preparations capable of adjustments to a prescribed standard. *Hyoscyamus muticus* (Egyptian henbane) has been permitted entry for the manufacture of hyoscyamine. Marjoram has been adulterated with *Coriaria myrtifolia*, a poisonous plant.

The activities of the Bureau are being extended to the control of crude drugs produced in the United States and to providing standards for those not recognized by the Pharmacopoeia or National Formulary. Standards are being determined for Aspidium, Pennyroyal, Unicorn root and many other drugs used extensively in medical practice. The Viburnums have been studied. The description of *V. opulus* in the 8th edition fits *Acer spicatum* and does not apply to the true *V. opulus* and in consequence practically all *V. opulus* on the market formerly was *Acer spicatum* and many standard Viburnum preparations contained none of the true drug.

The situation regarding mustard is very acute at the present time. Russian and German mustards are out of the market and Great Britain has recently placed an embargo on English mustard. Consequently many new types of Brassica are offered for entry, some of which are pungent and others not, and the Department has to be continually on the alert to prevent the flooding of the market with spurious and worthless mustard seed.

PHARMACEUTICALS OF THE UNITED STATES PHARMACOPOEIA.*

BY J. LEON LASCOFF.

Nearly seven years have elapsed since the United States Pharmacopoeial Convention assembled in Washington on May 10, 1910, to revise the pharmacists' book of standards. Thirty-eight states were represented, as well as the Governmental services and National Medical and Pharmaceutical organizations. One year ago the Pharmacopoeia was completed for issue; six months later it was ready for distribution; and on January 1 it became official.

It has been very gratifying to me to be chosen to prepare a paper on the pharmaceuticals of the new Pharmacopoeia, to embody the criticisms of the practical pharmacist, and to present them for discussion.

The average pharmacist is very likely to accept the new Pharmacopoeia in a perfectly matter-of-course manner. To the one who has been behind the scenes, and is conversant with the process of revision, however, the vast amount of work done, the responsibilities entailed, the sacrifice of time, and the energy devoted, without thought of remuneration, the work of revision appears of monumental proportions and calls for praise and admiration of the "men behind the guns," the men who did the work and the chairmen of the various sub-committees.

In New York the Board of Pharmacy has thought it necessary to compel pharmacists to obtain and keep in their possession copies of both the Pharmacopoeia and the National Formulary. In other states, however, such compulsion does not exist. The pharmacist may or may not own these valuable books, as their fancy may direct. And yet to me it seems that these should be not only on the

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shelves of every pharmacy, but as a ready reference guide, both should be in the possession of every practicing physician as well.

In comparing the U. S. P. VIII with the later edition, U. S. P. IX, we find many changes. I am not going into details as to the chemicals, as these were thoroughly discussed at the previous meeting, but will deal with the pharmaceuticals only.

While I have studied all these preparations *seriatim*, I will mention here only the more important ones in which the method of preparing has been altered or the finished product has been changed in appearance and taste. For instance: It is hardly worth while to mention such changes as that in

Diluted Hydrochloric Acid, in which the water has been increased from 219 to 220 Cc., or in

Diluted Hypophosphorous Acid, in which the water has been increased from 200 to 210 Cc.

Diluted Hydrocyanic Acid.—The U. S. P. VIII gives a method of preparing this, but the U. S. P. IX describes the method of assaying only.

Diluted Nitric Acid.—The dispensing pharmacist should not discard his old pharmacopoeia when he buys a new one, for in cases such as this he will have to fall back on the old pharmacopoeia as a guide. It seems strange that though formulas for the dilution of most important acids are given, none appears for diluted nitric acid.

Waters.—Recently boiled water is directed for use in the preparation of medicated waters. This was not required in the old pharmacopoeia.

Sterilized Distilled Water is one of the additions to the new book. It is of great importance and its introduction is commendable. The Revision Committee took into consideration the fact that a good many medicated waters not official in the U. S. P. are prescribed, such as lavender water, sambucus water, etc.; it is impossible to enumerate them all. The general working formula is given under the title *Aquae Aromaticae*.

Cantaridal Collodion.—The drug is extracted with acetone and glacial acetic acid instead of with chloroform as in the U. S. P. VIII.

Flexible Collodion.—Camphor is used in place of Canada Turpentine as in the U. S. P. VIII.

Styptic Collodion is transferred from the Pharmacopoeia to the National Formulary IV. Alcohol and ether are omitted and Flexible Collodion is used in the place of Collodion.

Infusion of Digitalis.—The omission of alcohol is very important, as it will discourage the pharmacist from keeping the preparation on hand. The physician usually expects a fresh infusion of digitalis, and I suggested in my paper at the Boston meeting of the A. Ph. A. that alcohol be omitted for this reason.

Ammonia Liniment.—Alcohol and Oleic Acid are omitted. Sesame oil is used in place of cottonseed oil. This liniment of the new United States Pharmacopoeia is far superior to that of the old United States Pharmacopoeia. There is no separation and it keeps better.

Solution of Magnesium Citrate.—Hot water is used, oil of lemon and syrup replace syrup of citric acid, 2.1 Gm. of sodium bicarbonate, compressed, in place of 2.5 Gm. of crystals of potassium bicarbonate. The process of manufacturing

is different from that of U. S. P. VIII. There is no doubt in my mind that the changes are all good, yet this may lead the pharmacists to purchase the preparation from manufacturers instead of preparing it themselves. Vast amounts have been bought ready-made before and these changes may lead to still larger purchases.

Compound Solution of Cresol.—The addition of alcohol improves this preparation. It has also been improved and the cost reduced by using sodium hydroxide in the place of potassium hydroxide.

Mass of Mercury.—One gramme of oleate of mercury is used in preparing 100 grammes of the mass. This was not employed in U. S. P. VIII. This change is very commendable, as it facilitates work.

Compound Licorice Mixture.—The use of antimony and potassium tartrate instead of the wine of antimony saves the work of preparing the wine of antimony.

Mucilage of Acacia.—The use of distilled water instead of lime water is commendable, as it will discourage the pharmacist from keeping large quantities of this preparation on hand and also will avoid the reaction of the lime water with many chemicals with which it is incompatible.

Oleate of Mercury.—The use of alcohol for triturating the mercuric oxide in place of the water is very convenient, as time is saved, alcohol being more readily evaporated.

Oleoresins.—Ether is used in making extractions instead of acetone in preparing the oleoresins of aspidium, capsicum, pepper and ginger.

Syrup of Orange.—Purified talc takes the place of magnesium carbonate. This change is not satisfactory. Longer time is required for filtration and the finished product is not so clear as when the magnesium carbonate is used.

Syrup of Wild Cherry.—The process of manufacturing has been changed to conform to the U. S. P. VII, as the pharmacists were not satisfied with that of the U. S. P. VIII.

Compound Syrup of Sarsaparilla.—Syrup is used instead of sugar and water. This is also true of many other syrups and elixirs, and much time is saved by the change.

Tincture of Iodine.—Fifty mils of water are now added, which is a great improvement, as the ingredients are easily dissolved. I regret to say that a good many of the samples collected which were prepared according to U. S. P. VIII did not come up to the standard. This may have been due to failure in dissolving all the iodine. There should be no excuse for this now.

Tincture of Kino.—The *modus operandi* has been greatly improved. The finished product is far superior and is quite stable.

Tincture of Nux Vomica is now made by percolation of the powdered drug and not from the extract. The standard adopted is based on total alkaloids as recommended by the Brussels Conference of 1906. The old pharmacopoeia directed merely a solution of the extract. This caused a wide variability in color and strength, as no alkaloidal assay was prescribed. An assay is required. The galenical as produced by many pharmacists previously was of unknown strength and therefore of variable effect. But I must state that the process requires care

and time (two hours). The work, however, is not impossible for an intelligent pharmacist.

Ointment of Phenol.—The strength is reduced to 2.25 percent from 3 percent. This prevents separation of phenol on standing. The reduction in strength is also commendable.

Elixirs of the National Formulary.—The use of syrup instead of sugar and water is a great improvement. It is understood, however, that this must be strictly U. S. P.

Elixir Ammonium Bromide N. F. is made more palatable by the change.

Elixir of Calcium Lactophosphate N. F.—The ingredients have been entirely changed and the process of manufacture is made very simple.

Elixir of Ferric Pyrophosphate, Quinine and Strychnine N. F.—This preparation is one of the new additions to the National Formulary. Care must be taken that *Elixir Ferri Pyrophosphatis* is not confused with the old U. S. P. *Elixir Ferri Phosphatis.*

Solution of Ferric Oxychloride N. F.—This contains less iron, almost double the amount of ammonia water, 125 mils of glycerin, and less hydrochloric acid than that of the N. F. III.

Solution of Iron Albuminate.—Elixir of peptonate of iron and elixir of peptonate of iron and manganese can easily be prepared by the pharmacists providing the elixir of oxychloride of iron is freshly and properly made. Physicians are frequently desirous of having their mixtures of good color and taste. For this reason they prescribe Lactopeptine Elixir or elixir of lactated pepsin in combination with other chemicals. We have in the National Formulary several galenicals which may appeal to the medical profession, as solvents, adjuvants or correctives. Among them are Aromatic Elixir, Tincture of Caramel, Tincture of Saffron, Tincture of Cudbear, Compound Tincture of Cudbear and Compound Wine of Orange.

PILLS.—I will say just a few words in regard to pills. There are thirty-two pills in the National Formulary and seven in the United States Pharmacopoeia, a great many more than in the old editions. There is also a paragraph on pills which reads as follows:

> "Pills are globular or ovoid dosage forms of medicinal substances intended for administration by the mouth. Each pill weighs not less than 0.06 Gm. nor more than 0.5 Gm. If they weigh less than 0.06 Gm. and more than 0.02 Gm. they are usually designated as "Parvules." The standard and popular formulas for pills are prepared in large quantities by the pharmaceutical manufacturers and many ingenious machines for their manufacture and coating have been devised."

Therefore, when a physician prescribes a small pill, such as of yellow mercurous iodide 0.01 Gm., the pill should not weigh more than 0.06 Gm. When the physician prescribes a pill of this kind and the pharmacist dispenses it of 5-grain size or as high as half a gramme he is discouraged and it leads him to prescribe an official pill, specifying a special manufacturer. I have already referred to this subject at some length in a paper read before the Atlantic City A. Ph. A. meeting, but the importance of it justifies this brief reference to it here.

There are about twenty-seven changes in galenicals of the United States

Pharmacopoeia and about seventy-three in the National Formulary. I have enumerated these in my paper on "Uniformity in Dispensing," which was read at the last annual meeting of the American Pharmaceutical Association.

First and foremost, then, it is the duty of the pharmacist to see that his preparations are not only elegant in appearance but also active in their ingredients. A thorough working knowledge of the appearance and properties of the essential drugs is a *sine qua non* for the man who sets out to manufacture his own preparations according to the United States Pharmacopoeia.

The question arises, are the changes which have been made practical from the point of view of the dispensing pharmacist? Is it true that some of the galenicals are so difficult to prepare that most of the retail pharmacists will buy them from the manufacturer direct instead of preparing them himself? As shown on several occasions, the opinion of the majority of the pharmacists is that the Pharmacopoeia should be made as simple as possible in order to encourage pharmacists to manufacture these preparations on their own premises instead of purchasing them and pouring the galenicals out of one bottle and into another as they do when a proprietary article is prescribed. We fully realize that there are some pharmacists who buy preparations from the manufacturers no matter how easily the galenicals can be prepared. I know of a good many instances where ointment of zinc oxide, tincture of iodine, chloroform liniment, tincture of green soap, and even solution of magnesium citrate are purchased from manufacturers.

If the pharmacists take this course they discourage the work of the Committee on Propaganda. The work of this committee has been to encourage the medical men to prescribe U. S. P. preparations, but if the pharmacist buys these from the manufacturer the doctor will go back to the prescribing of proprietaries and all the work and energy of the Committee on Propaganda will have been exerted in vain.

It is true that some of the preparations are difficult to manufacture, but it ought to be a matter of pride on the part of every pharmacist to turn out a satisfactory product, complying in every way with the method and formulas laid down in the Pharmacopoeia, and he ought to have satisfaction in seeing that the finished product of his own handiwork is not only elegant in appearance, but is also effective and satisfactory to the prescriber.

It was very gratifying to me to hear Professor LaWall at the last meeting express in vigorous language his condemnation of the pharmacist who will carelessly or wilfully compound preparations from chemicals intended for technical use only. As far back as June 1911, at a meeting of the New York State Pharmaceutical Association, I had occasion to call the attention of pharmacists to this fault. At that time I said:

> "Your reputation depends a great deal upon what you sell; but if you buy right you certainly sell right. The purest drugs give the best results and it is results that we are looking for, and they will reflect upon you and gain for you a reputation. Buy all your proprietaries as reasonably as possible, best discount and best figures; but when drugs and chemicals are bought, price should not influence you. The best is the cheapest in the end. Watch the following labels: "For technical use," "pure," "U. S. P. or C. P."

What will it avail the pharmacist to put all skill and care into his compounding if he works with non-official chemicals? What will be the value of galenicals prepared in this way? The difference in price between U. S. P. and those labeled for technical use is so small that I do not see why the pharmacist should not insist upon getting chemicals of the prescribed character to work with.

I quote from the introductory notices of the United States Pharmacopoeia, and which read as follows:

> "Medicinal substances must conform to U. S. P.—Owing to misconceptions on the part of those familiar with pharmacopoeias, it is necessary to make the following statement:
>
> "Standard of purity and strength, prescribed in the text of this Pharmacopoeia, are intended solely to apply to substances which are used for medicinal purposes or in determining the identity or purity of such substances."
>
> "Some misunderstanding has also prevailed in the past with regard to the strength or purity of articles directed to be used in formulas or in testing. The words 'alcohol,' 'syrup,' 'glycerin,' or any other official title when used in this text and not otherwise specified is understood to mean the official article. In the case of alcohol, it is official alcohol 94.9 percent by volume that is intended and not absolute or dehydrated alcohol. 'Syrup,' when not otherwise specified, is intended to mean syrup of the official strength and quality. Official preparations are to be made from drugs that conform to the official definitions, tests and descriptions."

It must be borne in mind that there are a great many pharmacists who do not care to put up their own preparations. They may have a very small prescription demand, and it would be unprofitable for them to manufacture their own galenicals. It is perfectly proper and legitimate for these to buy their preparations from reputable manufacturers. But it is well for these pharmacists to remember that when they sell a preparation, they, themselves, become personally responsible before the law for the character and standard of the article sold. It behooves them to purchase only from reliable manufacturers, to see that all their preparations are labeled U. S. P. or N. F., and if they wish to be completely protected, either to assay the preparations or to have them assayed. It would be almost impossible for the average druggist to assay liniment of camphor, for, as Doctor Mayer has already pointed out, at a previous meeting, the analysis of this preparation would require the use of a polariscope and familiarity with this method of assaying. It would also be difficult for the average druggist to assay tincture of nux vomica according to the pharmacopoeial method.

In conclusion, pharmacists must bear in mind the fact that the Pharmacopoeia and the National Formulary are both books of legal standards, and no matter where or by whom galenicals are made they must be made strictly in accordance with the standards set down in those books. The Committee of Revision of both works deserve to be highly complimented for their excellence. We know that there is always room for criticism, but we must remember that it is impossible to suit everyone, and this is the task set for the Committees of Revision.