nicotin, thus :

$$C_{10}H_{11}(CH_3)(HO)_2N_2=C_{11}H_{16}N_2O_2.$$

This view is supported by the fact that jaborandi leaves yield pyridin bases among other products of their decomposition, and nicotin does the same.

Trimethylamin is formed during the dry distillation of pure pilocarpin with excess of alkali, but no coniin. Also when crude pilocarpin was distilled alone no coniin could be detected, but when distilled at 160° with excess of alkali small quantities of a body identical with coniin are formed, as stated by Poehl ("Ber.," xii, 2185), due probably to some products of decomposition, possibly of jaborin.

Preparation of Jaborin.—The crude product (commercial preparation of pilocarpin, etc.) dissolved in alcohol is submitted to fractional precipitation with an alcoholic solution of platinum chloride. The first part of the precipitate which forms a hard mass, insoluble in water, is removed; the decanted liquid is again precipitated and filtered, and the solution then fully precipitated. After filtration from the precipitate, the jaborin platinochloride separates from the alcoholic solution. The salt, together with the third precipitate, is extracted with hot water and the filtrate concentrated by evaporation over sulphuric acid in a vacuum. Jaborin platinochloride is a bright yellow powder or a dark-red amorphous crumbling mass. The deeper color is due to impurities, which can be partly removed by washing with alcohol. Another method of obtaining tolerably pure jaborin is to mix the aqueous solution of the crude substance with hydrochloric acid, filter, and add mercuric chloride until a precipitate forms. On shaking and filtering, a bright yellow liquid is obtained: sulphuretted hydrogen is added to remove the mercury, and the concentrated liquid is mixed with soda solution and shaken up with ether. On evaporation, jaborin is left as a clear colorless amorphous body. Jaborin is a very strong base, which diners from pilocarpin, especially in its sparing solubility in water and more ready solubility in ether. Its salts are soluble in water and alcohol, and do not crystallize. Free jaborin volatilizes with difficulty at high temperatures. It probably belongs to the tertiary amines. The composition of jaborin is eitlier identical with that of pilocarpin, or their empirical formulae are closely related. It is probably contained in small quantities, together with pilocarpin, in the leaves of the plant.—*Jour. Chem. Soc.*, Dec., 1880, from *Annalen*.

ON WALDIVIN AND CEDRIN.

BY CH. TANRET.

Translated from "Bull. general de Thérapeutique" (Tome xcix, 1880, pp. 504 to 506), by FRED. B. POWER.

The *Simaba waldivia* (Simarubaceae) grows in Columbia, where it is sometimes, but wrongly, confounded with a tree of the same family, the Simaba cedron. Its fruit, which possesses an extreme bitterness, shares with that of the latter the reputation of the remarkable properties which have been attributed to the cedron in the republics of the equator, and of which several travelers have already spoken to the academy. At the request of Mr. Dujardin-Beaumetz, who was desirous of studying the physiological and therapeutical action of it, the author has isolated the two active principles of the two fruits, which were obligingly furnished him by Mr. Bestrepo. Only that of the waldivia was obtained crystalline, and this is now called *waldivin*.

Preparation.—The finely-powdered waldivia is extracted with alcohol of 70 per cent., and then distilled. The residue while still warm is agitated with a large quantity of chloroform, which takes up the waldivin, and the carefully separated chloroformic liquid is then distilled to dryness, the latter residue, wlien taken up again with boiling water, separates, on cooling, the waldivin in crystals. The yield is very variable, according to the fruits; thus from 1 part to 1000, of badly preserved fruits, it may amount to as much as 8 from recent and dry waldivias.

Composition.—The crystals of waldivin contain water of crystallization, and their composition may be represented by the formula $C_{36}H_{24}O_{2}0.5H_{2}O$. When heated to 110°C. they lose 10 per cent., and the formula requires 9.8 per cent.; on the other hand, the analysis of the anhydrous body has given the following results:

	Found. I.	Found. II	Calculated for $C_{36}H_{24}O_{20}$
C	54.40	54.2	54.
H	6.22	6.3	6.
O	39.38	39.5	40.
	100.00	100.0	100.

Physical Properties.—The waldivin crystallizes in hexagonal prisms, terminated by a double hexagonal pyramid; it has the specific gravity 1.46, and when heated loses its water of crystallization, then melted at about 230 °C. it becomes colored, but is not volatile, and possesses no rotatory power. It is very sparingly soluble in cold water (600 parts at 15°C.), but dissolves in 30 parts of boiling water, acids and salts increasing its solubility considerably, and its aqueous solutions froth strongly upon agitation; it dissolves in 60 parts of 70 per cent. alcohol at 15°C., but requires 190 parts of absolute alcohol. Chloroform dissolves it abundantly, but it is insoluble in ether. It possesses an extreme bitterness.

Chemical Properties.—The waldivin is neutral, its aqueous solutions are precipitated by tannin, and by ammoniacal acetate of lead; the neutral and basic acetates of lead do not precipitate it. In the cold, sulphuric and nitric acids dissolve it without appearing to produce any sensible alteration, the solutions not being precipitated on the addition of water; but if the solutions be neutralized by means of an alkaline bicarbonate, and if the salt formed is not in sufficiently large quantity to hold it in solution, the waldivin is partially deposited.

The most remarkable property of the waldivin is the facility with which it is decomposed by alkalies; with caustic alkalies the loss of its bitterness is almost instantaneous; with ammonia and the alkaline carbonates the decomposition is less rapid, particularly in the cold, and still less rapid with the bicarbonates.

At the same time that the bitterness of the waldivim disappears the liquid becomes colored deeply yellow, and is again decolorized when acidified. The solution, which contains the products of the decomposition of the waldivin reduces Fehling's solution, and deviates the plane of polarization to the right, but, not being able to produce fermentation, the formation of glucose cannot be affirmed.

In 1851, Lewy extracted from cedron a bitter crystallizable principle, which he called cedrin, and of which he described very summarily the preparation, and indicated some of its properties. Since that time, Cloez has taken up the study ("Ann. des Sciences Naturelles"), but could not obtain the cedrin, the author also having not been able to obtain the bitter principle in a crystallized state, which he has extracted from the fruits of *Simaba cedron*. As there can be no doubt that Lewy was in possession of the true cedron, the author admits, in explanation of these contradictory results, that the fruits that the former had treated could have been mixed with those of the waldivia, and that it was thus the latter which had furnished the crystals which he had obtained.[1]

Cedrin.—The cedron contains more than one-tenth of its weight of fatty matter, which is quite soluble in alcohol, and from which it follows that the process given for the extraction of waldivin must be slightly modified. The powdered cedron is treated with water at 50°C., then heated to boiling to coagulate the albumin, filtered and agitated with chloroform. The latter is distilled to dryness, and the residue again taken up with water, when, on evaporation of the aqueous solution, the cedrin is obtained in the form of a yellow varnish, without the least trace of crystallization.

The cedrin is very soluble in water, in which it softens before dissolving; its distinctive character is its superb greenish-yellow fluorescence, which is shown even in very dilute solutions. Like the waldivin it is exceedingly bitter; but this is not completely destroyed by alkalies; it is neutral to litmus, but tannin and the reagents for alkaloids form precipitates in its aqueous solution.

In concluding, the author expresses the opinion that this cedrin does not appear to be a body of which the purity may be guaranteed, and that new researches are necessary on the subject.

* * * * *

Georgia Bark.—In an article of the New York Times referred to elsewhere (see above) the importance of making systematic experiments for cultivating different species of cinchona in the United States is discussed, and it is stated that there exists a "pseudo-cinchona" tree in Georgia. The tree alluded to is undoubtedly the one called "Georgia bark" in Porcher's Resources of the Southern Fields and Forests. This is the *Pinckneya pubens* of Michaux, ord. Rubiacese, subord. Cinchonæ which is found on riverbanks and in swampy locations from South

1 Lewy cites indeed in the text the *Simaba cedron*. At the end of his note, Dumas has added that a traveler, Saillard of Besancon, had just brought a certain quantity of cedrons, which could serve for chemical and therapeutical experiments. Now, the last cotyledon of the fruits which remained from those brought from America by his father has been confided to him by Dr. Saillard, and this is a true cedron, not a waldivia.—*Comptes Rendus*, 1851.

Carolina southward to Florida. Under cultivation it usually branches from the base, but in its native localities it is a beautiful tree 20 feet or more in height, with large opposite ovate and acute leaves and with downy cymes of purple-colored flowers, which are radiant by the expansion of a calyx segment of the marginal flowers.

Michaux reported the bark to be useful in intermittent fever, and more recently, Dr. Law, of Georgia, and Dr. Fauntleroi, of Virginia, corroborated this statement. The latter considers it too slow in its action to be used as a substitute for quinia, but as deserving a position in the front ranks of vegetable tonics; it usually produces diaphoresis. The bark is given in the form of powder or of decoction in the dose of about one drachm. Dr. Farr is said to have detected a considerable amount of cinchonia in it, which statement is, probably, not correct, though the substance obtained may have been an alkaloid. It will be remembered that many plants of this order owe their properties chiefly to alkaloids. J. M. M.

VARIETIES.

OIL OF WINTERGREEN IN PURULENT CYSTITIS.—Dr. Perier, of the St. Antoine Hospital, Paris, regards this oil as a powerful antiseptic irritant, and employs the following combination:

Oil of wintergreen, six grams;
tinct. of guillaya saponaria, thirty grams;
water, one liter.

This forms an excellent fluid for injecting into the bladder, for washing wounds and for some simple dressings.—*Amer. Practitioner,* January.

HOT WATER FOR SWEATY FEET.—In an article in the Ohio "Medical Recorder," Dec., 1880, Dr. Pooley says:

Dr. Gay, of Columbus, informs me that when he was at the Hot Springs,. in Arkansas, he saw there what was called the "corn hole," being one of the hot wells for which the region is celebrated, in which numerous persons were in the habit of soaking their feet for many hours every day, until their corns were thoroughly macerated, and could easily be pulled out by the roots. He was told that it also cured sweaty feet, which he found, on inquiry, to be the fact, and since his return home he has cured this affection in many instances, by simply directing the feet to be soaked, for hours every day, in water as hot as can be borne.—*Med. and Surg. Rep.*, Jan. 8,

FETID SWEATING OF THE FEET.—A correspondent of the "British Medical Journal" recommends, in this annoying condition, that the affected portions of the sole of the foot be covered with ordinary adhesive plaster. This should be renewed in three or four days, and again after a week. The fetor ceases from the first application.—*Chicago Med. Review*,. January 5.

THE MOVEMENTS OF PLANTS.—Since the time of Linnaeus, men have wondered and speculated about what are known as the spontaneous movements of plants, and in recent years the causes of these movements have been carefully investigated by botanists. The subject in its various bearings now forms a, large part of the science of vegetable physiology. The periodical and irritable motions of plants, and those due to light and gravity, have been closely studied in connection with the mechanical laws of growth, and many of these phenomena have been more or less satisfactorily explained.

But it has been reserved for Mr. Charles Darwin to go deeper into the facts and philosophy of tlie subject than any of his contemporaries. In 1875 he published a book upon "The Movements and Habits of Climbing Plants;" and he has since extended his inquiries so as to include the movements manifested by the entire vegetable series, except the lowest flowerless plants, and upon these he is now engaged. He has just published an account of these researches in a volume of six hundred pages, uniform with his other works.—Eliza A. Yozimans, in *Popular Science Monthly* for February.

CLOVER TEA FOR CANCER.—A writer in the "Medical News" says: The clover tea has done wonders for me. My appetite is now good, my general health greatly improved, and the wound is healing. For seven months I have had to take morphia, and its unpleasant effects had become great. My pain having so much diminished under the use of the clover tea, and my general health having gotten so much better, I determined to give up the morphia, and have gotten on comfortably without it. If my experience will save one poor suffering fellow creature a single pang such as I have suffered, I will thankfully bear my cross, and rejoice that through me a remedy has been found which will give relief, if not cure, for cancer. The tea should be made as tea is made for table use, strained, and taken before meals and at bedtime, about a quart daily. The blossoms of red clover should be used.

A fluid extract has been made, of which the dose is a tablespoonful thrice daily.— *Va. Medical Monthly*.

ACTINOMERIS [Verbesina] HELIANTHOIDES.—The root of actinomeris helianthoides is from the size of a quill to that of a knitting needle, and has an oil and perhaps a resin in it, giving it the taste and somewhat the smell of turpentine. It has long been used by the people of Upper Georgia in dropsy, under the name of diabetes weed. Dr. I. G. M. Goss says that he has used it in several obstinate cases of dropsy and in several cases of chronic cystitis with fine effect; also in calculous affections and in chronic inflammation of the entire urinary tract. He gives it in the form of a tincture, one or two drachms to a dose, as a diuretic, or as an infusion, in doses of one-half to one ounce, repeated every hour or two. It may be tinctured in sweet spirit of nitre, eight to sixteen ounces of nitre.—New York Med. Jour., from Med. Times, Nov. 20th.

BELLADONNA JUJUBES.—The influence of belladonna upon the mucous membranes is well known, and hence its value in some forms of irritable bladder and especially in the "nocturnal incontinence" of children, has long been fully recognized ("British Med. Jour."). Now, children do not like medicine, but they do like sweetmeats. Dr. J. Hickinbotham, physician to the Birmingham and Midland Hospital for Women, has, therefore, had made some jujubes of most agreeable flavor, each containing two minims of the pharmacopoeial tincture of belladonna. The use of the jujubes will of course not be limited to the cases above described. Dr. Hickinbotham has found them useful in an obstinate "tickling" cough.—*Louisv. Med. News*, December 25th.

MOUNTAIN FEVER, Dr. Alfred Wise, visiting physician to the Infirmary for Consumption, writes, in the "British Med. Jour.," is one of the dangers in the "high-altitude treatment" of phthisis now so fashionable.

PEPTIZED MILK AS FOOD FOR INFANTS AND INVALIDS.—Nunn recommends the following modes of preparing this valuable food:

Take one pint of milk at 80°F., add a teaspoonful of rennet solution or 10 grains of pepsin, and keep the mixture at 80°F. When coagulation is complete, but before the whey has begun to separate, beat the whole up smooth with a whisk or beater, and pass through a fine milk-strainer to insure the minute division of the curd. This preparation appears to keep equally as well, or better, than raw milk, remaining apparently unchanged for twenty-four hours if kept cool. Dilute and sweeten for feeding as usual.

By this method coagulation is complete, and no further change of that nature is requisite, the weakened stomach of the invalid receives the necessary nutriment, carrying with it its own digestive principle.—*Buffalo Med. and Surg. Jour*., Dec., 1880.

WHY WE EAT OYSTERS RAW.—Dr. William Roberts, in his interesting lectures on the digestive ferments, says: "The oyster is almost the only animal substance which we eat habitually, and, by preference, in the raw or uncooked state, and it is interesting to know that there is a sound physiological reason at the bottom of this preference. The fawn-colored mass which constitutes the dainty of the oyster is its liver, and this is little less than a heap of glycogen. Associated with the glycogen, but withheld from actual contact with it during life, is its appropriate digestive ferment—the hepatic diastase. The mere crushing of the dainty between the teeth brings these two bodies together, and the glycogen is at once digested without other help by its own diastase. The oyster in the uncooked state, or merely warmed, is, in fact, self-digestive. But the advantage of this provision is wholly lost by cooking, for the heat employed immediately destroys the associated ferment, and a cooked oyster has to be digested, like any other food, by the eater's own digestive powers."—*Amer. Med. Monthly*, Nov., 1880.

WHAT IS THE NATURAL FOOD OF MAN?—As an abstract truth, the maxim of the physiologist Haller is absolutely unimpeachable: "Our proper nutriment should consist of vegetable and semi-animal substances which can be eaten witli relish before their natural taste has been disguised by artificial preparation." For even tlie most approved modes of grinding, bolting, leavening, cooking, spicing, heating and freezing our food are, strictly speaking, abuses of our digestive organs. It is a fallacy to suppose that hot spices aid the process of digestion:. they irritate the stomach and cause it to discharge the ingesta as rapidly as possible, as it would hasten to rid itself of tartarized antimony or any other poison; but this very precipitation of the gastric functions prevents the formation of healthy chyle. There is an important difference between rapid and thorough digestion. In a similar way, a high temperature of our food facilitates deglutition, but, by dispensing with insalivation and the proper use of our teeth, we make the stomach perform the work of our jaws and salivary glands; in other words, we make our food less digestible. By bolting our flour and extracting the nutritive principle of various liquids, we fall into the opposite error: we try to assist our digestive organs by performing mechanically a part of their proper and legitimate functions. The health of the human system cannot be maintained on concentrated nutriment; even the air we inhale contains azotic gases which must be separated from the life-sustaining principle by the action of our respiratory organs—not by an inorganic process. We cannot breathe pure oxygen. For analogous reasons bran-flour makes better bread than bolted flour; meat and saccharine fruits are healthier than meat-extracts and pure glucose. In short, artificial extracts and compounds are, on the whole, less wholesome than the palatable products of Nature. In the case of bran-flour and certain fruits with a large percentage of wholly innutritious matter, chemistry fails to account for this fact, but biology suggests the mediate cause: the normal type of our physical constitution dates from a period when the digestive organs of our (frugivorous) ancestors adapted themselves to such food—a period compared with whose duration the age of gristmills and made dishes is but of yesterday.— *From Physical Education, by Dr. Felix L. Oswald, in Popular Science Monthly for January.*