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MEDICATED WATERS.

BY JOSEPH W. ENGLAND, PH. G.
Read at the Pharmaceutical Meeting, January 15, 1884.

The term "Medicated Waters" is applied in a general sense to all those aqueous liquids holding in solution the volatile oils of plants, or in some cases the stearopten of a volatile oil e. g. Aqua camphoræ. This definition is only partially adhered to by the Pharmacopoeia which also admits under the same heading, aqueous solutions of certain odorous gases and liquids not directly derived from plant life. Through misplacement, therefore, Aqua ammoniæ, Aqua ammoniæ fortior, Aqua chlori and Aqua creasoti have been classified among the officinal waters, the position of which, it is thought, from their composition should have been among the "Liquors." The present paper will deal only with the waters first named; that is those derived from volatile oils; and will have for its scope the various methods of preparations employed, explanations of the several advantages and disadvantages peculiar to each; while a substitutive process will be offered and the principles involved in the workings of the same set forth.

The U. S. Pharmacopoeia of 1870, in the formulae for these waters, gave in all cases, either one or the alternative of two processes. First: Distillation of the odorous part of the plant with water, after previous comminution and maceration if necessary; or, second: Trituration of the volatile oil of the plant with magnesium carbornate, the addition of distilled water and filtration.

During the process of "distillation" the water carries over with it in suspension the vapor of the oily product used and both are condensed in the receiver in separate layers. The oily portion is separated by suitable apparatus, leaving the water impregnated with its taste and fragrance. The fragrance is at first masked with a foreign odor that gradually dissapears on exposure to air; leaving the true one, partially modified to one of finer quality, through the supposed presence of certain volatile

acids and compound or mixed ethers. Distillation while admittedly the best in comparison with the present methods pursued, is to a great extent in the limited uses of most pharmacists impracticable for general employment. It requires for its successful exercise, the manufacture on a large scale, great care and skill on the part of its operators, and the use of vegetable products of quality seldom found in commerce to secure the best results. Its general application, therefore, is far from being a universal one.

The process of triturating the oil with magnesium carbonate is directed for the property possessed of reducing, mechanically, the size of the oily globules in order to present a greater surface to the solvent action of the water. The main objection to its use, rests upon the fact of its appreciable solubility in distilled water and to a still greater extent, when ordinary water containing in solution, as it usually does, carbonic oxide. The medicated waters thus made and holding in solution this alkaline-earth salt may, when prescribed with alkaloids, their salts or certain metallic oxides, precipitate them from solution on standing and possibly lead to grave and serious results. To overcome this defect the substitution of paper-pulp, chalk, pumice stone or charcoal has been proposed. These, however, are poor expedients and all fail through their inherent lack of the necessary power of diffusion of the oily ingredient upon trituration. The advantages of the “Trituration Process” to the general pharmacist are so manifold that they scarcely need comment. The readiness of manufacture on a small scale, the short time necessary for its performance with results equally satisfactory, except in a few isolated instances, and the cheapness of preparation are a few of the points of value which yield it preference for general usage.

The late revision of our recognized authority discards, entirely, the use of the “Trituration Process” and employs in its stead a method which consists, simply, in the distribution of the oil, in small portions at a time, upon cotton; picking the same apart after each addition until the whole is thoroughly impregnated with it, packing in a conical glass percolator and displacing with distilled water. The exceptions to this mode are bitter almond water, prepared by direct solution of the oil in water by agitation, rose and orange flower waters made by distillation. A practical acquaintance with this process does not impress one with either its worth or general utility. Its supposed advantages are more than counterbalanced by the very unsatisfactory results arising from its use. In the first place when the oil is added to the cotton, no matter how

faithfully its dissemination may be executed, a large proportion is necessarily lost upon the fingers in picking the fibres apart. Then when it is placed in the percolator, if packed too loose, the added water rushes through without dissolving any of the oil. If too tight: the process is impeded to such an extent that percolation becomes impossible. The right degree of packing is hard to obtain and when secured yields but little better results. As to the use of distilled water, very few follow the pharmacopoeial directions in this particular. Without exceptions, all pharmacists with whom the author has conversed, substitute ordinary water and claim in extenuation, that extreme purity of that liquid is unnecessary, and that they are perfectly justified in the replacement from the fact that distilled water is frequently of a musty, unpleasant odor, vapid and disagreeable taste and as likely may contain metallic impurities from the uncertain, careless methods of commercial manufacture; further their efficiency is called into question from the physiological fact that distilled water is difficult of digestion and not as acceptable to irritable stomachs. These statements may be regarded as extreme, yet it must be admitted that the greatest efficiency of all medicines is desired, in a physiological sense as well as a pharmaceutical one. If the reasons advanced are tenable and do not arise from economic considerations they are certainly worthy of further notice. Certain it is that the products made by them, seem to give equal satisfaction with those made by standard authority. In whatever way we view the U. S. (1880) process, its wasteful and objectionable manipulations are so evident, that if the imperfections in the directions of the earlier Pharmacopoeia (1870) were open to severe comment, those of the latter (1880) are doubly so by comparison.

As previously stated, the greater the subdivision of an oil, when brought in contact with an aqueous solvent, the larger the quantity that will necessarily be taken up in solution. As an aid to this fact and also their supposed insolubility, rests the adaptability of the bodies mentioned above as diffusive agents. Some of the objections to the use of magnesium carbonate and several of its proposed substitutes have already been noted. Upon trial I have found precipitated calcium carbonate to be preferable, mechanically, to the magnesium salt; yet it is open to the same adverse criticisms. Another possibly important objection to the use of alkaline earth carbonates, which has not been previously discussed, may reside in the fact of the presence of odorous volatile acids, ethers, etc., in the volatile oils used and the neutralization of those acids by the alkaline carbonates, to form neutral and inodorous

bodies, which may or may not be soluble. This view is a plausible one when we consider the delicate chemical constitution of the oils in general, especially those containing the previously mentioned compounds. Upon this fact may be based the superiority of “Distilled” over “Triturated” waters, as in distillation the water is impregnated with the oil direct and unchanged; while in trituration, if performed with carbonates, some changes undoubtedly ensue, since the products from the latter process are of less fine qualities than those of the former; although both may be made from the same oil. It is absolutely necessary on this account, to use a body free from these objectionable features and one which has all the essential requisites in the greatest degree. After numerous trials I have found precipitated calcium phosphate to possess all the desired properties and to yield products that were in all respects the equal of those obtained by distillation.

This lime salt is a neutral, impalpable solid, wholly insoluble in water, neutral or carbonated, and when used permits nitration much more readily and effectively than any other medium. In diffusive power it is fully the equal of any of the bodies previously mentioned; leaving nothing to be desired. Before its use, although generally very pure, tests should be always applied to determine that fact. It should be wholly soluble in dilute hydrochloric acid without effervescence (absence of carbonates). Its washings with distilled water should yield no opalescence or precipitate with test solutions of silver nitrate (absence of chlorides), barium chloride (absence of sulphates) or ammonium oxalate (absence of soluble lime salts).

When diffusive agents are used, they require long and persistent trituration with the oil to effect thorough and minute subdivision. In order to promote this diffusion, a plan of diluting the oil with a small quantity of alcohol was tried and found to work admirably. The presumed presence of alcohol in medicated waters thus made, has no foundation in fact, if the directions in the general formula, hereinafter given, are followed, as the rubbing to dryness, necessarily volatilizes the whole of it.

General Formula.— “Triturate, in a mortar of broad surface, the oil dissolved in the alcohol, with the precipitated calcium phosphate, until a dry powder is secured and all the alcohol has volatilized, then add the water in small portions at a time, stirring after each addition, until the intended quantity to be made is completed. Lastly, filter; returning to

the filter the first portions, if cloudy."

The following formulae, under each heading, are expressed in two ways. One according to the method of the U. S. P. of 1870, and the other like that of the U. S. P. of 1880.

Aqua Anethi, Br.—Oil of dill half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of dill 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Anisi, U. S.—Oil of anise half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of anise 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Aurantii Florum, U. S.—Oil of neroli (Bigarade) twelve minims, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of neroli (Bigarade) 2 parts, alcohol 15 parts, precipitated calcium phosphate 20 parts, distilled water a sufficient quantity to make the finished product weigh 2,500 parts.

Aqua Amygdalæ Amaræ, U. S.—Oil of bitter almonds 15 minims, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of bitter almonds 1 part, distilled water a sufficient quantity to make the finished product weigh 1,000 parts. Dissolve the oil directly in the water by agitation. Since 1 part of the oil is soluble in 300 parts of water, no further directions are necessary.

Aqua Camphoræ, U. S.—Camphor two drachms, alcohol one and a half fluidrachms, precipitated calcium phosphate four drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, camphor 8 parts, alcohol 6 parts, precipitated calcium phosphate 15 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts. Reduce the camphor in a mortar to a thin, smooth paste with the alcohol, add the precipitated calcium

phosphate, and proceed as in general formula.

Aqua Cinnamomi, U. S.—Oil of cinnamon (Ceylon) half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of cinnamon (Ceylon) 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua, Foeniculi, U. S.—Oil of fennel half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of fennel 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Menthæ Piperitæ, U. S.—Oil of peppermint half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of peppermint 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Menthæ Viridis, U. S.—Oil of Spearmint half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of spearmint 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Pimentæ, Br.—Oil of allspice half a fluidrachm, alcohol one and a half fluidrachms, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of allspice 2 parts, alcohol 6 parts, precipitated calcium phosphate 8 parts, distilled water a sufficient quantity to make the finished product weigh 1,000 parts.

Aqua Rosæ, U. S.—Oil of rose six minims, alcohol one fluidrachm, precipitated calcium phosphate two drachms, distilled water a sufficient quantity to make the finished product measure two pints. Or, oil of rose 2 parts, alcohol thirty parts, precipitated calcium phosphate 40 parts,

distilled water a sufficient quantity to make the finished product, weigh 5,000 parts.

In conclusion, the author, in advocating the adoption of the preceding formulae would say that any means used to insure success, are always secondary in importance to the quality of the materials used. No process, however good in itself, can hope to remedy defects in the qualities of its ingredients, or the hasty, careless manipulations of its operators. With these guarded against, there need be no disappointment in the results obtained.

OLEUM BETULÆ LENTÆ.

BY GEO. W. KENNEDY, PH.G.

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In a paper on this subject, read at the last meeting of the American Pharmaceutical Association, I stated that I had considerable correspondence with distillers in reference to the manner of extracting the oil and to the details of the process. After the analysis made by Mr. Pettigrew ("Amer. Jour. Phar.," 1883, page 385), in which he failed to find a terpene in oil of birch, and maintained that on this account it was not identical with oil of teaberry, Prof. Maisch suggested to me in conversation that perhaps the hydrocarbon was lost in the distillation of commercial oil of teaberry either by carelessness or through ignorance of the distiller, or by some defect in the process of extracting it. I immediately put myself in communication with several manufacturers for the sole purpose of ascertaining from them full particulars, more particularly as to the separation of a light oil floating on the surface of the distillate. The replies to these communications, excepting one or two, were alike. To the first interrogation, as to the process of extracting the oil, I find the modus operandi to be very much the same; there is little or no difference. To the second inquiry, as to the separation of a light oil, with one or two exceptions I was informed that this was of frequent occurrence, had been noticed by them for a long time, and was known in the birch fields by the names of "light ring" and "ight oi.l" I was also informed that no care was taken to secure it, as it was considered worthless, of no value whatever, and that it was allowed to run off over the receiving vessel (see "Amer. Jour. Phar.," 1882, page 49).

After such strong proof from the distillers, and similar assurance from two reliable pharmacists, who handle hundreds of pounds of the oil, with whom I was in communication, I came to the conclusion that —provided the oil was properly and carefully extracted—it would contain a hydrocarbon, and it was owing to this strong evidence that, at the Washington meeting, I unhesitatingly said that there was no reason why the oil should not contain the terpene. I believe, under the circumstances, I was justified in so speaking. The interesting discussion which followed the reading of my paper threw out suggestions which caused me to make further investigations.

It was my intention to spend several days in the birch woods, as I had invitations extended to do so, and witness the process of distillation more critically than I did on former occasions, but I was unable to fix a time to suit the convenience of all parties interested, owing to the small amount of oil made. During the past few months the stills were not in operation, the price of the oil being too low to compensate the distillers for their labor. However, my friend Mr. O. M. Briggs, a pharmacist of Carbon county, to whom I am much indebted for many favors, spent a day at one of the best stills in the region, which is worked by a man who thoroughly understands his business, and he obtained for me the product of the distillation of 600 pounds of material, which I here exhibit. The large jar (Mason's fruit jar) contains the oil just as it was made, with some water and dirt. Owing to an accident, about six ounces of the oil were lost. The yield was about one pound, or one-sixth of one per cent., which was small. The amount of "milk" (or water impregnated with oil), condensed in the exhaustion of the bark, amounts to 30 gallons. The jar was used as the receptacle for the oil, and was placed in a pail; as the pail fills with the "milk" it is emptied into a barrel, and put away to be used for another "run," as it is called, meaning the next distillation. The bottle labeled milk is a sample of the product nearing the close of the distillation. When received it was quite milky, but now the oil has separated, and of course the milkiness has disappeared, but by agitation it can be restored; the oily globules of a dirty color can be seen at the bottom of the vial. The "milk"contains about 2 ounces of the oil in every 25 gallons. The pieces of birch exhibited have had the oil taken out, and will give an idea as to the size of the pieces used in the extraction of the oil.

There was also another bottle received by the writer, marked "unknown," and said to contain "light oil," or "light ring," exclusively,

and which, from previous information received, was considered to be a hydrocarbon. The vial contained 4½ fluidounces, which was reported to me as having been skimmed from five pounds of oil before it was rectified, or just as it came from the still; it was in two layers, and decidedly dirty, the layers occupying about an equal space in the bottle. After freeing it from dirt, by straining through flannel, the layers were separated, and upon examination the light upper layer was found to be nothing but water impregnated with oil. Its specific gravity at 70°F. is 1.001. The lower layer proved to be the oil, the specific gravity of which was taken, and found to be the same as that examined last year, 1.181 at 70°F., thus indicating that it was principally methyl salicylate. This oil was next submitted to a chemical analysis in the same manner as described by Mr. Pettigrew: 50 grams of the oil were decomposed with 25 grams of potassium hydrate, by boiling for six hours upon a sand-bath; at the expiration of this time the oil was perfectly decomposed, and, upon cooling, crystals of salicylate of potassium were obtained, and a clear distillate, without oily layer, nor was such produced upon dilution with water. This observation manifested conclusively the absence of a hydrocarbon. To get at the percentage of salicylic acid and methyl alcohol was the next step taken. The salicylate of potassium, formed as indicated above, was decomposed by hydrochloric acid, which liberated the salicylic acid in small whitish crystals, requiring only to be drained and subsequently recrystallized from ether. The amount obtained from 50 grams of the oil was 40 grams, or about 80 per cent. Another bottle, presented herewith and marked “impure,” contains the acid as it is set free from the potassium salt. This was obtained from an old oil, made last year, and has not been recrystallized.

I then proceeded to obtain the methyl alcohol from the oil decomposed as described; the liquid portion was distilled from a sand-bath, until one-fourth the entire amount had passed over; this was redistilled, obtaining one-fourth as before, and this product, to get rid of the water, was distilled twice from lime. The methyl alcohol thus obtained, which is also shown, approximates 8½ grams, or 17 per cent. This added to the acid yield would still leave a discrepancy of 3 per cent. to be accounted for.

The rectification (as it is termed) of the oil, to which I referred a year ago, is accomplished by simply straining or filtering through cotton and flannel.

The yield, as I have already stated, from the distillation made Dec. 26,

1884, was small; it required $7^{1}/_{2}$ hours' time to make the pound obtained. In the spring, when the sap is in the trees, the yield is from 25 to 35 per cent. larger, and the time consumed one to two hours less.

In concluding this paper I would state that I have endeavored to get all the information it was possible for me to obtain; also, that if all the "light oil" or "light ring" is like that examined by me, there should be no difficulty in giving it a name. The two samples of oil examined, of which one was a year and the other but a few days old, contained no terpene, and the result agrees with Mr. Pettigrew's observation, that oil of birch is nearly pure salicylate of methyl. The "light oil" so called by distillers, is shown to be water and oil; if the chips and dirt were removed from the distillate the oil and water would readily separate.

VARIETIES.

EFFECT OF ALUM GARGLES UPON THE TEETH.—M. Young ("Courier Med."), prescribed a gargle containing a small proportion of alum for a woman suffering from chronic pharyngitis with catarrh of the middle ear. The patient, finding relief, continued its use for some three weeks. But perceiving that, at meals, her teeth began to crumble into little pieces, she consulted her dentist, who considered it due to the alum gargle, as when the enamel is removed from the teeth the alum breaks down the dentine. To prevent this it is best, immediately after using an alum gargle, to wash the mouth out with a solution of bicarbonate of soda or an alkaline water. —*Med. and Surg. Reporter.*

MINERAL WATERS.—When one day there comes to be written, from the standpoint of modern science, a history of human superstition, those chapters of the work which deal with belief in the various virtues from time to time accredited to waters, either of miraculous or of natural origin, will assuredly not be either the shortest or the least interesting. No one who has visited one of the springs which occur in almost every rocky range from the Grampian to the Pyrenees, and which a ready faith invests with supernatural curative power, can see much reason to expect that such belief will suffer measurable diminution for many generations. With the mineral spring proper the case is different; and while it seems long to look back to the time when the temples to Esculapius were erected near to such sources,. and while it is true that even to-day much mysticism is allowed to surround the subject, the

chemist of the age is in a position to assert that the curative action of any given mineral water is a result of the combined therapeutic action of the sum of its constituents.—*Medical Press: Louisv. Med. News.*

USE OF MILK SUGAR.—Dr. V. Poulain believes that the reason that cow's milk so often disagrees with children is to be found in the fact that cane sugar is used to sweeten it. In the *British Med. Jour.*, June 30, 1883, he says that for thirty-three years he has used the sugar of milk with the best results.—*New Eng. Med. Monthly*, January, 1884, p. 190.

SALICYLAGE.—This is the term applied to the practice resorted to in Paris of using salicylic acid as a preservative of food and drinks. The question of its injurious effects was recently referred by the government to Prof. Brouardel, who reports as follows: 1. The daily use of even the smallest dose of salicylic acid is unsafe, its innocuity not having been as yet demonstrated. 2. It is certainly dangerous for the subjects of lesions of the kidneys or of the liver from old age or by some degenerative process. 3. The prohibition of salicylage should be strictly maintained.—*Med. and Surg. Pep.*, Jan. 19, 1884.

PILOCARPINE.—Dr. James Murphy considers the use of pilocarpine, on account of its diuretic and diaphoretic properties, a valuable adjuvant in the treatment of puerperal eclampsia, as it reduces arterial tension at once, and gives our other remedies time to act. He reports two cases, in which it acted very favorably, in the “"Am. Jour. Obstetrics," Dec., 1883. He used it hypodermically in doses of $^{1}/_{3}$ of a grain.—*Med. and Surg. Rep.*, Jan. 12.

VERBASCUM THAPSUS.—Dr. F. J. B. Quinlan (“Brit. Med. Jour.,” Dec. 8, 1883) reports a case of pre-tubercular phthisis in which the patient gained twelve pounds in weight in one month under the use of mullein. He considers that it possesses all the advantages and none of the drawbacks of cod liver oil. (See also “Amer. Jour. Phar.,” 1883, pp. 267 and 580.)

CONVALLARIA MAJALIS.—Dr. W. S. Gottheil, House Physician of Charity Hospital, New York, contributes to the “Therapeutic Gazette” for January, 1884, a detailed account of his use of convallaria majalis in fifteen cases, comprising organic heart disease, cardiac failure in acute rheumatism, hemorrhages or phthisis, and one case of Bright's disease. The results would seem to justify a thorough trial at the hands of the

profession of this proposed substitute for digitalis. It possesses the very important negative property of producing no cumulative effect, a desideratum which has been long felt by the profession.

DISTILLATION OF WINE. By S. Kiticsan.—The author having repeated Liebermann's experiments (“Ber.” [15], 154, 438, 2554) on the distillation of wine, finds that the distillate contains ammonia and formic acid, and that the precipitate produced on addition of silver nitrate contains organic silver salts; Wartha's method ("Ber." [15], 437) for detecting sulphurous acid in wines is therefore untrustworthy. Old wines contain from 0.0057— 0.034 per cent. of ammonia.— *Jour, Chem. Soc.*, Oct., 1883 ; *Ber.*, 16, 1189.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

- *The Extra Pharmacopoeia of Unofficial Drugs and Chemical and Pharmaceutical Preparations.* By Wm. Martindale, F.C.S., late Examiner of the Pharmaceutical Society and late Teacher of Pharmacy and Demonstrator of Materia Medica at University College. With references to their use abstracted from the medical journals and a Therapeutic Index of Diseases and Symptoms. By W. Wynn Westcott, M.B. Lond., Deputy Coroner for Central Middlesex. Second Edition. London : H. K. Lewis, 1884. 16mo, pp. 330.

As the title indicates, this little work is intended as a supplement to the British Pharmacopoeia. Considering that this standard was published in 1867, and that since that time only a few formulas have been added by the general Council, under whose authority the Pharmacopoeia is issued, it is evident that such a supplement must have been very much needed. That such was the case was shown by the exhaustion of the first edition within a few weeks. The second edition now before us is enlarged by the addition of a number of new drugs, chemicals, formulas, and references to therapeutic uses, and of a therapeutic index.

The drugs and chemicals are given in the alphabetical order of their Latin names. In a few cases incorrect old names have been retained, though their recognized correct titles are given as synonyms, and this fact is pointed out in the text. Thus chrysarobin appears in the list as “Acidum chrysophanicum,” and butylchloral hydrate as “Crotonchloral hydras.” The alkaloid “caffeina” is mentioned a second time as “theine,” under its English title like the alkaloid theobromine. Drugs and chemicals recognized by the British Pharmacopoeia are introduced only

in case new preparations of the same are given. With the exception of these pharmacopoeial drugs, all are briefly described by their most prominent characters. Then follow formulas for the various galenical and extemporaneous preparations into which the drug enters, and finally, under the heading of “References,” the uses which are made of the same with references to the works or journals where these applications have been described. From the fact that a number of eclectic preparations have been admitted by the author under their commercial incorrect names, though they have been properly characterized as the powdered extractive, etc., it would appear that these remedies are more employed in some parts of Great Britain than they are in some sections of the United States.

It will be seen from the foregoing that the “Extra Pharmacopoeia” covers a good deal of ground interesting to the pharmacist and to the physician, and will be useful as a handy work of reference concerning the leading facts, established, or at least reported, of non-pharmacopoeial drugs. Such always have been and will continue to be prescribed; but it is to be regretted, that in the place of definite chemicals and of mixtures of known composition, preparations are largely used, which are introduced under a chemical name, but of which little else is known. For this, however, the authors are not responsible, and they have selected of these only a limited number, and have not withheld the results if unfavorable to the pretended virtues.

We cheerfully recommend the work as a very useful one, and state in conclusion that also a foolscap octavo edition of it is about to appear.