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Botanical Medicine Monographs and Sundry

SYRUPUS LACTUCARII.

By GEO. M. BERINGER, Ph.G.

Read at the Pharmaceutical Meeting, January 17.

The formula for syrup of lactucarium of the Pharmacopoeia of 1870 yielded a preparation which, to say the least, was not desirable; being unsightly, turbid and not answering the requirements of modern elegant pharmacy. The *modus operandi*, briefly stated, consisted in treating one troy-ounce of lactucarium properly comminuted with diluted alcohol until a half pint of tincture was obtained. This tincture, evaporated at a temperature not exceeding 160°F. to 2 fluidounces, was mixed with 14 fluid-ounces of warm syrup.

That the turbidity and unsightliness of this preparation was due to, the lactucerin or lactucone—the caoutchouc-like matter—was early recognized. In 1868, Mr. James Kenworthy recommended that the tincture be triturated with powdered pumice-stone and water, and filtered, and then decolorized. by treating with animal charcoal before adding the sugar.

The same year, Mr. R. F. Fairthorne recommended that the tincture prepared as in the process of the Pharmacopoeia of 1870, be treated with ether to dissolve out the lactucerin, the ethereal solution separated and the tincture then mixed with sugar and water.

In 1878, Mr. Lemberger proposed treating the lactucarium with benzin previous to its extraction with diluted alcohol, and submitted the following formula for the fluid extract to the Committee on Revision of the Pharmacopoeia:¹

Take of

Lactucarium	16 parts.
Benzin	32 parts
Diluted alcohol,	a sufficient quantity

Beat the lactucarium thoroughly in an iron mortar, then introduce it into a wide-mouth bottle of the capacity of about 48 parts of water, add the benzin, cork tightly, and macerate, with frequent agitation, for twenty-four hours. Then let it stand for about twenty-four hours, or until the lactucarium subsides and the benzin solution becomes clear or nearly so. Decant the benzin solution, transfer the lactucarium to a stone or glass slab, spread it as thin as possible, and allow it to remain there until it is completely dry (at least twenty-four hours). Then rub it in an iron mortar with an equal weight of clean sand, introduce it into a conical percolator, first prepared with a

¹ Proceedings American Pharmaceutical Association, 1878.

disk of flannel and a thin layer of sand, pack tightly and add diluted alcohol to a depth of several inches. When the liquid begins to drop, close the orifice of the percolator with a cork and allow it to stand at rest, well covered, for twenty-four hours. Now remove the cork and collect 4 parts of percolate, which set aside. Continue the percolation until the lactucarium is exhausted, recover the alcohol from the percolate by distillation from a water-bath, and evaporate the residue on a waterbath to 10 parts. Mix this with the reserved portion, filter and wash the filter with enough diluted alcohol to make the whole product weigh 16 parts.

In this process the lactucerin is not entirely removed. That portion of the benzin remaining in the lactucarium after decanting, which is considerable, remains saturated with lactucerin, sufficient to leave the lactucarium, on drying, of a gummy tendency and difficult to pulverize and sufficient to be extracted by the subsequent treatment with diluted alcohol, and to render the syrup made therefrom decidedly turbid.

If, however, the lactucarium after decanting the clear layer of benzin is thrown on a double paper filter and then washed with about half the quantity of benzin first used, this dissolved portion will be forced out and the lactucarium remaining will dry and be easily pulverized and extracted.

The Pharmacopoeia of 1880 instituted a new departure, adopting a formula for a fluid extract. The aim of this formula, as of all recent formulae and investigations, was to furnish a preparation from which a perfectly clear and acceptable syrup could be made by simple admixture. The officinal formula devised by Prof. C. L. Diehl is remarkable for its complexity. No attempt is made to remove the lactucerin; the treatment with ether merely aiming to disintegrate and separate it from the other ingredients, and leave it in such a condition that comparatively little will be dissolved by the subsequent macerations with weak alcohol, and this is largely deposited on evaporating the strained solutions and allowing to stand for a time.

While the product of the present officinal formula is a decided improvement on that of the previous Pharmacopoeia, it is not entirely satisfactory, the method being expensive and difficult. As the use is rather limited, but few retail druggists will attempt to prepare it, depending on the manufacturing pharmacist for their supply of the fluid extract. As the officinal formula is not satisfactory in manipulation or in product, it is not generally followed by these manufacturers. It becomes the duty of the revisers of our national standard to adopt such a formula as will be practical for the retailer or the manufacturer. I am of the opinion that a radical mistake of all the proposed formulae for fluid extract of lactucarium is the attempt to make a fluid extract of the strength of 100 gm. to the 100 c.c. In fact, all fluid extracts would be rendered more permanent and uniform in medicinal effects if a strength of one-half troy-ounce to the fluidounce, or of 50 gms. to the 100 c.c. had been adopted. This is especially the case with a drug like lactucarium, yielding to diluted alcohol nearly fifty per cent. of its weight. In confirmation of this point, I would say that several of the principal manufacturers are making this fluid extract of only one-half the officinal strength.

I have been preparing syrup of lactucarium from a fluid extract, or, I should rather

say, a concentrated tincture of lactucarium of onehalf the officinal strength. The formula which is based on that of Mr. Lemberger is as follows:

Take of
Lactucarium 100 gms.

Beat it up in an iron mortar with an equal weight of clean sand (I prefer small pieces of pumice-stone) to a coarse powder and place it in a large bottle with

Benzin 400 c.c.

Tightly cork the bottle and allow to macerate for 2 or 3 days with repeated agitation. Decant the lactucarium in a double paper-filter and allow it to drain. Wash the dregs with about 100 or 150 c.c. of benzin and allow the lactucarium to dry by opening out the filter on a slab or a few sheets of porous paper. When dry rub it up in an iron mortar, using a little more sand or pumice, if necessary, and pack lightly in a conical percolator. Cover with a layer of several inches with a menstruum of

Glycerin 25 c.c.
Water 75 c.c.
Alcohol 100 c.c.

Tightly cork the lower orifice of the percolator and allow to macerate for 24 hours. Then continue the percolation reserving the first 125 c.c. of percolate. Continue the percolation, using diluted alcohol, until the lactucarium is extracted. Evaporate this tincture in the water-bath at a moderate temperature (about 160° F.) to 75 c.c. and mix with the reserved portion. Filter and add enough diluted alcohol through the filter to make the finished product measure 200 c.c.

To prepare the syrup,

Take of
Concentrated tincture of lactucarium 10 gms.
Syrup 90 gms.

Mix.

The samples of syrup and of the concentrated tincture submitted were prepared in May 1887, since which time they have remained in the same vials and have not been filtered. I submit another sample of syrup made at the same time, as follows:

Concentrated tincture of lactucarium 10 gms.
Glycerin 10 gms.
Syrup 80 gms.

Mix.

FLUID EXTRACT OF CAULOPHYLLUM.

Contribution from the Pharmaceutical Laboratory, Philadelphia College of Pharmacy.

By J. H. BUNTING.

Read at the Pharmaceutical Meeting, January 17.

Different menstrua were used on four portions of caulophyllum, each of $8\frac{1}{3}$ ounces avoirdupois, in No. 60 powder, and the resulting products were numbered one, two, three and four respectively.

Dilute alcohol was used in No. 1. After moistening the drug it was firmly packed in a cylindrical percolator and sufficient menstruum was added to saturate the powder and leave a stratum above. When the liquid began to drop, the lower orifice was closed, the percolator covered and the contents macerated for 48 hours. At the expiration of this time, the percolation was allowed to proceed until the drug was exhausted. The first $6\frac{2}{3}$ fluidounces of the percolate were reserved, and the remainder evaporated to a soft extract and dissolved in the reserve portion, adding sufficient diluted alcohol to make the finished product measure 8 fluidounces. This menstruum was not a good one. The extract was not clear and a heavy deposit took place.

In No. 2 a menstruum of 2 parts alcohol and 1 part of water was used. The manipulations with this and the subsequent ones were as in the preceding one. A better product was obtained by the use of alcohol and water in this proportion. It was not, however, a satisfactory product, as there was a considerable deposit on allowing it to stand.

No. 3, in which 3 parts alcohol and 1 part water were used as a menstruum, proved to be the best of the lot. A very good fluid extract was obtained which remains clear with only a slight deposit after allowing it to stand undisturbed more than two months.

In No. 4 the same menstruum, i. e., diluted alcohol, as in No. 1, was used, except that 10 per cent. of glycerin was added to the first 8 fluidounces of menstruum used. A very unsatisfactory product resulted from the use of the glycerin; the deposit being greater than in No. 1.

FLUID EXTRACT OF YERBA SANTA (ERIODICTYON GLUTINOSUM).

Contribution from the Pharmaceutical Laboratory, Philadelphia College of Pharmacy.

By F. B. QUACKENBUSH.

Read at the Pharmaceutical Meeting, January 17.

A formula for the above extract having been desired, the following experiments were undertaken with the view of determining the best menstruum to secure permanency in the fluid extract, and thorough exhaustion of the drug. The herb of Eriodictyon glutinosum, or as it is sometimes called, Eriodictyon californicum, was used in these experiments. It is non-official, and no formula is given in the dispensatories, for its

preparation, and as one of the objects was to find the best menstruum for the drug it was concluded, after considering its character, to use in one case a menstruum of 3 parts alcohol and 1 part water, and in the other case one consisting of 2 parts alcohol and 1 of water.

The first formula is as follows:

Yerba santa in No. 60 powder	225 gin.
Alcohol	168 gm.
Water	57 gm.

To make 225 c.c. of the finished product.

The drug after being thoroughly moistened with 1¹/₂ fluidounces of the menstruum, was firmly packed in a cylindrical percolator, fitted at the neck with a cork of such size that when placed tightly in position it was about half way down the neck of the percolator. A glass tube was passed through the centre of the cork so that the upper end of the glass was flush with the upper surface of the cork, and of sufficient length to protrude a short distance below the neck of the percolator. A short piece of rubber tubing was placed upon the lower end, leaving about two inches of the tubing below the glass, on which was placed a pinchcock to regulate the flow. A small piece of cotton, previously moistened with the menstruum, was placed in the neck of the percolator, and pressed firmly down upon the surface of the cork. After packing the powder in the percolator a small disc of filtering paper was placed upon the drug, and the menstruum gradually added, always keeping a stratum above the surface of the drug, until the liquid began to drop from the percolator. The pinchcock was then closed, the top of the percolator tightly covered with a piece of waxed paper and maceration was continued for forty-eight hours. The liquid was subsequently allowed to drop slowly from the percolator, and the balance of the menstruum gradually added. The first 200 c.c. was set aside as the reserve portion, and the balance collected in another bottle; 225 c.c. of the menstruum were not sufficient to exhaust the drug, hence 140 c.c. more menstruum were added. The menstruum which had been absorbed by the drug was forced through by pouring 20 fluidounces of water into the percolator. The weak percolate was distilled to recover the alcohol, and the residue evaporated to a soft extract by means of a water-bath. The extract was dissolved in the reserve portion, and sufficient menstruum was added to make the required 225 c.c. of the finished product.

In the second formula a menstruum of 2 parts alcohol and 1 of water was used as follows:

Yerba santa in No. 60 powder	225 gm.
Alcohol	150
Water	75

To make 225 cc. of the finished product.

The details of the manufacture of this extract are identical with those of the first formula, except that 150 cc. more menstruum were added to exhaust the drug instead of 140 c.c., as in the former case.

A comparison of the two processes would seem to indicate a preference for the first formula.

The residue of the first formula was found to be odorless, tasteless, and almost colorless, whilst that of the second formula still retained a slight odor and taste of the drug, which would indicate that it was not entirely exhausted, hence the extract could not contain as much of the active principle of the drug as that made by the first formula, both processes being conducted with the same care and attention.

The fluid extract made by the first formula had a peculiar odor, a dark olive-green color, and possessed an astringent and strongly bitter taste, whilst that obtained by the second formula had about the same odor, but it was much lighter in color, and lacked a deal of the astringency and bitterness which was found in the former.

The investigations seem to show clearly that a menstruum of 2 parts alcohol and 1 part water is much better for completely exhausting the active principles of the drug.

The alcohol which was recovered in the process of distillation had a strong odor of the drug, and, in order to purify it, 5 grs. of permanganate of potassium were added, and the whole allowed to stand for forty-eight hours, after which it was re-distilled. This distillate was converted into diluted alcohol by adding the required quantity of water. By this process a product was obtained which had but a faint odor of the drug, and the liquid could be used for many purposes.

THE BITTER PRINCIPLE OF BURDOCK FRUIT.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.

By HENRY TRIMBLE.

In the AMERICAN JOURNAL OF PHARMACY for 1885, page 127, is an account of the proximate analysis of burdock fruit, by Mr. J. D. MacFarland and myself, in which it was stated that the bitter principle, then believed to be an alkaloid, would be further investigated. Since then as time has permitted I have reviewed the work until an entire re-analysis has been completed. The results differ in no important particular from those recorded then, except in the character of the bitter principle.

The absolute alcohol extract has been found now as then, to consist of a little resinous substance, somewhat soluble in water, and completely soluble in dilute alcohol. A large quantity of the desired material was prepared by exhausting the drug with petroleum spirit to remove fixed oil, and then with alcohol. On pouring the concentrated alcoholic solution into water the resin separated, but the bitter principle dissolved in the water, from which it was readily removed by agitation with chloroform. The residue on evaporating the chloroform was treated with water, and the clear aqueous solution allowed to evaporate in a desiccator over sulphuric acid, when a white granular crystalline substance separated. This may be further purified by resolution in water and again evaporating in a desiccator. The purified material is pure white, of an intensely bitter taste, and has a neutral reaction. On testing for

alkaloids, negative results are gotten. Fehling's solution is not reduced, but on first boiling with very dilute hydrochloric acid for fifteen minutes the solution becomes cloudy, and finally a resin separates which appears to be identical with the resin obtained on pouring the alcoholic solution into water; now when the clear filtrate from this resin is tested with Fehling's solution for glucose, decided evidence of it is obtained.

It is evident that the bitter principle is a glucoside, which, on boiling with dilute acid, decomposes into the resin, which is soluble in alcohol and sugar. Having more definitely determined the character of the bitter principle and exhibited a distinct quantity of it in crystalline form, I hope soon to investigate its composition and properties more fully.

AN EXAMINATION OF CASCARA SAGRADA.

By H. F. MEIER AND J. LEROY WEBBER.

In addition to what has been already ascertained in regard to the chemical composition of the bark of *Rhamnus purshiana*, we desire to contribute the following: A summary of existing knowledge as to its constitution may be found in THE AMERICAN JOURNAL OF PHARMACY for 1879, p. 165, by Prof Prescott. Passing over the microscopical examination, it appears that there have been recognized among its constituents three resins—a brown, red and yellow resin, respectively; 4, a crystallizable body; 5, tannic acid; 6, oxalic acid; 7, malic acid; 8, a fat oil; 9, a volatile oil; 10, wax; 11, starch.

In addition to what has been above enumerated, we may refer to a note in the *Pharmaceutical Journal and Transactions*, 1885, p. 615, wherein Mr. Limousin expressed the opinion that the resinous bodies, separated by Prof Prescott, were all more or less derived from chrysophanic acid, which he has observed to be present in it in notable quantities.

In the same journal, 1886, p. 918, there is a reference to a substance, received by Prof. Wenzell, with an examination thesis. It is described as of a deep orange-red color, a glucoside, differing entirely from frangulin and emodin. This description is somewhat fuller than the one given in the AMERICAN JOURNAL OF PHARMACY for 1886, p. 252. In the latter journal it is stated that the principle will be further examined by Prof. Wenzell.

We have found after an exhaustive examination, and abundantly verified the presence of, three other bodies whose influence, both in a pharmaceutical and physiological sense, is of decided importance. We would name here, 1st, a ferment; 2d, glucose; 3d, traces of ammonia. The ferment alluded to, seems to be identical with that existing in numerous other vegetable substances. While the isolation and ultimate analysis of this element must of necessity be deferred for some time, owing to the difficulty of obtaining it in a state of purity, yet we may say, unhesitatingly, that its effects are identical with those of the principle existing in cabbage, licorice root, in frangula and, undoubtedly, in many other vegetables. Its presence in frangula

does not seem to have been suspected hitherto, nor has its range of possibly mischievous action been fully appreciated. That this ferment, as it exists in cascara, is capable of producing griping or epigastric pain, we have absolutely demonstrated. The necessary steps have also been taken to obtain a supply of fresh frangula bark, in order to decide the question absolutely, as we are convinced that it is this ferment in the fresh bark which causes the undesirable results. The process appears to us very simple. If the undestroyed ferment be administered along with the laxative ingredients, as would be the case in a cold infusion, the identical results follow as in the bark itself, that is, a generation of free acid, which in the ease of the stomach would undoubtedly be lactic acid, and prove an unwelcome visitor when produced in abnormal quantities. In substantiation of this view, we beg to quote Bartholow (*Materia Medica and Therapeutics*, p. 69): "In large doses (1 drachm) it (lactic acid) gives rise to epigastric pain, flatulence and loss of appetite." How important a recognition of this fact is to the scientific physician will be readily appreciated, inasmuch as a great deal of unnecessary pain and suffering may be prevented. Its importance in a pharmaceutical sense will be recognized by those interested when we state that we have demonstrated that the ferment in question is operative, as far as we are concerned, from the moment that the bark is removed from the tree. It will follow, therefore, that a continuous decomposition and change is going on in this bark, as well as in frangula. The means of removing the difficulty, and of obtaining a permanent bark which retains all of the medicinal activity in the highest degree will be at once apparent, thereby enabling us to secure from decomposition the principle next to be considered, and render the bark absolutely permanent. A few references may not be amiss, in order to indicate how near at hand a recognition of this substance should have been. Quoting from the AMERICAN JOURNAL OF PHARMACY, 1871, p. 457, H. C. Baildon, of Edinburgh, states that "I have repeatedly taken the decoction myself without griping," and from the tenor of his communication we should conclude that he had been using recent bark. In the same journal, 1876, p. 319, there is an account of a very anomalous behaviour of the fresh bark, and the statement is also made by Fristedt that the recent bark produces colic and vomiting. We have already indicated the cause of the difficulty, and believe that we shall shortly be able to explain why the fresh bark is inefficient, as here noted, in addition to producing the disagreeable effects.

The existence of this ferment may be easily demonstrated to the satisfaction of even the most skeptical investigator in a very simple manner. A cold aqueous percolate from four ounces of the bark of *Rhamnus purshiana*, to the pint, is divided into two equal portions, and both exactly neutralized with sodium bicarbonate. One portion is now to be boiled or exposed in a flask to the heat of boiling water for at least a half-hour. That a temperature must be used, capable of destroying this ferment, is evident, when the object in view is considered. The addition of a little yeast, to both the infusion and cooled decoction, will illustrate the matter admirably. In the decoction the vinous fermentation alone progresses, while in the infusion a gradual departure from neutrality will be observed, and with increasing acidity a precipitation of the resins, previously held in solution as sodium compounds.

The glucoside referred to seems to be peculiar to *Rhamnus purshiana*, as we have been unable to determine its presence in the frangula bark, as it occurs in commerce. This glucoside, though having very important functions and properties, has hitherto

escaped a deserved recognition. A further examination of the fresh bark will, we think, confirm the existence of a remarkable difference between these two barks, inasmuch as experience has demonstrated that *Rhamnus purshiana* exerts a decided and unmistakable tonic effect, we are inclined to ascribe these properties to the bitter, crystallizable principle already spoken of. Physiological tests to determine the actual properties, not only of the bitter substance, but of the comparative laxative power of the different resins, are under way. The glucoside may be obtained in a comparatively pure state for examination by precipitating an aqueous infusion or percolate from cascara with sub-acetate of lead. After removal of the excess of lead by H_2S , the solution exhibits a remarkable decomposition, when boiled with sulphuric, hydrochloric, or lactic acid. The solution becomes intensely bitter, turbid on cooling, and a microscopical examination indicates the presence of a substance, insoluble in water, of an oily or resinous behaviour, and also crystals of the bitter substance referred to. This oily, or resinous body, seems to be an excellent solvent for the bitter principle, inasmuch as on cooling, fine crystals may be seen distributed through it. It is evident from the behaviour of this solution that the ferment has been separated, and it is, therefore, precipitable by sub-acetate of lead.

We do not wish to be understood as supposing or claiming that this ferment acts directly in producing a decomposition of the glucoside, because such is not the case. The ferment simply is instrumental in generating vegetable acids, and these latter are the direct agents engaged in the decomposition. A great step in advance will have been made also, by the recognition of the fact that these changes can take place in the cold, at ordinary temperatures, in the human stomach, in the percolator, and even in the air-dried bark itself, the latter to all appearances being in a decidedly quiescent condition. We must not forget that all the conditions are present, even to the extent of the necessary moisture.

An ultimate analysis of the glucoside as well as the bitter principle will follow shortly.

The glucose, which is present in varying proportions, according to the age of the bark, plays a very important part in the pharmacy of cascara. As a medicinal agent it is certainly inert in common with vegetable albumen, the starches, etc., and is even capable of producing much mischief by undergoing the process of fermentation under favorable conditions. That the glucose is the active element in producing the very undesirable "falling," as referred to by Mr. Butterfield, in the *Pharmaceutical Journal and Transactions*, 1887, p. 473, is very evident; that an extract containing a liberal quantity of glucose may, in the process of manufacture into a pill, gather on its surface a small army of ferment germs with the natural result, will not be denied. The glucose decomposes into alcohol and carbonic acid, and it is not a matter of wonder that the pills get soft. It may be possible to destroy these germs by the application of an alcoholic varnish, but we would respectfully submit our opinion that it would be a much more scientific method to remove the inert glucose and avoid the presentation of bullets.

The traces of ammonia which we have been able to find remaining in the bark, indicate to us that this ingredient has undoubtedly a distinct function, which appears to us as that of rendering the resins soluble and transportable for the purposes of the plant. In this respect we think it very analogous to licorice root, inasmuch as careful

observers have already noted the absence from old licorice root of the sufficient amount of ammonia, to render the glycyrrhizin, or sweet principle entirely soluble in water, and have even advised replacing it by exposing the root to the vapors of ammonia in a suitable closed vessel. We beg to refer in this connection to the statements of Dr. Hager, in his "Handbuch der Pharmaceutischen Praxis," p. 664, Supplement, quoting Prof. Landerer on this subject. While ammonia may be the active agent, or base in the plant itself, and which we propose to determine by an examination of the fresh bark, we are convinced that for pharmaceutical purposes other alkaline bases are preferable. It is difficult to concentrate by evaporation a neutral, ammoniacal extract from either licorice or cascara without loss of a decided quantity of the volatile alkali, inasmuch as the organic acids seem to have but a feeble affinity for it, insufficient to resist the dissociating action of the temperature employed in evaporation. Like results would undoubtedly follow an attempted concentration of some other salts of ammonia with organic acids, as for instance, the endeavor to reduce volatile liniment to a solid form.

A full report will follow of the result of experiments directed at the solution of a number of questions of importance; among these questions is one addressed to the immediate source of the acid produced by the action of the ferment, whether it be glucose, albumen, or amyloids, alone or together. Another matter we have undertaken to determine is the part played by the ferment, its mode of action, and the reason for its final exhaustion. This involves a determination of what becomes of it while engaged in its occupation.

We believe also to have a right to expect that some light will be thrown on the formation of the resins themselves in the plant, and that an important natural process may thus be understood. The very existence of glucose itself in the bark is to us an evidence of a preceding glucosic fermentation. That this is continually going on in the apparently inactive bark, we have already shown. The mode of action of the bark of cascara, and which we have carefully studied, leads us to assume that the laxative properties are inherent in the resins, while the tonic effects are undoubtedly due to the crystalline bitter principle. That the bark is both laxative and tonic, and decidedly so, does not admit of further question, in spite of frequent denials.

It is very evident that an analysis of any plant which attempts to give the exact proportions of all its constituents, such as the percentage of its various ingredients, cannot be accepted as authoritative or as indicating the composition of any other specimen of such plant, except the one directly under consideration. It appears to us more important to establish the average quantity of medicinally active ingredients from the best representative specimens of vegetable drugs obtainable, because such a knowledge admits of a practical application to the establishment of a standard and for purposes of assay, so that uniform pharmaceutical products may be obtained. From what we have already demonstrated, it will be seen that an assay of the bark, obtained in a fresh condition, cannot tally exactly in its results with one arrived at from a sample of aged bark, in which decomposition processes have been going on since its removal from the plant.

DETROIT, Laboratory of Parke Davis & Co.

FLUID EXTRACT OF CASCARA SAGRADA.

EDITOR AMERICAN JOURNAL OF PHARMACY:

SIR:—After having tried all published formulas for the extract of cascara sagrada that came under my observation, and finding them deficient in preservative properties, that is, the extracts all precipitated heavily after a few weeks, I endeavored to find a more suitable menstruum for the drug, and believe I have succeeded. With this note you will find a specimen of the fluid extract remaining clear after six months' standing, and prepared by the following process:

Drug in No. 60 powder	1 lb.
Alcohol	1 1/2 pts.
Water	1/2 pt.

Moisten and pack in percolator; macerate for forty-eight hours, collect the first 13 fluid-ounces, evaporate the remainder to 3 ounces, and mix with the reserved portion.

Among the many readers of the Journal some may have had the same trouble with cascara, which may be avoided by using the above menstruum.

GERMANTOWN, Philadelphia, Jan. 23, 1888. Yours, etc.,

Wm. BICHY.

THE DRUG BUSINESS IN AUSTRALIA, INDIA AND THE UNITED STATES.²

Read before the Alumni Association, Philadelphia College of Pharmacy.

In a comparison of the pharmacy of America (U. S.), Australia and India, we have three countries widely separated and each dependent on its situation and customs in the development of its drug trade, and uninfluenced by any other country, with the exception probably of Australia, which naturally patterns after England, her people being thoroughly English as far as the profession of chemistry is concerned, though outside of this, they more nearly resemble Americans in their business enterprise. America by her early independence and hostility to England, her admixture of pharmacists from all countries, is distinctly responsible for the progress made in the profession in this country, the best evidence of which is in the revised edition of the British Pharmacopoeia which inclines to that of the United States in formulas as well as classification. India necessarily uses the British Pharmacopoeia, her druggists being of that nationality as well as ninety-nine onehundredths of her white population. But the condition under which business is done in India, the customs of the country and the climate, necessitate a different state of affairs in many cases.

The most important item is, of course, proficiency, and which of the three countries can claim the palm? The United States has Colleges of Pharmacy in several cities, and her Examining Boards in some States to regulate the trade and restrict it to

2 See also AMERICAN JOURNAL OF PHARMACY, 1887, p. 103. (AJP_1887_No_2.pdf)

competent persons; and Australia is likewise provided, while many of her druggists serve their time and obtain their certificate in England. In India a majority of the druggists are members of the British Pharmaceutical Society, and it is not to be gainsaid that the examination is very rigid, and many rejections are made both in the minor and major years. But India has no pharmaceutical laws and allows anyone to engage in the drug business; hence there are many incompetent persons so engaged, who depend wholly on their clerks in the conduct of their business. We have such here, but the number is small, fortunately, and legislation will shortly prevent it entirely.

The apprentice in the United States, serves on an average three years, while the Australian is required to pay a premium and serve five years. There is no apprenticeship in India worth speaking of, owing to the conditions which govern society. Does a five years apprenticeship turn out a better man than that of three years? I think not, except in one case, and that is the slowplodding fellow who is slow to learn, means to learn, and once he has mastered a subject retains it. But the average apprentice is as competent at the end of three years to do the practical work of a drug store as the five-year lad, and at the end of his fourth year is infinitely superior to the latter, owing to the greater scope of work he attends to, while the apprentice still lingers at defined limits. The Australian certainly has no advantage in his longer apprenticeship. After the apprenticeship or during its latter years, the theoretical branch of pharmacy impresses itself on the student and owing to our superior advantages in collegiate education and more stringent registry laws, the home druggist excels his Australian cousin on the average. There has been but one pharmaceutical school in Australia for many years and the attendance but slight, while the qualification examination has been merely nominal, except in Victoria where they were more strict. The Colonial Boards have now united and a General Board for Australia has been organized, looking to a more rigid regulation of pharmacy. But practice is what counts in pharmacy, and undoubtedly we are a nation of practical people. In our drug stores the clerk who is neat in his work, alert in his attention to customers, suave in his dealings, with them, and quick and accurate in his work, is the most appreciated. The nature of our trade forces these ideas on him, and he is very dull who does not see that these attributes are the essence of three-fourths of his future success in his profession. On the other hand the Australian is more slow-going, given to "taking his time," and has not that freedom of conversation with customers incident to Americans. The English idea of "master and man" is very prevalent in Australia, few of the employers vouchsafing a friendly or social word to their clerks, but maintaining an air of "upper crust," which seems to suppress one somewhat. He lacks the tact and address of his cousin, and does not learn that expertness and celerity in manipulation incident to the American, as his employer insists on his customer giving time, which is generally double that really necessary. In India the average druggist is good, but the Australian is better, and from my experience and connection with employers and clerks, the American is the best "all 'round" druggist of the three; and an American clerk who has faith in his own qualifications, can take a position in any of the two countries and feel that although "a stranger in a strange land," he is there "to stay."

There is but little room for comparison in the appearance and arrangement of the stores, for we are far ahead in making our places of business attractive. Australia and India stick to the old gold paper label, but few stores have improved on their shelf

bottle, and the antediluvian carboy still occupies half the show window. Paper labels on the drawers, ancient designed show cases, and a general air of "don't come in unless you want physic," give them anything but an attractive appearance. I speak of the average store, for there are some that are superior to these, but very few. The stock differs in some respects. We often carry lines of goods not belonging to a legitimate drug business, and our sundries goods branch is greatly enlarged. The Australian does a more legitimate drug business, his sundries being confined mostly to toilet requisites, etc. In India the drug store is generally a department of a general merchant's establishment, consequently wholly pharmaceutical, the druggist attending only to this department. The handsome soda fountains customary in our stores find no place in Australian establishments, nor in India, but in the latter place the business of bottling aerated waters is connected with and a part of the drug business. Did the climate permit people to walk the streets of Indian cities during the summer as we do here, the fountains would hold high carnival there, but only those venture about in the sun who are compelled to do so; hence there are but few white people about during the hours, when the fountain is expected to appeal to their patronage. One might say, "But there is a large evening trade for soda-water by pedestrians." Granted; but in India the stores all stand back from the streets in lots, and the pedestrians at night are few in number, the stores being closed at dusk, one clerk remaining about the premises in case of a call. The usual apartment for patents is customary to all and the trade is similar in each country, except that there are more American patents on the Australian and Indian shelves, than vice versa. The cigar case usually found at the entrance of our drug stores is also absent in the other countries, the Australian druggist not selling the weed, and the Indian druggist selling them by the box only. There is small reason to do otherwise in India, when cigars sell at thirty-five cents to \$1.00 a hundred.

There is considerable difference in prescription work, India and Australia being somewhat similar. Blanks are not furnished physicians as in this country, the doctor providing these himself, and they are as a rule about three times the size of our ordinary blank, and why they should be so I have never been able to determine. If it were the custom as with us, to retain the original prescription, the file would present a very ragged sight, so many sizes of paper being used; but in Australia and India, the prescription belongs to the patient and must be returned. This entails much more work in dispensing than with us, but the facility in referring to old prescriptions is far preferable than raking through a dusty file. A good plan when time will admit, is to daily copy the prescriptions and renew entirely from the book. The form of label is similar to ours, except that in all cases the physician adopts the very commendable practice of writing the name of the patient. This name is put on the label and the doctor's name omitted. It is a most important item in dispensing and it would be a great improvement if our M.D.'s would practice it. In Australia, Latin directions are the rule, while in India they are in English, certainly the proper way, and it seems absurd that a system that allows the patient to retain the prescription, should not also adopt English directions, which would be a guide and check on the dispenser. Mixtures are of larger quantities than ours, the average being six and eight ounces, but the doses are in proportion, and a favorite practice is to direct the doses in parts, for instance, one-sixth part, one-fourth or one-eighth part, every two hours, etc. This necessitates a graduated paper being pasted on the bottle. I prefer our own method. Empty capsules are not used, but capsuled pills as prepared in America are used to a

great extent. Many coat their pills with French chalk, but they are not desirable.

The Australians and Indians have much to learn yet in coating pills for the market, their best being very inferior to ours. Few spread plasters are used, another point wherein they are in the rear. The manner of printing "The Mixture," "The Liniment," etc., on prescription labels, is customary in all stores in the two countries mentioned, and I believe it is a step backward for us to be giving up the idea, for such seems to be the case. The old labels were not suitable to the advance in the designing of the present labels, but a very pretty label, with the names as above, can be printed, which looks very neat on a bottle, and may often prevent mistakes. It may surprise some when I say that in prescription work the most complete I have seen done, is that in the drug stores of India. Bottles of all descriptions are kept in stock, flint and blue glass, from the smallest up to quarts. Blue bottles are always used for external remedies, and the corks capped with red sealing wax; mixtures, etc., with black wax. All labels are "The Mixture," "The Ointment," etc.; then there are the slips—"Caution," "Poison," etc., and each bottle is capped with a Hunt's bottle cap; "Poison" caps for that sort. A bottle is never refilled when brought in for that purpose, but a clean bottle always used, no matter whether for mixture or liniment. The slightest soil on a pill box or powder box label is reason for a new box. Distilled water is always used unless specified otherwise, and many druggists make a practice of silver-coating all pills prescribed, unless otherwise ordered. Every bottle of drugs sold is capped, and no parcel is sent out unless wrapped in a second paper enclosing the label. Prices seem to rule the same in the three countries. The penmanship of prescriptions cause the same trouble the world over; some good, some bad, and some that Webster has no words to describe. But for pure "cussedness" and unintelligible scrawl the "cake" must be awarded to a physician I met in Tasmania. This man was a member of the English College of Surgeons, a well educated man and a fine physician, but with a handwriting that gave one neuralgia to look at. He never used any blanks, but always selected the dirtiest piece of paper he could find, and never wrote on two pieces of the same shape, but, from the looks of the prescriptions, took peculiar delight in making as many shapes as possible. He started off with something that was meant for a name, but looked as if his pen had run riot. He then spread himself over the paper, brought his directions up in a line to see how the "riot" was getting along, and then lost them in a new prescription he was writing from another corner. Half a dozen prescriptions on the same paper, and no two written in the same direction. This would have made little difference had they been legible, but one had to do some tall guessing to read them. We always had a "picnic" at the store about once in three months. He took quarterly trips to the tin mines, and while there prescribed for patients who came to him. He took a big sheet of white paper, and on this sheet went the prescriptions, each one written as the paper happened to be lying when the patient came in. Each had a name, but all looked the same; each had directions, but it was seldom with the prescription. When he had a sheet filled he would post it down with instructions to dispense and send to the parties mentioned. The whole force of the establishment then went to work and solved the puzzle as best we could.

There is a better cash business conducted in this country than in Australia. Credit business in Australia is very general, and the majority of accounts run yearly. In India nine-tenths of the business is credit, but accounts are collected monthly. There is a great loss, though, and as the statute of limitations is only three years there are

many opportunities for swindling one out of a bill. Salaries of clerks are better here than in Australia. A firstclass clerk in Australia can seldom get over \$18.00 a week, while the majority are paid about \$10 to \$12.00. In India salaries increase with time of service, and a good man can, at the end of five or six years, be drawing \$200.00 a month and over. The hours of business in Australia are similar to ours, while in India they are during the day, only with one in calling distance after dark.

I have endeavored to point out, as far as possible, the points of difference between the respective countries mentioned, and summing Up my reflections on the subject, I cannot but think that we have surpassed the two countries in all that pertains to Pharmacy and that we are now able to hold our own with any of the countries of Europe. May the good work go on, and may we come to that state when to be a druggist means that every such man has won his way to that position by an apprenticeship, a College Diploma, and a moral character that gives him a high position in the community in which he resides

JOHN A. FALCK.

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