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Botanical Medicine Monographs and Sundry

GLEANINGS FROM THE GERMAN JOURNALS.

By FRANK X. MOERK, PH. G.

Identification of Tinctures.—L. von Itallie has published tests of identity for the following tinctures :

Tincture of Aloes.—If this tincture be agitated with ether, and to the separated ethereal solution water of ammonia added, a red-violet coloration results.

Tincture of Calumba.—The yellowish-green residue obtained by evaporating a little of the tincture is dissolved in dilute hydrochloric acid, and if to this solution is added a small quantity of chlorine or bromine water, a light-red color is produced.

Tincture of Cinchona.—Two grams are precipitated by solution ,of lead subacetate, filtered, evaporated, the residue dissolved in water, a few drops of sulphuric acid added, and again filtered. The filtrate is tested for quinine or quinidine by the thalleioquin test.

Tincture of Colchicum.—Three grams are evaporated, the residue dissolved in water, the solution filtered, the filtrate agitated with chloroform, and the chloroformic solution evaporated; the residue with nitric acid, will be colored violet, changing to brown, on addition of potassium hydrate solution, becoming orange colored.

Tincture of Digitalis—Five grams are evaporated, 2 cc. water added, and precipitated with a small quantity of solution of lead acetate. After filtering the filtrate is agitated with chloroform, and to the residue, after the chloroformic solution has evaporated, is added a little sulphuric acid and a few drops of bromine water; a violet coloration appears.

Tincture of Gelsemium.—One gram is evaporated, 1 cc. acidulated water added, filtered, the filtrate rendered alkaline with water of ammonia and shaken with chloroform. Gelsemine remains upon evaporation of the chloroformic solution, which, with sulphuric acid and potassium bichromate, yields a red-violet color. The alkaline solution (after the removal of the chloroform solution) diluted with water possesses a blue fluorescence.

Tincture of Guaiac is colored blue by oxidizing agents; a blue color is also obtained upon addition. of cupric sulphate and bitter almond water.

Tincture of ipecac is evaporated, the residue taken up with acidulated water, filtered, made alkaline with potassium hydrate solution and shaken with ether. The residue from the ethereal solution gives a brown color, with a solution of ammonium molybdate in concentrated sulphuric acid, and upon the immediate addition of a drop of hydrochloric acid, a blue color soon appears.

Tincture of Jalap yields a residue turning red with sulphuric acid.

Tincture of Nux Vomica evaporated with dilute sulphuric acid gives a violet color; the residue treated with water, filtered, the filtrate made alkaline and extracted with chloroform, leaves a purified residue upon the evaporation of the chloroform, which with nitric acid is, colored red, or with concentrated sulphuric acid and potassium bichromate, assumes a violet color.

Tincture of Quebracho, 5 grams are evaporated, the residue dissolved in acidulated water, filtered, rendered alkaline with potassium hydrate and agitated with chloroform; the chloroform residue is colored blue by sulphuric acid and potassium bichromate, or a red color is produced by boiling with dilute sulphuric acid and adding potassium chlorate.—(*Apoth. Ztg.*); *Rundschau*, 1889, 714.

BALSAMODENDRON BERRYL[1]

BY DAVID HOOPER.

Buchanan's interesting “Journey through Mysore, Canara and Malabar” mentions (p. 8, vol. ii.) a species of myrrh about which little is known. “Many of the hedges here and in other parts of Coimbatore, are made of a thorn called *Mulukilivary*. It seems from its habits to be a Rhus; but not having found the fructification, I am very uncertain concerning its place in the botanical system. It makes a very good fence; cuttings three or four cubits long are put into the ground between March 12 and April 10. The ends are buried in the earth about a span, and very soon shoot out roots. From the moment it is planted it forms a fence against cattle; but seems to require a better soil than either *Euphorbium Tirucalli* or *E. Antiquorum*, which are the most common hedges here, and will grow anywhere.”

The Mulukilivary in the above extract is the *Balsamodendron Berryi*, Arnot, and Coimbatore, the habitat of the plant, is a district lying to the south of the Nilgiri Hills. Hearing that a gum resin similar to the official myrrh could be obtained from this shrub, inquiry was made for samples and for information respecting it. The District Forest Officer of North Coimbatore forwarded me a sample of the gum-resin in October last, and furnished the following information. The gum-resin is used here by the natives medicinally. It is not collected for commercial purposes. It may be more abundantly procurable between the months of February and July. The cost of collection would come to Rs. 4 per maund (of 25 lbs.). The District Forest Officer of South Coimbatore sent me a sample rather inferior to the first, pointing out that the exudation was not used by the natives in the district in medicine or the arts, nor was it collected for commercial purposes.

[1] *Balsamodendron* = *Bursera* - MM

The gum-resin was in pale yellow, yellowish-brown, or brown translucent fragments, tough, and breaking with a shining conchoidal fracture. The surface had an oily appearance, and when scratched or rubbed with some bard implement showed milk-white markings. Pieces of reddish-brown bark were attached to some fragments, and others were adhering to cloth in which it had been collected. Powder was of a dirty white color, and when rubbed up with water made a thin emulsion. The odor was oily, not fragrant. Colonel Beddome alludes, however, to an aroma given off by the plant. The taste was simply mucilaginous. It dissolves for the most part in water, leaving a few flocks of soft resin and impurities undissolved.

A selected sample of the gum-resin gave to water 84 per cent. of gum; it contained 5 per cent. of moisture and 6.6 per cent. of mineral matter. The gum was gelatinized by ferric chloride, and like that from true myrrh, was not precipitated by neutral plumbic acetate. The resin was soft, transparent, tasteless, odorless and neutral in reaction. It was soluble in alcohol, ether, bisulphide of carbon and chloroform. The solution in alcohol was not colored by ferric chloride, and gave a right-handed rotation when examined with polarized light. The resin moistened with alcohol gave no color with concentrated nitric or hydrochloric acid, and no violet liquid was obtained when bromine was added to its solution in carbon bisulphide. The resin separated by alcohol and evaporated was exposed to the heat of a water bath for a week and remained soft and tenacious; after this it was exposed to the air for about two months, but its consistence was not altered, and when examined under the microscope it was seen to be perfectly amorphous.

The myrrh from the *Mulukilivary* is evidently distinct from the true myrrh, Arabian myrrh and *Bissa Bol*. Its freedom from bitterness and fragrance would render it unfit as a substitute for the genuine drug and useless as a medicinal agent. It gives off no odor when burnt, and is therefore unsuitable as an ingredient in incense. It forms a good adhesive mucilage, and might be used as a convenient addition to some kinds of confectionery. An allied species of myrrh yielding a similar exudation is the *Balsamodendron pubescens*, growing in Beluchistan, and remarkable for the large proportion of gum in the gum resin.—*Pharm. Jour. and Trans.*, Aug. 24, 1889, p. 143.

THE CULTIVATION OF MEDICINAL PLANTS IN CAMBRIDGESHIRE.

By E. M. HOLMES, F.L.S.,
Curator of the Museum of the Pharmaceutical Society of Great Britain.

Having been informed that a portion of the aconite leaves used in commerce is grown in Cambridgeshire, and being desirous of determining how far the plants grown in the same district, as well as in different counties, vary in character, I obtained permission from Mr. W. Moore, of Foxton, who is apparently the largest grower of this plant in Cambridgeshire, to examine the plant grown by him, when in blossom. On arriving at Foxton, I found that besides aconite, belladonna and henbane are also grown by Mr. Moore; only seven acres out of a large farm being devoted to these three medicinal plants, the usual proportion being about three acres each of henbane and belladonna,

to one of aconite. A little foxglove is also grown. The cultivation has now been carried on at Foxton for about thirty years. The soil is apparently a mixture of chalk and gravel, with a little clay.

Aconite.—This is planted in rows about two feet apart, and about one foot between each plant. The fresh plantations are generally made in March soon after the leaves appear, when the young plants are divided and planted out. Mr. Moore assures me that young plants are formed on the rootlets, as represented in Bentley and Trimen's illustration, and also at the bases of such stems as lay on the ground. This prolific formation of new roots may possibly arise from the fact that the aconite is usually cut down in the middle of June, when the flowers have begun to open, and the store of nourishment that would have gone to form seeds is probably diverted to forming roots. There does not appear to be any regular demand for aconite root of English growth, and to meet such demand as exists, a few roots are dug up in autumn, generally in October, and dried.

At the time I visited Foxton the plants were in perfection, about half of the flowers being expanded. The leaves were of a full dark green, and the flowers of a deep blue color. The helmet was not quite so semicircular as in the typical *Aconitum Napellus*, and the inflorescence showed a general tendency to branching. The whole of the plants, however, manifested a remarkable uniformity, were of very robust growth, and were flowering at the proper date, and the leaves possessed the characteristic taste of aconite. This uniformity is due to the fact that Mr. Moore never sows the seed, but always divides the root. Indeed, the plant is cut for making extract while still in flower, and therefore before the seed is formed. Mr. Moore does not, however, make the extract himself, but sends the fresh plant, packed like faggots, to London, The aconite is usually cut overnight and sent off by an early morning train, so as to prevent as far as possible any withering by exposure to the hot sun.

Although the plant is slightly divergent from the typical *A. Napellus*, it possesses the great advantage of uniformity, and the root obtained from it would be therefore far more dependable than the foreign root either for use in medicine or for chemical analysis.

Henbane.—This is sown in March or in the beginning of April, and is cut about the middle of June in the next year. For drying only the flowering tops are collected,not the stem leaves, and are rapidly dried in hot air in a kiln, in which about 2 to 4 cwt. can be dried in two days. The soil does not appear so well suited for henbane as the deep rich fen land of Lincolnshire, and the plant is frequently attacked in dry seasons with a fungus which causes wrinkling and discolored spots on the leaves. Here, as elsewhere, henbane is a very uncertain crop, three out of five seasons usually failing to afford a profitable return. The plant, beside being attacked by the fungus, has its leaves riddled with a little beetle resembling the turnip flea, and in the autumn a voracious grub, apparently that of *Mamestra brassicae*, eats out the central leaf bud of the plant, so that they do not come up the second year. In the autumn the large root leaves are sometimes collected and dried, and are sold under the name of “First cutting of biennial plant,” at a lower price than the flowering tops of the second year.

The variety cultivated at Foxton was obtained from wild plants found near Foxton,

and has the broad leaf so characteristic of the wild henbane, as distinguished from the narrow thistle-like form cultivated in some counties. No use is made of the henbane roots, although it is hardly conceivable that they should not contain a sufficient amount of alkaloid to pay for extraction.

Belladonna.—This is grown from seed which is drilled in during the spring. The ground suits the plant admirably, being chalky, and although level is sufficiently porous to ensure the requisite drainage. It is, however, exposed to the full force of east winds, and hence the frosts, if late, are apt to injure it in spring, when it is about 1 ft. or $1^1/_2$ ft. high. Later on it is in some seasons much attacked by green fly, which causes the leaves to packer and wither. This generally takes place in the beginning of June.

The plant is usually sold in the green state for extract making, and the leaves are not dried. The plant is cut about the end of June. The second and third year afford the best crop of leaves, and the fourth year the roots are dug up and dried and the seed is sown in another locality. The first year after sowing, the leaves are not fit to cut, so that practically there are only three years during which the plants yield a crop.

Foxglove.—This is only cultivated on a small scale, as the wild plant is largely collected elsewhere for the purpose. The leaves are generally gathered in June from the biennial growth before the flowers have expanded.

In conclusion, I wish to take this opportunity of expressing My thanks to Mr. Moore for the liberal manner in which he has afforded information concerning the details of cultivation, etc., of the abovementioned plants.—*Phar. Jour. and Trans.*, Aug. 17, p. 122.

MANUFACTURE OF PEEL ESSENCES.

Italy has always been the home of the orange and those of its congeners from which we derive the essences, such as lemon, bergamot and cedron, which are of so great importance in the perfumery and beverage industries. It might have been expected that the Paris Exhibition would have contained a more representative as well as a greater number of exhibits in this class than it does. But although we were somewhat disappointed on this score, we were at least pleased to note one or two exhibits of a very superior character in the Italian Court, and we were fortunate in meeting an attendant at one of them who displayed a remarkable amount of enthusiasm regarding his native industry, and who was commendably liberal. in meeting our request for some information regarding his methods of working. This gentleman was Mr. C. Rizzuto, of Reggio-de-Calabre, an Italian town of 37,000 inhabitants situated opposite Messina. Mr. Rizzuto is senior partner in the firm of C. Rizzuto et Fils, whose manufactures, in conjunction with those of Francoia Genoese Labocetta, a relation, are exhibited by Pierro Merlino et Fils Cadet, of 67 Rue d'Hauteville, Paris, in the Italian Court of the Exhibition.

Mr. Rizzuto is a typical specimen of the robust Italian, grizzled by the hardships of the Garibaldian campaigns and the wars under Victor Emmanuel which gave Italy

her freedom. A tough old soldier he is, bearing still the scars of wounds received when serving his country. But it is of his manufactures rather than his personality that we have to report. He tells us that the finest products are made by the old-fashioned sponge method, such as Mr. F. W. Warrick briefly described in a paper which we published last year. This method is very simple, and is used for the production of the finest essences. There are, we may state, nine different varieties or odors, lemon and bergamot being the chief. The trade names under which these varieties go are: "Bergamote," "Bergamote dorée (mûre)," "Bergamote extrait à la main," "Citron (limone)," "Citron vert (cru)," "Portugal," "Portugal muscade," "Bigarade," "Mandarine," "Limette," " Cédrin (cédrino)," and "Cédrat (cédrone)." By "à la main" is meant the sponge process, which consists simply of taking the whole fruit, dividing it into four parts, and pressing the external part of the peel against a sponge, which sucks up the essence as it is ejected from the oil sacs. Although this is a very primitive process the essences which are obtained by it are far and away the best, but the loss of essence is so great and the process so tedious that it is only applicable for those products which fetch a good price. Still, Mr. Rizzuto told us several famous perfumers will only use lemon, bergamot, etc., prepared in this way; and King Humbert, who has a liking for a single drop of "Cédrino" in his coffee, gets the à la main essence, costing 110 francs per kilo. in first hands. This flavor is also much used for ices.

For ordinary commercial purposes the essences are pressed out of the peel by means of a machine, which is entirely constructed of wood, saving the handle which turns the wheel. Contact with metal seriously affects the quality of the essence. The machine stands about 4 feet in height, and its structure is simple. The whole fruits are placed under the central circular portion, where the lower and upper surfaces are corrugated so as to press the peel unequally in order to break the oil sacs. The expressed essence is collected in a vessel below, and after settling for some time it is filtered through felt bags. Essences prepared by this method are what are known in commerce as the finest, those made by the sponge process being scarcely regarded as "commercial," their high price necessarily confining their use to those who specially order them. But it is, of course, possible to have different qualities of the machine-made essences, as quality greatly depends upon the condition of the fruit.

There is still some doubt existing regarding the characters which true essence of bergamot ought to present. Some say it should be brownish-yellow, pale yellow (as lemon is), or green. It is the last color that druggists are most familiar with, and addressing Mr. Rizzuto on this point, we asked him what he thought about it. His reply was given in Calabrian French, and its expressiveness is lost in putting it down in cool English, but it had in it a wholesome repugnance towards much of the green essence which is in the market. Bergamot fruit, he told us, ripens in January, and at that stage the essence which it yields is golden in color, and of very fine bouquet, but much weaker, or, as Mr. Rizzuto put it, not so strong in odor as the essence made from the green fruit in November. That essence is of course green, as it is pressed from the fruit and retains the color after filtration. At this point we inspected specimens of both kinds, amongst them essences made in the 1884 and 1885 seasons, which are still fresh, odorous, and perfectly free from terebinthinate taint. Mr. Rizzuto explained that the keeping properties are entirely due to the fruit being carefully selected and equally carefully expressed. "What becomes of the spoilt fruit?"

was the question which naturally followed this explanation. “It is used for making the ordinary green essence. It is done in this way.” And here Mr. Rizzuto submitted a photograph of the apparatus, which consists of three parts: (1) a boiler, (2) a still, and (3) a condenser. The bergamot peel is placed in the still, which is provided with a false bottom. The boiler is for the production of steam, which is passed into the still, from the bottom of which it rises, carrying with it the essential oil, and this is duly condensed and separated from the aqueous portion. The essence so obtained is of inferior odor and is water-white. Before it can possibly be placed on the market as green bergamot it must be skillfully “doctored,” both to bring up the color and the odor. Copper is the colorant. It is remarkable how easily the peel essences take up copper. Lemon becomes quite green in a day if a few chips of bright copper are immersed in it, and all the others take up the metal equally readily. Body is given to the distilled essences by adding artificial perfumes, such as the paraffin ethers, to them; and it is at this stage that sophistication sometimes takes place.

It may be useful to state here what Mr. Rizzuto considers to be the common adulterant of bergamot. First, there is the adulteration of the true expressed essence with the distilled oil. It is practically impossible to detect this admixture, as the distilled oil only reveals itself in the course of time by its terebinthinate odor. The second class of adulterants comprises rectified petroleum, turpentine, and olive oil, and which are easily detected by shaking one volume of the essence with four volumes of alcohol (S. V. R. 6, water 1), and after an hour the adulterant, if any is present, sinks to the bottom. This method is not applicable, however, to lemon and the other essences, the purity of which may be judged roughly by mixing a few drops with a morsel of sugar, and judging the odor and taste in comparison with a standard sample. One of the most lamentable features of this industry is that adulteration is not only openly practiced, but is considered to be indispensable. At first sight the reason for this does not seem to be clear, but when we keep in mind the very large number of people engaged in it, and the consequent competition, it is not so surprising. The truth is, indeed, that manufacturers have to “meet” the market. Mr. Rizzuto was careful to explain to us that his connection with the distilled oils goes only so far as their sale in the state that they are produced in by distillation. Yet the demand for “fabricated” essences he believes to be enormous. This is directly traceable to consumers, especially aërated-water makers who sell lemonade at 10d. or 1s. per dozen. Cheap essence of lemon appears to be necessary for that; yet it would be better to pay 10s. or 12s. per lb. for a pure lemon than 4s. or 5s. for an article heavily loaded with turpentine or petroleum. A little of the pure essence gives a good flavor, whereas more of a sophisticated essence destroys the lemon and imparts a foreign flavor. And what is true of beverages ought to be doubly so, if that were possible, in regard to perfumes, for after all the nose is the best analyst, the most delicate sense which we have, and anything indefinite or foreign in the components of a perfume is apt to throw the whole compound out of gear, and to destroy what might otherwise be a delicious and refreshing odor.—*The Chemist and Druggist*, Aug. 24, p. 269.

British Pharmaceutical Conference.

On the Root Bark of Euonymus atropurpureus, by Messrs. W. A. H. Naylor and E. M. Chaplin. This paper represented the useful class of work which consists in repeating the experiments of previous observers. In this instance the authors regulated their

proceedings by the experiments on euonymus root bark made by Mr. W. T. Wenzell, as recorded by him in a paper published in the AMERICAN JOURNAL OF PHARMACY in 1862. They report that they have separated from the bark an unidentified crystallizable glucosidal principle, to which they have given the name "atropurpurin," Wenzell's "euonymin," citric, tartaric and malic acids, neutral fixed oil, crystalline free fatty acid or acids, an acrid and pungent principle, yellow and brown resins, bitter extractive and wax. Their results differ from Wenzell's chiefly in that instead of asparagin they obtained atropurpurin, which contains no nitrogen; besides which they got bitter extract instead of a soft resin, free fatty acid in place of crystalline resin, brown resin soluble instead of insoluble in ether, and an acrid pungent principle that Wenzell failed to detect.

Lemon Juice.—The official standard of the citricity of lemon juice was the subject of the next paper, in which Mr. T. Howell Williams expressed the opinion that this is now fixed much too high. In the B.P., 1867, the specific gravity was stated as 1.039 and the contents of a fluidounce in citric acid as 32.5 grains; in the B. P., 1885, the specific gravity is given as 1.035 to 1.045 and the citric acid as 36 grains to 46 grains to the fluidounce. In Mr. Williams' opinion, 30 to 36 grains of citric acid in the ounce would more correctly represent the amount present in the lemon juice as commonly obtained from the finest imported fruit during the winter months, and from 20 to 30 grains when the juice is pressed in summer and autumn. In support of this opinion be quoted some memoranda from the laboratory books of his firm.

Wild Cherry Bark.—The next paper, by Mr. L. W. Hawkins, dealt with the subject of the amount of hydrocyanic acid occurring in wild cherry bark and the proportion of this which finds its way into pharmaceutical preparations of the bark. Six samples of bark from leading houses, examined by distilling the finely powdered drug with water and titrating the distillate with centinormal silver nitrate solution, gave results corresponding to a yield of hydrocyanic acid ranging from 0.079 per cent. to 0.160 per cent. The preparations in use are the liquid extract, infusion and syrup of the U.S.P. and the tincture of the B.P.C. Formulary. Commercial specimens of the liquid extract, which is supposed to represent its weight of bark, gave very poor results, the highest quantity of hydrocyanic acid in any of six samples being 0.030 grams in 100 cc., and in two cases none at all. A sample made. by the author strictly according to the U.S.P. formula from a bark containing 0.137 of acid only contained in the finished product 0.084 per cent., apparently showing that the portion of the menstruum not subjected to the influence of heat is insufficient to extract the whole of this constituent. Commercial samples of the infusion and syrup also gave results considerably below the theoretical quantity, supposing that they were made from average quality bark, although it was demonstrated that a much nearer approximation could be obtained by following the U.S.P. processes. A similar remark applies to commercial samples of the tinctura pruni virginianae B.P.C. The author, therefore, drew the conclusions that preparations of wild cherry bark do not, as a rule, represent the full value of the drug, so far as hydrocyanic acid, its supposed active constituent, is concerned, and that this might be caused by loss of acid in keeping or insufficient care in preparation.

Concentrated Infusion of Gentian.—Mr. Johnston raised the old vexed question of concentrated infusions, with a view to the introduction of such preparations in the

next edition of the British Pharmacopoeia. In order to give a practical turn to the discussion, he suggested the following formula for a concentrated infusion of gentian :

"Take of—

Bitter orange peel, bruised	of each, 3 ounces.
Gentian root, bruised	
Fresh lemon peel	6 ounces.
Rectified spirit	7½ fluidounces
Cold distilled water	15 ounces.
Boiling distilled water	A sufficiency.

Mix the orange peel and gentian root with the spirit and cold water, and, into the mixture contained in a suitable vessel, such as a wide-mouthed jar to which a bung can be fitted, grate the lemon peel. Macerate for seven days, stirring occasionally: strain through a press bag or piece of calico, and press out the rest of the infusion. Remacerate the mare with about twelve ounces of boiling distilled water for twelve hours, and again press Mix the liquid obtained with the previous portions, and set aside for a few days, afterwards filtering and making up with distilled water to a pint and a half."

In respect to the lemon peel, it was recommended that the yellow portion should be grated from previously weighed lemons (about six will be required) directly into the liquor, and as much of the spongy part as may contain essential oil pared off and added also, the quantity being checked by noting the loss of weight in the lemons. Such a preparation. when mixed with seven parts of distilled water, was stated to yield a liquid exactly the same in color, aroma and bitterness as the freshly-made B.P. infusion. Recognizing the possibility of an objection that the formula would yield a weak tincture rather than an infusion, Mr. Johnston thought this would be hypercritical, and suggested that where the physician wanted to avoid even this quantity of alcohol he might order "inf. gent. co. recent." It was admitted, however, that all the infusions might not be so easily represented by concentrated preparations.

Tincture of Lemons,-As a sequence to the previous paper, Mr. Johnston sent a note suggesting a modification in the official formulae for the tincture of lemon and tincture of fresh orange peel, which consisted practically in adopting the method proposed for grating the peel.

On Casearia Esculenta—The last paper read was a contribution. from India, being an account, by Dr. Mootooswamy, of Tanjore, of a drug said to be coming into use as a remedy for chronic enlargement of the liver, hepatic obstructions, piles and diabetes. It consists of the root of *Casearia esculenta*, bearing a native name owing its origin to a "supposed property of drying up the sea." According to an analysis by Mr. D. Hooper the root contains 3 per cent. of neutral resins soluble in ether and partly soluble in spirit, an organic acid having the characters of cathartic acid, and about 10 per cent. of a tannin giving a green color with ferric chloride, which, however, does not prevent the drug from acting as an aperient.