

# AMERICAN JOURNAL OF PHARMACY

Volume 59, #2, February, 1887

## Botanical Medicine Monographs and Sundry

### **NOTE ON TINCTURE OF STROPHANTHUS.-**

By W. MARTINDALE.

Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Wednesday, November 17.

The researches of Drs. Fraser and Ringer on strophanthus, the kombé arrow poison, and the publication by the former of his paper, read at the Cardiff Meeting of the British Medical Association (*Brit., Med. Journ.*, vol. ii., 1885, p. 904), have lately attracted much attention to this drug. Unfortunately a supply of it is difficult to obtain. A paper on the species of strophanthus used in medicine was read at the Evening Meeting here on March 10, 1886, by Mr. Holmes, (*Pharm. Journ.*, 1886, p. 778, AM. JOUR. PHAR. 1886, 406). Since then a supply of the drug has been received by Messrs. Christy & Co., and a formula for the tincture has been published by Messrs. Burroughs, Wellcome & Co. (*Pharm. Journ.*, 1886, p. 304, A. J. P. 1886, 405), on the authority of Dr. Fraser. It directs that 1 ounce of the seeds, first deprived of their oil or fat by means of ether, is to be percolated with rectified spirit to produce 8 fluidounces of tincture. As pharmacists have looked with some suspicion on the employment of ether for the extraction of the fixed oils from such drugs before making pharmaceutical preparations of them, for example in the present process for making extract of stramonium and in the now discarded process for making liquid extract of ergot, I therefore wrote to Dr. Fraser pointing this out, stating my fear that some of the activity of the strophanthus seeds might be removed by the ether, and mentioning also that as there was a tendency to decimal proportions for these preparations, I thought that a 1 in 10 tincture would be preferable. I concluded by saying that I should be glad to have a reply from him in corroboration or otherwise of the formula published by the above-mentioned firm. He replies:

“The active principle of strophanthus is practically insoluble in ether, and therefore it is quite a suitable solvent for the oil whose presence is objectionable in the tincture.

“I have used a tincture of various strengths. Seeds alone without hairs 1 in 8 of rectified spirit was adopted because of its being the strength of tinct. of digitalis, and the dose of such a tincture is 2 to 4 minims.

“As this dose is inconveniently small, especially for children, I now generally use a tincture of half the strength, 1 in 16.

“One in 10 would not get over this difficulty. The dose of the tincture of 1 in 16 would, of course, be 4 to 8 minims.

“I have not seen the letter of Burroughs & Wellcome to which you refer.”

He further writes:

“Although the pods contain active principle, the relation of a tincture obtained from them to a tincture from the seeds has not been determined. The two should not therefore be used together. The preparation I have used in therapeutic work has always been the tincture from the seeds. I do not know what the dose would be of a tincture from the combined pods and seeds. I think also the seeds freed from their comose appendices should alone be used. In reference to the preliminary extraction with the ether, it is obvious the ether should be washed to remove spirit.”

This is so far conclusive, and as the results of other therapeutic observers will have to be compared with Dr. Fraser's, when tincture of strophanthus is ordered pharmacists must supply the tincture of the seeds only, deprived of oil. Still, as the drug is scarce and costly it is well that we should examine it and try to utilize all the parts of it that possess activity. While awaiting Dr. Fraser's reply I prepared a little tincture of the bruised natural seeds by percolating one part with rectified spirit *q. s.* to produce 8 fluid parts. It is labelled *a*, is of a yellowish-green color and has a characteristic bitter taste. I did not examine the marc of this to notice if it was exhausted.

Nearly one-half the weight of the pods now offered for sale consists of the linings of the pericarps, one-third (nearly) is seeds, and about one-fifth is hairs.

In preparing Dr. Fraser's tincture, the seeds in coarse powder were percolated with about five times their weight of ether, specific gravity 0.720 (the rectified washed methylated). A deep emerald-green liquid having a claret-colored fluorescence was obtained. It has deposited a small quantity of crystalline sediment. Evaporation of a part of it shows that the seeds yield 27 per cent. of dark green ethereal oil or oily extract, which is very bitter in taste, and only slightly soluble in rectified spirit. After the ether was evaporated from the marc this was again slowly percolated with rectified spirit, 1 to produce 8 parts of yellowish-green colored tincture marked *b*1, but this is much paler than tincture *a*. Percolation was continued fractionally to produce a second 1 in 8 percolate, marked *b* 2, and a third, 1 in 4, marked *b* 3; the last two percolates are practically colorless, but bitter, and although their specific gravity is the same as the spirit used in making them, yet the marc is still bitter. The specific gravity of the first percolate is nine points higher. Mixed, these three percolates would produce a 1 in 20 tincture.

The depurated tincture *b* 1, on addition to water, of course forms; a clear mixture; but tincture *a* only causes a slight opacity when it is mixed with water—very little more than the same quantity of tincture of orange peel would cause.

I also percolated a separate tincture of the powdered pericarp lining, 1 in 8 with rectified spirit, marked *d*. It is pale greenish-yellow in color, has the same but less bitter taste than the tincture *b* 1, and is five points lower in specific gravity. The marc left was still bitter. I likewise prepared a tincture of the hairs 1 in 8, with rectified spirit, marked *c*. It has the yellowish-green color of tincture *a*, and has a similar bitter taste, although according to Messrs. Hardy & Gallois (*Pharm. Jour.*, 1877, p. 756; *Am. Jour. Ph.*, 1877, p. 402) the hairs only contain ineine, a crystalline

principle which has not the same physiological action as strophanthin contained in the seeds; this stops the heart's action when its solution is injected into a frog, which ineine does not.

I give these results of my experiments, expecting to elicit expression of opinion as to what formula might eventually be adopted. The present one, Dr. Fraser himself acknowledges, produces a preparation too concentrated for practical use. As the drug arrives with a variable amount of the pericarp adhering, and this generally in bad condition, and as the hairs are said to possess different properties to the seeds, I think the seeds alone should still be used, as they only can be relied upon to produce an uniform tincture. The other portions possessing activity might be economized for preparing the active principle. Care must be taken in handling the drug and its preparations, as they act as topical irritants, to the mucous membrane particularly.

Since writing the above Dr. Ringer has kindly tried the ethereal oil on frogs for me and finds that although not inert it does not possess much activity, not nearly so much as a 1 per cent. solution of the arrow poison.

Mr. T. R. Bradford, of University College, to whom I gave samples, also writes:—

“I have performed some experiments with the tinctures of the seeds, pods, and hairs, and I find them all active; but that obtained from the hairs is the weakest, and that from the seeds is the strongest in arresting the movements of the frog heart. They are also all of them powerful muscle poisons, particularly the pod tincture, but of course to, decide this more experiments would be necessary.”—*Phar. Jour. and Trans.*, Nov. 20, 1886, p. 411.

## PHARMACY IN INDIA.

Read before the Alumni Association of the Philadelphia College of Pharmacy, January 18th.

LAHORE, INDIA, November 27, 1886.

The subject "Pharmacy in India" is probably one which has not been brought before you, and for this reason I am induced to address you, trusting the characteristics of Indian pharmacy will make up any lack of composition by the writer. In the first place there is no pharmacy law in the country, and any one can engage in the drug business regardless of his knowledge of chemistry. Hence, there are all sorts and conditions of chemist shops from the strictly legitimate shops of Calcutta and Bombay to the native medical halls in the bazaars, where poisons of sorts are on freely sold as Epsom salts. In Calcutta and Bombay the drug stores are on a line with the pavement as at home, but in other cities and stations of India they, as well as all stores, are built in the centre of yards, or, as called here, compounds to which there is an entrance and exit gate. The buildings are all one story with very high ceilings, large airy rooms, the store portion to the front and residence part in the rear. Over the entrance to the store a portico is built on account of the great heat of the sun, which would be felt severely by some persons even in the short space of time occupied by leaving the carriage and entering the store. Around the portico are potted plants, rose bushes, etc., and the entrance is, as a rule, bordered with potted plants. Hence, we have no window display, and the part of an apprentice's life, the flies in the window, is unknown here. Outside of Calcutta and Bombay, there are no strictly chemist businesses; but this is an adjunct to a general store, and as a rule is the best paying branch of the business. The chemistry part of the business takes the lead in the firm's advertisements, as Root & Co., chemists; and general merchants, and this is carried out by merchants whose stock in trade consists of a few auction patent medicines.

The British Pharmacopeia is the standard, but many Indian medicines are prescribed, and there is an Indian Pharmacopoeia which is unofficial. Many American preparations are used and the United States Pharmacopeia is to be found in every drug store. American patent medicines have a very large sale, and among the non-secret preparations Parke, Davis & Co.'s Fluid Extracts and McKesson & Robbins' Capsuled Pills have become best known. The quantity of McKesson & Robbins' Quinine Capsules that are sold is marvellous. Of course this is a country of fevers and malaria, and the perfection which these capsules have reached have impressed themselves on the medical men, and the natives are among the most frequent buyers. To sell them in bottles of one hundred is of very frequent occurrence. The patent medicine trade is large, but it is much hampered by the natives who sell at prices that Europeans cannot touch. Most of the goods of the former are auction goods, such as have been on the shelf until the wrappers become unsightly and are then handed over to the auctioneer. Then the native bears the same relation to the European as the Chinaman to the American; he can live on such a small amount that the profit on one bottle of medicine would keep him in food several days.

Connected with all chemist shops (the term for drug stores) is a manufactory for aerated waters, the sale of which is enormous. Aerated water (carbonic acid water), soda water (with a tinge of bicarbonate of soda), lemonade, gingerade, tonic water

(with a trace of quinine), and potash water are those principally bottled. Soda water is kept in bottles of 14 ounces capacity, and the sweetened waters in 12 ounce bottles. The water in India is very bad and many persons never drink anything but aërated waters; but what causes the greatest consumption of soda water in India is the "Peg." This is a drink of whisky or brandy mixed with a bottle of soda water, and ninety-nine one hundredths of the liquor is drank in this way. Whisky is never drank "neat;" but although it is well watered, I doubt if there is a place in the world where the consumption of liquors will average that drank by the European population in India.

The term European applies to all foreigners in India who are of white skin. The aërated water trade is being much cut into by the regimental who are large consumers. They buy a machine, manufacture their own and sell them to customers at greatly reduced prices. A petition has gone up to the Viceroy from the tradespeople, protesting against the soldiers competing with them in this way. Natives do all the work, prepare the syrup, and bottle the waters.

A feature of the drug business is that no small quantities are sold as a general rule. Most things are put up in bottles and the customer must take a bottle or none. If he asks for an ounce of chlorate of potash lozenges, he is told they are only kept in bottles, one rupee each, a four ounce bottle containing about three ounces of lozenges for forty cents. Vaseline, lime water, ipecac wine, spirit of nitre, etc., are all kept in bottles, and it is very seldom any one inquires for half an ounce or one ounce, and sends a bottle for it. Many things that are sold several times daily in all shops at home, rarely find a sale here. Senna, salt, magnesia and paregoric are sold once a week probably,

The prescription trade is large and profitable, there being a fixed price which is adhered to by most Europeans. There are many native chemist shop, which advertise the compounding of prescriptions, but many who deal exclusively with them for other things, send their prescriptions to European chemists.

There are a great many native doctors who have a diploma from some Indian native university, who can speak and write English, and have considerable, practice. Then there are the apothecaries, who are employed by the government in every station to take charge of the station dispensary and practice among the government clerks, such service being given to them free, while the apothecary draws an income also from the tradespeople, many of whom employ him. The European doctors are all army surgeons who are appointed civil surgeons in the different European stations. Besides drawing his army pay he enjoys a large income from his practice. A civil surgeon serves three years in one station and is then transferred to another. From these different practitioners there comes a large prescription business and sale of surgical appliances, etc.

Few customers appear at the store and then only when it is necessary to select, or when buying fancy goods, etc. A greater part of the trade is done by chits (notes sent by servants), and nine-tenths of the business is credit. Such a country for credit does not exist in another place and there is not a firm that does not carry a large amount of bad debts on its books. People seldom carry money with them and credit is refused only to those who are known "bad hats."

Now, as to the preparation of prescriptions. In Bengal and the Punjab the eastern and northern portion of India, the European assistant copies the prescription in the book, and at the same time calls out the ingredients to a native, who is called a compounder. He has served a sort of an apprenticeship in some dispensary, then has some experience in a drug store and there develops into a compounder. He seldom speaks English, but, as a rule, can make out the names of the ingredients and quantities, but can seldom read directions. He places all his bottles on the counter and then prepares the prescription while the European gives him the quantities. Unless the prescription require some special manipulation, he manages to compound it all right; but otherwise it is necessary to stand by him and tell him what to do. They do everything, prepare plasters, suppositories, etc., make all the preparations for the shelves, but everything must be checked. After the prescription is compounded, he calls out the quantities and has his bottles in order as they appear in the prescription. Often he has gotten hold of the wrong bottle and the preparation is useless, and all it concerns is an ejaculation and it passes out of his mind the next minute. It would be impossible for Europeans to do the work, the heat is so great and working away at a batch of pills would cause a profuse perspiration in two minutes. There is a native for everything and on account of the caste institution of India one man will not do the work of another. There is one man whose special duty is washing bottles, etc., another acts as an apprentice to the compounder who shoves the hard work on him, such as working pill masses, pounding roots, etc., and so firm set are they in their feeling of respect for those above them they dare not rebel.

Bills are all collected by natives called chupprassees, and are sent out at the beginning of each month. There is a system of checking by which the bills can be traced daily to each chupprassee; and should any money be missing or not be turned in, and some customer declared he paid, the chupprassee to whom the bill was delivered on the day of payment can be traced at once. But there is little stealing this way and natives are trusted with large amounts in their possession.

But nine-tenths of them steal, though in small amounts, and while your man would not steal a hundred dollars from you he would not scruple to steal a two cent piece. It is necessary to keep all the show cases locked day and night, and when serving a customer, you are compelled to unlock a case before you can get at the goods. Quinine and expensive chemicals are also under lock and key. The natives in the government dispensaries stole so much quinine that, to protect itself, the government have all their quinine colored pink, which effectually prevents anyone from disposing of it. As for lying, they are professionals, from the compounder to the lowest menial, and they can hatch up lies in a twinkling. There is a man (Chowkedar), who sleeps on the verandah at night to receive any chits that may come and also to guard the place.

In the Bombay Presidency the European clerk has a still better time of it as Portugese compounders are mostly employed, and they write their own labels, copy the prescriptions and do not require checking. But what is most to be commended in the business in India are the hours. Here in Lahore we open at eight o'clock and close at six. One hour is allowed for breakfast, one for dinner or lunch, and a cup of tea is brought into the shop about four clock; close on Saturday afternoon at two, and never open at night or on Sunday. In Simla, in the Himalayas, where I served two years, in

winter we opened at nine and closed at five in the afternoon.

It is a poor place to apprentice a white boy. From his earliest days all his work is done by natives, and when he comes into a shop he think. he is being made a menial if called upon to do anything servants could do. So he gets no practical experience in the rudiments, learns the business in a superficial way and would not be fit, when three years in the business, to take the place of a six months' apprentice at home. But don't let any one who hears these line come to India on a speculation In the first place the climate is against you. Should you be on a Plains' station during the summer you must be under a Punkha—a large fan, which swings backward and forward above your head, creating a breeze all day and all night. One is over your head in the dispensary, another in the shop proper, one over your dining table, and one over your bed, and this last is the one which causes one to forget the commandments if anything in the world does. You go to sleep with the punkha coolie giving you a fine breeze. After an hour he falls asleep and you awake in a profuse perspiration and with a muttered ejaculation shy a boot at his head, which effectually wakens him up for another hour. And thus goes on the night and the poor punkha coolie in the morning is only too glad to get away and soothe his bruises.

It is difficult to get a situation. I came to India knowing nothing whatever of the country nor anybody in it. I found but three chemist shops in Calcutta employing Europeans, and this is the largest city in India. Then I received the awful information that every chemist brought his assistant (drug clerk) out from England on an agreement, passage paid out and back, and the clerk to stop with his employer three, four or five years as the case ay be. In three weeks I was fortunate enough to secure a vacancy, but I might have been six months without even hearing of one. For a clerk to leave at the end of his agreement long notice must be given, allowing his employer ample time to bring out another man from England. Lastly your salary varies, a very distressing fact. The rupee the coin used in India—silver—fluctuates. When I came to India it was worth one shilling and eight pence—40 cents; then it went down to 1.6, then to less than 1.4 (32 cents), and now it is at one and six pence; it should be two Shillings (50 cents) when at par, and I trust that when I leave the country it may be at a favorable rate of exchange to somewhat compensate me for the heat and fevers that I have endured since entering the country.

I trust these lines may have proved of interest to you, and that it way not be many days before I can be present at one of your social gatherings.

John A. Falck.

## CHEMICAL NOTES.

**Bryony root.**—Chas. F. Heller, Ph. G., made the following determinations with a specimen of the root containing 7.5 per cent. of moisture. It yielded 5.5 per cent. of ash, consisting of sulphate, chloride and carbonate of potassium, sodium, calcium, magnesium and aluminium. The benzol extract mounted to 0.746 per cent., and consisted of fixed oil, waxy substance and coloring matter. The alcoholic extract weighed 15.494 per cent., and from it the glucoside bryonin was prepared by the process of Walz. The aqueous extraction contained 9.360 per cent. of solid matter, consisting mainly of sugar, gum and albumen. On continued boiling with diluted sulphuric acid starch was the chief principle taken up, the extract weighing 49.024 per cent. Caustic soda now dissolved 6.1 per cent., and the residuary cellulose, after bleaching and drying, weighed 6.506 per cent.

**Myrrh.**—A sample of myrrh examined by Chas. E. Escott, Ph. G., treated with alcohol, left 56 per cent of insoluble matter. Maceration with petroleum benzin yielded a pale yellow liquid, which on spontaneous evaporation left 18.75 per cent. of oily residue. Caustic potassa gave with myrrh a solution of a brilliant red color, turning to amber color on dilution. The gum left on treatment with alcohol had a barely perceptible odor of myrrh and a slightly mucilaginous taste, was neutral to test paper, and though of a pale color, gave with water a dark brown solution, the odor changing and becoming stronger, without apparent decomposition. The insoluble portion amounted to 15 per cent., or 8.4 per cent. of the weight of the myrrh. The dilute solution (1:450) acquired a purple color by ferric chloride, changed to reddish yellow by ammonia. Stronger solutions were precipitated by alcohol, not gelatinized by borax, and the precipitate with subacetate of lead was not redissolved. A castor-oil emulsion made with the gum, proved to be not permanent. The gum makes a good mucilage and should be saved for that purpose in making tincture of myrrh.

**Damiana.**—The leaves of *Turnera aphrodisiaca*, Ward, have been examined by F. W. Pantzer, Ph. G., The air-dry leaves lost in a drying chamber 11 per cent of moisture and volatile oil, yielded 9.68 per cent. of ash. Petroleum benzin extracted 7 per cent. of volatile oil, fat, wax and resinous matter. Alcohol of 80 per cent. yielded 20 per cent. of dark green extract, containing tannin, two tasteless resins and extractive. Water dissolved 16 per cent. of mucilaginous and extractive principles, and by distillation with water  $\frac{1}{2}$  per cent. of an amber colored volatile oil was obtained, having a heavy aromatic odor and a warm camphoraceous and bitter taste. Alkaloids and glucosides were not observed.

## GLEANINGS IN MATERIA MEDICA.

**Wistaria chinensis**, Lin. A poisonous glucoside has been isolated from the bark of this ornamental climber by Ottow (Nieuw Tijdschr., 1886, p. 207), and has been named wistarin. It is freely soluble in alcoholic liquids, sparingly soluble in ether, chloroform and cold water, is colored violet and green-brown by ferric chloride, and dissolves in alkalies and alkali carbonates with a yellow color, and in sulphuric acid with a yellow color changing to cherry red. Wistarin has a bitter and astringent taste, melts at 204° C., is not precipitated by tannin, yields a white precipitate with basic



lead acetate and a green one with copper sulphate, and on being boiled with dilute sulphuric acid is decomposed into sugar, a crystalline resin, and a volatile oil having the odor of menyanthol; this oil when treated with warm potassa solution is converted into a white compound of a coumarin-like odor.

The bark contains also a resin having apparently toxic properties.

***Spiræa Filipendula***, Lin., is a perennial herb the tuberous roots of which were formerly used in excessive secretion of mucous glands, and over fifty years ago were recommended in hydrophobia. Recently a Polish physician, Dr. F. I. Jagell, stated that he had successfully used the bark of this plant in the form of infusion, in 88 cases where persons had been bitten by rabid dogs or wolves, 26 of the patients having already exhibited the early symptoms of hydrophobia.

The root has not been fully analyzed, but is known to contain tannin, sugar and starch, and in the fresh state also a volatile oil, which is probably identical with that of the stem and leaves, this consisting of salicylic aldehyde.

***Boldoglucin***. Dr. René Juranville has given in his graduation thesis the experiments and results with this glucoside, the preparation and properties of which were described in the AMER. JOUR. PHAR., 1884, p. 580. On account of its strong odor, boldoglucin cannot readily be given in the form of mixtures; but it was best administered to insane patients enclosed in gelatin capsules or by means of clysters. In doses of 1.5 to 4.0 gm. it produced a decided hypnotic effect, and occasionally cessation of the hallucinations; but these as well as sleeplessness returned on discontinuing the use of the remedy. Though it cannot supplant other reliable hypnotics, it appears to be useful in certain forms of insomnia.

***Action of caffeine and theine***. Léven in 1868, showed that theine produced convulsions in frogs, while caffeine did not; and that the lethal dose of theine was larger than that of caffeine. This is confirmed by the experiments on frogs, made by Dr. Thos. J. Mays, from which the following conclusions are drawn:

Theine and caffeine agree in the following—

1. They first affect the anterior extremities.
2. They diminish respiration.
3. They produce hyperæsthesia during the latter stage of the poisoning process.

They differ in the following —

1. Theine principally influences sensation, while caffeine does not.
2. Theine produces spontaneous spasms and convulsions, while caffeine does not.
3. Theine impairs the nasal reflex early in the poisoning process, while caffeine does not, if at all, until in the very last stage.

4. The lethal dose of theine is larger than that of caffeine —  
*Therap. Gazette*, September '86

***Orthosiphon stamineus***, Bentham, s. *Ocymum grandiflorum*, Blume, is, indigenous to India, Java and the Nicobar and Philippine Islands. The pale green leaves have purplish petioles and veins, and on both sides of the blade prominent oil glands. Dr. Van Itallie (*Phar. Zeitung*, 1886, p. 376) obtained from the dried leaves a small quantity of volatile oil and of a crystalline glucoside. This *orthosiphonin* has a bitter and afterward sweet taste, is freely soluble in absolute alcohol, less soluble in weak alcohol and in chloroform, almost insoluble in absolute ether, and is precipitated by plumbic subacetate, but not by the acetate or by tannin. It does not contain nitrogen.

### VARIETIES.

AGARICUS ALBUS has been successfully used by Dr. A. Peter (*Med. News*) for relieving the sweating of consumptives. Ten grains given at bed time had a cathartic effect; but given in five grain doses no such effect was observed, and in about a week all sweating ceased. When a return of the night sweats is threatened relief is again afforded by the remedy, which has no effect upon the cough.

AGARIC ACID in doses of 1/12 to 1/8 grain has been similarly employed.

QUININE RASH.—Dr. M. A. Veeder, of Lyons, N. Y., observed a case of quinine rash in which the condition of the skin closely resembled that existing in scarlatina. The patient had been taking quinine in small doses for some slight disorder, supposed to be malarial; but, becoming alarmed, medical advice was so sought, and the taking of quinine was forbidden. The rash disappeared promptly, but returned again when, as an experiment, quinine was administered in small doses.—N. Y. Med. Record.

CHARCOAL and CAMPHOR—A mixture of equal parts of camphor and animal charcoal is recommended by Barbocci for preventing the offensive odor and removing the pain of old excavated ulcers. The camphor is stated, to act as a disinfectant, and the charcoal absorbs the offensive odors.—*British Med. Jour.*

### REVIEWS AND BIBLIOGRAPHICAL NOTICES

American Medical Plants an illustrated and descriptive guide to American plants. By C. F. Millspaugh, M. D. New York and Philadelphia Boericke & Tafel, Fascicle V (Nos. 21 to 25). Price \$5.

The indigenous North American plants described in this fascicle are *Aesculus glabra*, *Ambrosia artemisiæfolia*, *Argemone mexicana*, *Arisæma Dracontium*, *Collinsonia canadensis*, *Chamælririum luteum*, *Euphorbia hypericifolia*, *Helianthemum canadense*, *Humulus Lupulus*, *Hydrophyllum virginicum*, *Lachnanthes tinctoria*, *Lactuca canadensis*, *Leptandra virginica*, *Lilium superbum*, *Lycopus virginicus*, *Penthorum sedoides*, *Ptelea trifoliata*, *Polygonum acre* and *Ranunculus sceleratus*. The following plants are naturalized, adventive or cultivated: *Anagallis arvensis*,

Artemisia Absinthium, Artemisia vulgaris Chenopodium anthelminticum, Convolvulus arvensis, Euphorbia Lathyris, Hypericum perforatum, Phaseolus vulgaris, Salix purpurea, Sinapis alba and Solanum nigrum. The plates are well executed, and the characters of the plants are usually fully indicated; of Chenopodium and perhaps of one or two other plants, a more characteristic figure would have been acceptable.

Of the more important inaccuracies in the text the following deserve to be mentioned: Oleum hyperici is not a constituent of St. John's wort, but an oleoinfusion colored red by the coloring matter probably contained in the black dots The root of Artemisia vulgaris has been repeatedly analyzed since 1826 but a new analysis is desirable. Thridace is not lactucarium, but is an extract obtained by expressing cultivated lettuce. Although we have shown, twenty years ago, that an efficient lactucarium may be prepared from Lactuca canadensis and W. Hiland Flowers in 1879 proved this to have the same constituents as European lactucarium, we are not aware that the American plant is utilized for preparing lactucarium.