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## Botanical Medicine Monographs and Sundry

### **COLLINSONIA CANADENSIS, LINNÉ.**

*Natural order, Labiatae.*

By CHARLES NAPIER LOCHMAN, PH.G.

*From an Inaugural Essay.*

The thick, hard, knotty rhizome, from which the plant undoubtedly received the names stone-root and knot-root, grows horizontally but a few inches beneath the surface of the soil and attains a length of about six or eight inches. The plant seems to delight in stony soil, as it is always found in mountainous or very rocky and shady situations. At, and after the time, of flowering, the leaves have an agreeable lemon-like odor, due to volatile oil contained in glands on the under-surface. About the time that the fruit is mature, especially if the plant is so situated as to be in the direct sunlight for part of the day, the calices have an odor similar to that of caraway; whether this is due to a volatile oil or a resin I have not been able to ascertain.

*Description.*—Flowers in racemes, arranged in a terminal panicle. The calices and pedicels covered with stalked glands. Calyx somewhat bilabiate, becoming four-sided and much enlarged in fruit; upper lip with three sharp-pointed teeth, lower with two lanceolate lobes; hairy in the throat. Corolla light yellow, generally purple-veined and hairy on the inside, elongated, widening from the throat outwards; four upper lobes small and obtuse; lower lobe much larger, ligulate and beautifully lacinate fringed. Fertile stamens two (with rudiments of a second pair), exerted, much exceeding the corolla. Style, purple, two cleft at the apex, about the length of the fertile stamens. Ovary deeply four parted, usually ripening only two of the four nutlets. Stem simple, erect, smooth, glaucous, obtusely four angled; from two to five feet high. Leaves thin, smooth, light green above (somewhat darker in the dried state), whitish underneath, ovate, coarsely serrate, abrupt, or somewhat heart-shaped at the base, taper-pointed the under surface dotted with small, depressed glands, containing volatile oil.

The rhizome is from one to one and a half inches in thickness, four to eight inches long, irregularly branched, the upper surface marked with cup-shaped scars left by the stems of former years; on the lower surface it is covered with long, thin, brown rootlets; it has a thin, brown bark, and a very hard white wood more or less mottled with brown.

*Analysis.*—The drug was treated with menstrua in the order given in *Dragendorff's Plant Analysis*. One gram of the powdered rhizome and rootlets yielded .029 gram of ash, after being thoroughly ignited in a porcelain crucible. Fifty grams of the powdered rhizome and rootlets were macerated with 250 cc. of petroleum spirit for one week and the filtered liquid was allowed to evaporate spontaneously, when there was

remaining 1.2 gram, or 2.4 per cent. of the weight of the drug employed. On heating this to 110°C. for some time, there was no loss in weight, showing the absence of an appreciable quantity of volatile oil. The residue was of a semisolid waxy consistence, melting at 40°C., soluble in boiling alcohol, from, which it was partly precipitated on cooling, and wholly on the addition of water. This appears, to be vegetable wax.

After allowing the petroleum spirit to evaporate from the powder, it was treated with 250 cc. of stronger ether and this liquid allowed to evaporate at the ordinary temperature, when .3 gram of a somewhat bitter, yellowish, resinous substance was left. On treating this with slightly acidulated water a light yellow liquid was obtained, showing negative results with potassio-mercuric iodide and other tests for alkaloids. Ferric chloride produced a greenish black precipitate which afterwards became inky. A precipitate was also formed on the addition of gelatin. The part remaining after treatment with acidulated water had all the characters of a resin and was almost completely soluble in 95 per cent. alcohol, partly soluble in a solution of potassa, and of a slight bitter taste.

After the ether had evaporated from the powder, it was macerated for eight days with alcohol, and the filtrate made up to 250 cc. Fifty cubic centimeters of this filtrate evaporated left .59 gram of extract, equal to 5.9 per cent. vegetable matter, neither soluble in petroleum spirit nor ether, but soluble in alcohol. On incinerating this extract an almost unweighable ash remained, which proved to be principally carbonate of potassium. From the remaining filtrate the alcohol was distilled off and the residue carefully dried over sulphuric acid. The yield was a slightly bitter extract, in which tannin, which turned ferric salts greenish black and precipitated gelatin, was present, but no alkaloid could be found.

The powder remaining from the last operation was then macerated for twenty-four hours with 500 cc. of water, the infusion filtered off, and the dregs washed with sufficient water to bring it up to 500 cc. On evaporating a portion of this liquid it yielded an extract equal in weight to 10 per cent. of the original quantity of the drug employed; 20 cc. of this infusion was mixed with twice its volume of alcohol, when a precipitate was formed weighing .02 gram. This precipitate dissolved in water did not reduce Fehling's solution until it had been boiled with dilute hydrochloric acid. Its concentrated solution precipitated basic acetate of lead (vegetable mucilage).

A portion of the root on being boiled with water gave, on the addition of a solution of iodine, an intensely blue color (starch).

*Leaves.*—Ten grams of the powdered leaves were treated in the same manner as the rhizome, excepting a larger proportion of menstruum was used in each case. The petroleum spirit yielded .3 grain, or 3 per cent. of extract consisting of waxy matter soluble in boiling alcohol, a caoutchouc-like substance soluble in ether, and a trace of volatile oil. The ethereal tincture yielded .44 gram, equal to 4.4 per cent. of extract, which had little taste and odor, and on being triturated with sand and cold water gave a slightly yellowish brown solution, colored greenish black on the addition of ferric chloride. A few drops of acetic acid were then added to the liquid, which, together with the resin, was triturated for a few minutes, allowed to stand for two hours, and filtered. This liquid did not show any indication of an alkaloid upon the application of

the various tests. The alcoholic tincture yielded .47 gram of a dark green extract containing tannin and chlorophyll, but no trace of an alkaloid.

About 16 lbs. of fresh leaves, collected when the plant was in full blossom, were distilled, yielding one drachm of a very light yellow volatile oil of a pleasant lemon-like odor.

From the foregoing meagre experiments the rhizome is shown to contain a resin soluble in ether and partly soluble in alcohol, vegetable wax, tannin, mucilage and starch; and the leaves resin, chlorophyll, tannin, wax and volatile oil. The volatile oil is nearly all dissipated on drying, at least after several months. It seems almost impossible that this nearly tasteless rhizome should have the wonderful properties ascribed to it by certain eclectic physicians. If any part of the plant is of any use medicinally, I would judge it to be the fresh leaves.

## MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPOEIA. PART 1

BY THE EDITOR.

The "Sociedad Farmaceutica de Mexico," published a national pharmacopoeia in 1874, and a second revised edition of this work appeared last year in the Spanish language under the title of "Nueva Farmacopea Mexicana de la Sociedad Farmaceutica de Mexico," the revision having been entrusted to a permanent commission consisting of Professors Alfonso Herrera, Francisco Gonzalez, Jose M. Laso de la Vega, Severiano Perez and Dr. Manuel S. Soriano.

It is a handsome octavo volume, the first 32 pages of which are occupied with a historical introduction and an explanation of the arrangement of the work. Then follow 16 pages of preliminary matter, containing various tables, the most important of which for our purpose are the tables of weights and measures. All pharmaceutical preparations being made by weight, a comparison of the medicinal weights will serve to show the great difference between the values attached to the same signs used in prescriptions in Mexico and in the United States.

Mexican weights.	United States weights.
℥ i = ℥ xvi = gr. 9216 = gm. 460.24	℥ i = ℥ xii = gr. 5760 = gm. 373.24
℥ i = ℥ viii = gr. 576 = gm. 28.76	℥ i = ℥ viii = gr. 480 = gm. 31.10
℥ i = ℥ iii = gr. 72 = gm. 3.60	℥ i = ℥ iii = gr. 60 = gm. 3.89
℥ i = gr. 24 = gm. 1.20	℥ i = gr. 20 = gm. 1.30
gr. i = gm. 0.05	gr. i = gm. 0.065

The Mexican measure of capacity, the *cuartillo*, is nearly 4 per cent. smaller than the American pint, the former being 456.00 cc., the latter 473.18 cc. The *cuartillo*, like the American pint, is subdivided into 16 fluidounces (onzas medidas), the American fluidounce (29.57 cc.) being about 1 cc. larger than the Mexican onza medida (28.50 cc.); the latter is further subdivided into 8 fluidrachms, and these into 3 fluid scruples.

The second part treats, upon 94 pages, upon the crude drugs derived from the vegetable, animal and mineral kingdoms; and this is followed by the pharmacopoeia proper (*Farmacopea propriamente dicha*), which is divided into two parts, the chemical products (112 pages) and the pharmaceutical preparations (96 pages), with 3 pages of supplement and appendix. The index alone covers 72 pages, and is divided into six separate parts, the Spanish, French, English, Mexican (and several other idioms) and Latin references, and an index of authors mentioned in the work. A lengthy list of typographical corrections, covering more than four pages, completes the book.

The text is printed in rather small but clear types, set closely, and is arranged in double columns in alphabetical order of the Spanish names of the subjects. The natural products (crude drugs) are treated of more or less extensively under the following sub-headings, following the names with the vernacular synonyms, botanical origin and natural order: habitat, part used or mode of preparation, physical characters, varieties, chemical composition, adulterations, common and special uses in medicine, therapeutics, the arts or for economic purposes, as well as incompatibles and antidotes. The chemical products and pharmaceutical preparations are treated of in a somewhat similar manner, the process of manufacture being given somewhat in detail.

It will be observed that the Mexican Pharmacopoeia partakes in reality more of the character of a dispensatory than of a medical and pharmaceutical law-book. This becomes also evident from the very large number of drugs admitted, some of which are stated to be little used, like brusco (*Ruscus aculeatus*), opopanax, and others which have become obsolete in most civilized countries. While obviously the materia medica list enumerates a large number of drugs, which are well known here and elsewhere, it is of particular interest for the large number of vegetable products of Mexican origin which have been admitted, and to these we propose to pay special attention in the following brief review.

**Abanico**, *Celosia cristata*, Lin., nat. ord. Amaranthaceae, the cockscomb cultivated in our gardens, grows in the Sierra de Huauchinango, and is popularly used in decoction of the leaves as as an antibleorrhagic.

**Abelmosco**, *Hibiscus Abelmoschus*, Lin., nat. ord. Malvaceae, furnishes the musk seeds of commerce, which are used as a perfume, and in the form of decoction as an emmenagogue and as an antidote to snake bites. The root is used medicinally as an emollient.

**Abrojo de tierra caliente**, *Tribulus terrestris*, Lin., nat. ord. Zygophyllaceae; indigenous to Yucatan. The root and seeds are commonly used for their tonic, stimulant and aperient properties, and a decoction of the leaves and stem, in the form of baths, against articular rheumatism. Taken internally the decoction of the leaves and root has a diuretic action.

**Acedera**, *Rumex Acetosa*, Lin., nat. ord. Polygonaceae, is somewhat employed as a diuretic.

**Aceite de Abeto** is the turpentine obtained from *Pinus religiosa*, Humb. et Bonpl, nat. ord. Pinaceae. The tree grows in the mountains surrounding the valley of Mexico and in other parts of the republic. The turpentine is viscous, nearly colorless, ultimately greenish yellow, has a lemon-like odor and a bitter, acrid and aromatic taste, dissolves incompletely in alcohol and mixed with one-tenth of calcined magnesia, acquires in about two days a pilular consistence. It contains volatile oil, extractive and resinoid matter, and abietic and succinic acids. It is procured by puncturing by means of a little tube the vesicles in which it is secreted in the bark. Ocote turpentine from *Pinus Teocote*, Schlechtendal, is frequently substituted for it, but differs materially in its physical properties.

**Acíbar**, *Aloe*. Socotrine, hepatic (also called opaque socotrine), Cape and Barbadoes or Jamaica aloes are recognized. Socotrine aloes is stated to be superior to the other varieties, but Cape aloes is mostly employed in Mexico. Several species of aloe growing in Mexico might probably be used for obtaining this drug.

**Acónito**, *Aconitum Napellus*, Lin., nat. ord. Ranunculaceae. According to Oliva this plant grows in the sierra between Mazatlan and Durango; the variety *delphinoides* has been described by De Candolle as being peculiar to Central America. The leaves are the only part employed in Mexico

**Axoyatic**, *Ipomoea muricata*, Kunth, nat. ord. Convolvulaceae, grows on the hills of Tacubaya and other places of the valley of Mexico. The root is rich in resin and is employed as a purgative.

**Achicoria dulce**, *Sonchus oleraceus* and *S. ciliatus*, Lin., nat. ord. Compositae; abundant near the City of Mexico. The root is commonly used as a tonic, and the leaves for their emollient and galactagogue properties.

**Achiotillo**, *Bixa Orellana*, Lin., nat, ord. Bixaceae, grows in hot localities. The leaves are popularly used as a purgative, and the seeds as an antidote to *Manihot aesculifolia*, Pohl. From the seeds the dye stuff annato, achiote, is prepared, which is regarded as an antidiysenteric. But the plant and its products are rarely used by physicians.

**Adormideras**, *Papaver somniferum*, Lin., nat. ord. Papaveraceae; the capsules are used.

**Agallas de Lavante**, nutgalls. Under the name of *borregos de encina* the lanuginous galls of the evergreen Mexican oaks are popularly used as hemostatics; they are produced by the sting of *Cynips Quercus baccarum*.

**Agarico blanco**, white agaric; used as a drastic and against profuse sweating of consumptives.

**Agarico yesca**, spunk; used surgically. *Boletus igniarius* is stated to be more commonly used in Mexico than *B. fomentarius*.

**Agrimonia Eupatoria**, Lin., nat. ord. Rosaceae; our agrimony, grows also in Mexico.

It is used as a mild astringent in the form of infusion or decoction in the proportion of 20:1000.

**Aguacate**, *Persea gratissima*, Gaertner, nat. ord. Lauraceae, grows in the temperate and warm regions of Mexico, producing the varieties *vulgaris*, *oblongo*, *microphylla* and *Schiedeana*. The pulp of the fruit was found by Betancourt to contain various fats, chlorophyll, malic and acetic acids, various salts, glucose, gum and starch. The seeds contain yellow volatile oil, mannit, green bitter resin, starch, little tannin, fat, gum, etc. Betancourt found also amygdalin and synaptase, yielding hydrocyanic acid, and in the epicarp soft acid resin, aromatic principle, tannin, etc. The leaves and fruit have the reputation of being emmenagogue, and according to Hernandez, are believed by the vulgar to increase the spermatic secretion and to be useful in suppuring wounds and sores. A decoction of the leaves like the powdered bark is employed as an antiperiodic. The pericarp enjoys considerable reputation as a vermifuge in the dose of Gm. 8 to 10, taken fresh, or Gm. 4 to 6 in the dry state; this property probably resides in the resin. The mesocarp is edible and the juice of the seed is used as an indelible ink for clothes. The fruit is known in the West Indies as alligator pear.

Other species indigenous to Mexico are *Persea drymifolia*, Schiede, known as aguacate olorosa, *P. amplexicaulis*, Sch., *P. pachipoda*, Ehrenb., known as aguacate cimarron, *P. Lique*, Sch., and *P. butyracea*, Sch., known as pagua.

**Aguamiel**, the juice of different species and varieties of *Agave* is yellowish or whitish, mucilaginous, frothy, acidulous and sweet, of an herbaceous odor and a density varying between 1.025 and 1.046. Rio de la Loza found in it sugar 9.55, gum and albumen 0.54, salts 0.73 per cent., the remainder being water, some resinous and albuminous matters, etc. Boussingault found 2.65 levulose, 6.17 sugar, 0.35 malic acid, etc. The juice is used for the manufacture of sugar and of a tolerably good vinegar; its reputed medicinal properties are antiscorbutic and antibleorrhagic.

## TINCTURE DEPOSITS.<sup>1</sup>

By R. A. CRIPPS.

In November, 1883, I had the honor of reading before the "School of Pharmacy Students' Association" a report upon "Tincture Deposits," by which I mean that sediment which is formed in a tincture after filtration. (See "Amer. Jour. Phar.," 1884, p. 101.)

That report included notices of the following tinctures: Tinct. calumbae, cardam. comp., chloroformi comp., cinchonae comp., cinchonae flavae, ferri acetatis, gentianae comp., ipecac., lobeliae inf. aether., quinae and rhei, and it was there shown that the deposits in most of these are of little importance; the two cinchona tinctures and that of acetate of iron being exceptions to the rule.

I now purpose to continue that report, giving the results obtained with a few more deposits received since that time.

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<sup>1</sup> Read at a meeting of the "School of Pharmacy Students' Association." February 5, 1885.

*Tinctura Digitalis*.—The deposit from this tincture is of a pale greyish-green color and small in amount. It was first washed slightly with proof spirit, then digested for a short time with dilute acetic acid, and the solution filtered. The filtrate was only slightly colored, it was shaken twice with chloroform, the chloroformic solution removed by a separatory funnel and evaporated slowly to dryness. The residue was then tested for digitalin by the following method: A few drops of strong sulphuric acid were added to the contents of the dish, and the vapor of bromine applied, a slight violet coloration was produced showing the presence of a small amount of digitalin; but it was very small indeed, quite insufficient for estimation, perhaps 5 per cent. of the whole deposit, which from 1 gallon of the tincture weighed barely 20 grains.

*Tinctura Ferri Acetatis*.—Another sample of this deposit having been sent to me I estimated the amount of ferric oxide it contained; this amounted to 76.44 per cent., showing that the deposit varies in composition, the former sample giving 69.77 per cent. It was similar in appearance to the last, and the quantity obtained from 1 pint was 33 grains.

*Tinctura Lobeliae Ætherea*.—This deposit was similar in appearance to that previously examined, and like it contained no lobeline, but proved to be a fatty body. It is no doubt formed by the slow evaporation of the ether rendering the fat less soluble. Another sample occurred in crystals, but was of the same nature in other respects.

*Tinctura Nucis Vomicae*.—The deposit in this case was very suspicious, being white and in feathery crystals. It was carefully washed with rectified spirit, and the following, tests applied:

1st. Sulphuric acid and bichromate of potash. No reaction for strychnia, only reduction of chromate.

2d. Nitric acid. Only faint yellow color.

3d. Sulphuric acid and gentle heat, an orange-red color, but scarcely like the loganin reaction of Messrs. Dunstan and Short.

4th. Boiling with dilute sulphuric acid, and action upon Fehling. None.

These results being negative, I proceeded to dry some, and in doing so noticed that it melted and gave a greasy stain to paper; this, together with the production of soap with caustic potash, proved it to be nothing but fat. Its melting point was found to be 117°F. From 1/2 gallon of tincture only about 5 grains were obtained.

*Tinctura Opii*.—This deposit was very small indeed, and appeared as little whitish warty masses on the sides of the bottle. They proved to contain neither morphia nor meconic acid.

I have also received some few deposits which, from the very uncertain nature of their active principles, I have been unable to examine; they are *tinct. cascarillae*, from

Messrs. Thresh and Wright, and *tinct. cuspariae and sennae*, from Mr. Want, of Blackheath. I desire to thank these gentlemen and also others who have sent me these deposits. The remaining tinctures of the Pharmacopoeia either deposit so slightly as to be unimportant and to make the examination of them a waste of time, or the drugs are themselves so little known that any examination is impossible.<sup>2</sup>

From the results I have obtained we see that the tinctures of the British Pharmacopoeia remain practically of the same strength for any reasonable time after preparation; that is, in so far as one may judge from the nature of their deposits, although of course changes may occur in the clear liquid by which the amount of active principle may be either raised or lessened, but this is not probable. It may be said on this account that the present tinctures are a satisfactory series of preparations, and if made from drugs of good quality leave nothing to be desired in point of uniformity. But this is a great mistake, for a drug of good quality in one year may be very much stronger than a similar one in the year following, and even in the same year drugs may vary considerably in power and yet be very similar in physical characters. These statements are borne out by the results of Messrs. Braithwaite and Hogg in the case of cinchona, and by Messrs. Dunstan and Short in the case of nux vomica. These instances are especially selected because those experimenters worked upon the tinctures themselves; but much more might be added if we took the results of experiments upon the drugs. Mr. Hogg found in tincture of cinchona from 0.25 per cent. to 0.58 per cent. of total alkaloids, while Mr. Braithwaite's results showed a variation from 0.279 to 0.49 per cent. of total alkaloids, and from 0.070 to 0.345 per cent. of ether-soluble alkaloids. Messrs. Dunstan and Short have shown that tincture of nux vomica is equally liable to variation. Of twelve samples which they examined the total alkaloids varied from .124 to .360 per cent., while the strychnia ranged from .046 to .1.31 per cent.

From these figures, and they might be multiplied almost indefinitely, one draws the very natural conclusion that a series of tinctures standardized to a given percentage of active ingredient is a most desirable addition to pharmacy. But one is here met with the difficulty of determining what constituent of the drug shall be considered the active principle. The alkaloids or glucosides are no doubt by far the most potent constituents, but still they do not fully represent the drug, or there would be no need to use Pharmaceutical preparations at all. There must therefore be some other constituent which modifies the action of the alkaloid, and in most cases this is either unknown or extremely difficult of estimation. This is where analysis fails, and upon this Mr. Schacht has based an argument against standardization. Our present knowledge of drugs, he says, is not sufficiently accurate to justify us in bringing forward such preparations.

But, I ask, are we always to wait till our knowledge is absolutely perfect before we apply it to practical uses? I am afraid that if this were done we should never see the results of any scientific work. Besides, it is a general law of nature that things grow by use; if the child did not use his early power of moving his legs, would he ever learn to walk? If the mind were allowed to run riot and its powers of thought left uncultivated, where would be our mathematicians, scientists or men of business? So with scientific knowledge. Use what we have for practical purposes and it will

<sup>2</sup> I have since received a large deposit from Mr. J. O. Braithwaite which occurred in *tinct. hyoscyami*, the examination of which will shortly be published.

increase in the use. To apply it to the present case: by the practical working out of methods of titration a deeper knowledge of the constitution of a plant must follow, which will most certainly lead step by step to a thorough knowledge of its more indefinite constituents. The alkaloids alone do not represent the full activity of a plant, but it is fairly well established that a specimen containing 1 per cent. of alkaloid is stronger than one containing only .75 per cent., and therefore the activity of a drug may be measured by that alkaloid, since the other constituents are present in both cases.

This applies when there is but one alkaloid, but when there are two or more, as in cinchona or nux vomica, the difficulty is greater. In these cases it would perhaps be safest to standardize the most powerful to a definite amount; but the remaining alkaloids should also be kept within safe limits by the wise discrimination of drugs. For example, in the case of nux vomica tincture, .08 per cent. of strychnia is the average of Messrs. Dunstan and Short's results; but I think the nux vomica should be so chosen as to keep the brucia within the limits of .10 and .15 per cent., the highest and lowest of Mr. Short's being .24 and .075 per cent. The practical difficulties of dilution, etc., urged by Mr. Schacht against standard extracts, cannot be applied to tinctures, since there can be no objection to a little spirit more or less. Mr. Schacht seems rather to indicate that the medical profession does not call for such preparations. If this be the case I wonder at the use of the alkaloids at all; why do they not confine themselves to the old-fashioned infusions and extracts? The very fact of the immense use of alkaloids shows plainly that if standard tinctures and extracts are placed before the medical profession they will be largely and readily prescribed. One would scarcely expect a prescription to be written for standard tincture of opium, for instance, until some firm has brought out such a preparation; the patient could scarcely wait while the chemist devised a method for estimating it.

In regard to standard extracts which, like the tinctures, shall be constant in strength, I have not yet had sufficient experience to speak very strongly as to their feasibility, but I hope soon to be able to show that a series of them is not only desirable but also possible.—*Pharm. Jour. and Trans.*, March 21, 1885, p. 769.

## GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

*A new cotton plant.* The account of which we published an abstract on page 116 of our February number, had been communicated by a correspondent residing in one of the Gulf States. From more recent correspondence we have become satisfied that a hybrid, as there described, between the cotton and okra plants has not been produced.

*Herniaria glabra*, Linné, is recommended by Zeissl in catarrh of the bladder; it is given in the form of infusion, 1 gram being used with the same quantity of *Chenopodium ambrosioides*, Linné, to 1 liter of boiling water. The addition of milk renders the infusion more agreeable.—*Allg. Med. Ztg.*

*Herniaria* belongs to the order Caryophyllaceae, tribe Paronychieae, and grows in

sandy fields throughout the greater portion of Europe and Northern Asia. It is inodorous, has a saline, somewhat astringent and slightly bitter taste, and was formerly employed in dropsy, in diseases of the bladder and kidneys, and in hernia; it has long since fallen into disuse.

*Conium maculatum*, Linné—Lepage corroborates the observations made by Orfila, that the root of this plant contains very little alkaloid. During the spring and summer of the first year, the quantity of alkaloid was very minute, but in September the root contained a larger proportion than could be obtained from roots of the second year's growth.—*Jour. Phar. Chim*, Jan., 1885, p. 10.

*Guaiacum Resin*.—J. S. Ward examined three samples of this resin and reported his results to the Liverpool Chemists' Association, at the meeting held Nov. 6 last. Petroleum spirit had no solvent action. Alcohol dissolved 96.22, 92.96 and 87.28 per cent; ether took up 88.89, 89.91 and 84.12 per cent., and water between 3.00 and 4.66 per cent. The alcoholic and ethereal extracts were found to be soluble in glacial acetic acid, and in liquor potassae, but only partly soluble in chloroform and in ammonia. Two samples of the resin yielded .299 and .334 per cent. of ash, consisting almost wholly of calcium salts, while the third sample, which had yielded least to alcohol and ether, and most to water, gave 6.55 per cent. of ash.—*Phar. Jour. and Trans.*, Nov. 22d, p. 413.

*Rasamalas*.—Mr. E. M. Holmes states that the information obtained from Mr. Jamie seems to confirm Hanbury's statement that this liquid storax is not obtained from the rasamala tree, *Liquidambar Altingiana*, De Candolle. It is imported from Arabia and Persia, and is valued at \$30 per picul (133 1/3 pounds). It is used for scenting clothes and rampah-rampah (spiceries), and for rubbing over the body, also for swollen testicles. It is mostly sent from Bombay to Java. The black and white rasamalas seem to be identical, the latter being probably colored for the market.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 482.

*MyroxylonPereirae*.—The volatile oil distilled from the fruit is described by Mr. E. M. Holmes as being almost colorless and of a sweet odor, recalling the fragrance of a field of beans in blossom. It is slightly altered by exposure to air, the odor approaching that of cedar, wood. A solution of the oil in rectified spirit separates a white precipitate. The oil seems well fitted for use in perfumery, as it is not exactly like any known perfume.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 483.

*Abrus precatorius*, Lin.—The structure of the seeds has been described by W. Tichomiroff in a paper read before the Russian Society of Physicians and Naturalists at Odessa. They contain oil and granular albuminoids, but neither aleurone nor starch, and in the parenchyma sometimes crystals of stearic acid or hesperidin. The testa is composed of four layers, viz., (1) Rods, colorless in the red part, but purple-violet in the black spot; (2) Palisade cells, branching and at the lower end folded and of small diameter; (3) Parenchyma, tangentially elongated; (4) Albumen the cells of the inner layer being flattened radially and at length coalescing into a homogeneous pellicle which cannot be decomposed into its separate cells by maceration in chromic acid, and which swells strongly in caustic potash. The hilum has two layers of rods, and the palisade cells are replaced by sclerenchyma. By chloride of iron the presence

of tannin can be recognized in the albuminous layer and rods.—*Pharm. Jour. and Trans.*, September 6. 1884.

*Terminalia Chebula*, Relzius.—The dried immature fruits furnish the Turkish drug “kara kalileh,” the black myrobalans of old writers. They are shriveled black, bard, 1/3 to 3/4 inch long, with a shining fracture and very astringent taste. Mr. Dickson states that the drug is a mild tonic laxative, in great repute among the Mecca pilgrims, probably because the had is tell them that the Prophet praised its virtues. It should be broken up into a coarse powder and swallowed, has a ligneous bitterish flavor, and in the dose of a drachm acts as a very mild laxative. The Indian Pharmacopoeia mentions the drug as combining mild purgative with carminative and tonic properties.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 483.

*Chinese Rhubarb*.—Mr. Wm. Elborne, Assistant Lecturer on Materia Medica, Owens College, states that Chinese or East Indian rhubarb consists of two varieties, of which one possesses the characteristic white lattice-worked venation with a red grained fracture, while the other possesses a longitudinal ramification of white veins with a black grained fracture. The first variety is referred by the author to *Rheum palmatum*, var. *tanguticum*, from which plant, the author believes, also the highly esteemed extinct Russian and Turkey varieties were obtained. The second variety is yielded by *Rh. officinale*, and agrees in all essential characters with the roots from this species cultivated by Rufus Usher, of Bodicote.—*Phar. Jour. and Trans.*, Dec. 20, 1884, p. 497.

*Sarcocephalus esculentus*, Afzelius, s. *Cephalina esculenta*, Schumacher, nat. ord. Cinchonaceae, grows from Senegambia to the Gaboon, from 16° N. lat. to 5° S. lat., and is known in the Sousou tongue as “doundake,” in the Toucouleur as “jadali,” in the Bassa country as “dorg,” and in Sierra Leone as “amelliky.” The root is sometimes exported from West Africa under the name of *peach root*. Heckell and Schlagdenhauffen consider it valuable as an astringent and febrifuge and as a yellow dye. The bark is sometimes mixed with the bark of *Morinda citrifolia*, Lin., *M. longiflora*, G. Don, and *M. Doundakee*, Heckel, the latter being regarded by Oliver as a variety of the second species. Doundake bark from Sierra Leone, when young, is grayish, smooth, somewhat fissured, and has small, hard, distant excrescences of a darker color; older bark becomes more blackish, the cracks multiply and the epidermis falls off as a reddish dust; the inner surface is ochrey yellow and striated longitudinally; the liber fibres separate easily in lamellae; the bark has a bitter taste and tinges the saliva yellow, while the corky layer is astringent only. Doundake bark from Boké (Rio Nuñez) differs in the absence of the blackish excrescences, the inner surface is of a darker yellow, the outer layer is less astringent and the liber is more bitter, but the anatomical structure is identical. The authors have not been able to obtain the alkaloidal principle indicated by Bochefontaine, Féris and Marcus, but have found the bitterness to be due to two nitrogenous coloring principles of a resinoid character, differing in their solubility in alcohol and water and having the formulas  $C_{28}H_{19}NO_{13}$  and  $C_{19}H_{16}NO_9$ ; the other constituents found are glucose, traces of tannin and a tasteless principle soluble in potassa. The morindas yield a bitter and astringent bark.—*Phar. Jour. and Trans.*, Jan. 31, 1885, p. 614; *Compt. Rend.*, C., 69.

*Hedychium spicatum*.—Nat. ord. Zingiberaceae.—The plant is a native of the

Himalayas, and the rhizome is known in Hindoostan as *kafur-kachri* or *kapur-kachri*, and is kept dried in slices which are 1/2 to 3/8 inch in diameter and from 1/4 to 3/8 inch in thickness. The transverse section is white and starchy and exhibits a large central portion, containing scattered minute vascular bundles, and separated by a faint line from the cortical portion. Externally the pieces are covered with a tough, wrinkled, reddish-brown epidermal layer. The taste is aromatic and slightly pungent. The odor may be described as intermediate between storax and rhubarb.

A proximate analysis, made by John C. Thresh, gave the following results: soluble in petroleum ether 5.9, soluble in alcohol (indifferent substance precipitated by tannin, acid resin, etc.) 2.7, glucoside or sugar 1.0, mucilage 2.8, albuminoids and organic acid 1.9, starch 52.3, moisture 13.6, ash 4.6, cellulose, etc., 15.2 per cent.

The benzoin extract yielded colorless, inodorous, tabular crystals which appear to be ethyl-methyl-paracoumaric acid, 2.9 parts of the extract consisted of fat with the odorous principle; a minute portion of this oily liquid dropped upon clothes renders them highly odorous for a considerable length of time, the odor recalling that of hyacinths.—*Phar. Jour. and Trans.*, Nov. 8, 1884, p. 361.

## THE ACTIVE PRINCIPLE, OF INDIAN HEMP.<sup>3</sup>

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One of the most serious drawbacks to the medicinal use of this powerful drug (*Cannabis Indica*) is that we cannot depend upon its preparations being possessed of activity; moreover, the large amount of resin in each dose is often productive of gastric disturbance. These objections would at once be overcome were we able to extract from the resin its active principle.

Since 1839, when Sir W. O'Shaughnessy, of Calcutta, brought the peculiar properties of Indian hemp prominently to the notice of the medical world,<sup>4</sup> several attempts have been made to isolate the active principle of the plant with remarkably conflicting results.

In 1846, Smith<sup>5</sup> separated a resin which he called "cannabin," and which he believed to be the active principle; and said that it possessed much narcotic activity. No subsequent observers, however, have been able to obtain by the process employed by Smith, any body which fully answers to the description of Smith's "cannabin."

In 1857, Personn<sup>6</sup> resolved the volatile oil, obtained by distillation of the plant, with water, into cannabene (C<sub>18</sub>H<sub>20</sub>) a light hydrocarbon, and a solid crystalline hydride of

<sup>3</sup> From the *Indian Medical Gazette*

<sup>4</sup> "On Indian Hemp or Gunjah," Calcutta, 1839; also "Bengal Dispensatory," Calcutta, 1842, pp. 579-601.

<sup>5</sup> *Pharm. Journ.*, vol. vi., p. 171. In *Ph. Jour.* April 18, 1885, Thos. Smith describes the effects upon himself of his cannabin, and states that it was not a simple principle and after keeping for three years, had become inert.

<sup>6</sup> *Journal de Pharm.*, xxxix., p. 48.

cannabene (C<sub>18</sub>H<sub>22</sub>). He states that inhalation of the vapor of cannabene produces a powerful physiological effect, and he claims it as being the sole active principle of Indian hemp.

In 1876, Preobraschensky,<sup>7</sup> operating on “hashish” got from Turkestan, asserted that the active principle was not a resin, but an alkaloidal body, which he recognized as nicotine, the volatile liquid alkaloid of tobacco. It has been suggested that the presence of nicotine might be due to the hemp having been mixed, as it sometimes is in the bazaars, with tobacco, but Preobraschensky states that he obtained this nicotine from the flowering tops of the plants as well as from the commercial resin.

Merck, of Darmstadt, applies the term “cannabin tannin” to a glucoside contained in Indian hemp which he has combined with tannin. This preparation is not possessed of powerful activity, and frequently is inactive. By treating this tannin compound with zinc oxide Herr Bombelon obtained a substance which he named “cannabinum,” as a greenish-brown powder not agglutinating upon exposure to the air and volatilizing without residue on platinum foil.<sup>8</sup>

In 1881, Siebold and Bradbury reported to the British Pharmaceutical Conference that Indian hemp does contain a volatile alkaloid which, however, does not possess the characters of nicotine. They called it “cannabinine” and obtained only 2 grains from 10 pounds of hemp. They do not appear to have tested its action physiologically, and so have left it undetermined whether this volatile alkaloid be really the narcotic principle of hemp.

The above chemists thus obtained widely different bodies, yet each individually believed that the substance which he isolated represented the active principle of the drug. With the subject thus involved, and having at hand a supply of fresh and active hemp, we undertook an examination of the plant in the endeavor to isolate its active principle. Since commencing our observations, Dr. Matthew Hay has reported<sup>9</sup> that he has isolated an alkaloid in the form of colorless, needle-like crystals, which, however, did not possess the narcotic properties of the plant, but produced tetanus in frogs in exactly the same manner as strychnine-though not chemically identical with it. Dr. Hay, therefore, called this alkaloid “tetano-cannabin.” It must exist in the plant in exceedingly minute traces, for only a few grains were obtained from 1 kilogramme of hemp. He considers it a secondary alkaloid of the plant, and not the chief active principle. We have specially investigated this point as to whether the plant contains an alkaloid with tetanizing properties.

The following is a preliminary note of some of our results: One thousand grams of the flowering tops and leaves of Indian hemp of ascertained activity were roughly powdered and then moistened with 1 litre of a 5 per cent. solution of sulphuric acid and allowed to digest at a temperature of 68°F. This mixture was then packed in a percolator and percolated with about 1 litre of distilled water till the fluid which passed through was colorless.

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<sup>7</sup> *Pharm. Zeitsch. f. Russland*, p. 705.

<sup>8</sup> *Pharm. Zeit.*, May 10, 1884.

<sup>9</sup> *Pharm. Journ.*, 1883, p. 998.

This fluid, after filtration, measured 11 litres, and was of a dark sherry color, smelling very strongly of the characteristic odor of the plant. Carbonate of lime was added to neutralize the free acid, and carbonate of soda solution to render it alkaline. On the addition of the soda a copious precipitate fell down. The unfiltered mixture was then well agitated with ether; and this ethereal layer, which ought to contain any alkaloidal body soluble in ether, was afterwards drawn off and allowed to evaporate spontaneously.

The subjacent liquid which remained after removal of the ethereal layer was evaporated on the water-bath to dryness and then boiled with absolute alcohol and filtered, and the filtrate evaporated on the water-bath. This ought to contain Hay's tetano-cannabin, which is freely soluble in alcohol, but sparingly so in ether.

The ethereal layer, yielded on evaporation about half a gram of a yellowish-brown extract which was insoluble in water, but soluble in a weak solution of carbonate of soda. Of this extract 0.25 grain was injected into the stomach of a young cat without the slightest effect.

The alcoholic solution yielded about 3 grams of a dark greenish-brown extract with a very fragrant aromatic odor. The whole of this was rubbed up well with water and carbonate of soda solution (Hay's alkaloid is "easily soluble in water"); and frequently shaken tip with ether. The ethereal layer was then siphoned off and the ether driven off by evaporation on the water-bath, giving about .2 of a grain of an amorphous light brown substance, which was soluble in about twenty times its weight of distilled water. This watery solution was neutral in reaction. Half of it was injected hypodermically into the thigh of a, cat without any positive result.

It will thus be seen that although operating on so large a quantity of the plant of ascertained activity, we were unable to find any evidence of the existence of such a principle as Dr. Hay describes.

As many of those addicted to the hashish form of intemperance obtain the intoxicating effects by smoking the plant in a pipe, it is to be expected that destructive distillation of the freshly prepared resin might yield up the active principle. This process was, therefore, resorted to. By the destructive distillation of the freshly prepared alcoholic extract of the plant to which an excess of caustic potash solution had been added, an amber colored oil was obtained, which, by exposure to the air or the action of alkalies, rapidly became of a dark reddish-brown color. This oil had a mildly empyreumatic odor which was distinctly tobacco-like. Its taste was warm, aromatic and somewhat terebinthinate. The oil contained phenol, ammonia and several other of the usual products of destructive distillation.

The nicotine-like principle contained in this oil appeared to be alkaloid. It formed salts which evolved a strong nicotine-like odor when acted on by alkalies. But physiologically it was found to be inert, and, therefore, was evidently not identical with nicotine.

The oil as a whole was also found to be devoid of any narcotic or irritant qualities. About one-eighth of an ounce was introduced into the stomach of a cat without

producing any sensible effect. These results do not coincide with those of Personne, who asserted that the active principle of the plant resided in the volatile oil. It is just possible that the active principle was decomposed by the high temperature necessary for destructive distillation.

The principle which represents the full activity of the plant has yet to be isolated. If the active principle be a body which is actually distinct from the resin, the fact of its being so intimately associated with the resin renders its separation a matter of peculiar difficulty, for it is remarkably difficult to deal chemically with resinous compounds.—*Phar. Jour. and Trans.*, January 17, 1885, p. 574.

## VARIETIES.

QUEBRACHO.—Drs. Huchard and Eloy, of Blois, affirm that the six alkaloids of Quebracho reduce temperature in fevers even more effectually than quinine. Such a result is obtained in typhoid by the hypodermic injection of gr. 1 1/2 to 3 of muriate of aspidospermine.—*Pacific Med. and Surg. Jour.*, April, 1885.

VALUE OF CONVALLARIA MAJALIS.—The glitter of novelty is wearing away, and after two or three years of universal praise we find that Lily of the Valley is exciting some doubts as to its medical value. Leubascher affirms that grains 1/7 of convallarin produces paralysis and loss of reflex activity in frogs, and in animals a progressive fall of arterial pressure, with slowing of the pulse and final diastolic arrest of the heart. Pel. Leyden and Stiller agree with Leubascher in finding no therapeutic utility in its employment. Prof. E. T. Bruen, in our own country, says that it can be employed with reasonable confidence in functional cardiac disorders and in mitral obstruction, and that, in comparison with digitalis, it acts more as a cardiac regulator, but much less as a cardiac stimulant.—*Therapeutic Gazette; Pacif. Med. and Surg. Jour.*, April, 1885.