

SUGGESTIONS FOR THE REVISION OF THE UNITED STATES
PHARMACOPOEIA.*

BY H. H. RUSBY.

The first suggestion that I have to offer is that the next Committee of Revision should endeavor to profit by investigations made by preceding committees and by the conclusions so reached. Each Committee of Revision expends, in the aggregate, a large amount of time and effort in studying special questions. The results of these studies, incorporated into the Pharmacopoeia, should remain there until the new Committee has gone fully over the ground of its predecessors and shown their conclusions to be in error. This course is often not pursued, the new committee taking up the work *de novo* and going ahead with its changes without due consideration. The result is often a reversal of previous results, not because of a more exhaustive study, but because of insufficient study, and especially through ignorance of the work previously done in Pharmacopoeia revision. The very first place to which a new committee should turn for information regarding any subject under consideration should be the files of reports, correspondence and discussions of *all* previous committees in relation to that subject. Those results should then be judged in the light of information secured since that time. As an illustration, I will refer to the perennial proposition to introduce 50 percent tinctures to the Pharmacopoeia. A special sub-committee studied this question experimentally, their work extending over a period of several years, and concluded that the plan was not workable, except in a few cases. That report should be the basis of all future study of this question, but it is not likely to be made so unless a definite plan is inaugurated for rendering the files of previous committees easy of consultation. The question of introducing maximum doses was most thoroughly studied and freely discussed, and the method shown to be dangerous. It is again to be urged at the coming Convention. The first step in deciding it should be to read all that was written by the members of the preceding Committee. Will this be done?

My suggestion in this connection is that a special sub-committee of the present Revision Committee should make a general index to the proceedings of all previous committees, and that every question studied by the newly appointed Committee should be first studied from these files.

My second suggestion is that there should be a close coöperation between the revisors of the U. S. P. and those of the N. F., with the object of securing greater uniformity of procedure regarding subjects treated in both books. For example, where doses of preparations of a drug appear in both books, they should be mutually consistent. The nomenclature of the two books also should agree, as well as the classification and spelling. In the case of disputed points, a correct result is more likely to be reached by such coördinated work than by that of each body working alone.

The proper treatment of certain families calls for special study, by the appropriate sub-committee.

The Leguminosae.—There is a steadily growing opinion among taxonomists that the groups *Mimosaceae*, *Caesalpiniaceae* and *Papilionaceae* are of family

* Read at the meeting of the New York Branch of the A. Ph. A., February 9, 1920.

rank, rather than that of sub-families, as they have heretofore been mostly treated.

The Rosaceae.—The same may be said of the *Drupaceae*, *Malaceae* and *Rosaceae* proper, heretofore treated as sub-families of the *Rosaceae*.

The Liliaceae.—I am clearly of the opinion that the *Melanthaceae*, *Convallariaceae* and *Alliaceae* represent families distinct from the *Liliaceae*, with which they are mostly grouped as sub-families. It may be that the *Trilliaceae* should be regarded in the same light, although I am personally not quite so clear on this point.

Acacia.—This should be referred to the family *Mimosaceae*.

Acidum Salicylicum.—When this product is of synthetic origin, that fact should be stated on the label, and the same thing should be done in the case of its salts.

Acidum Tannicum.—There appears to be no good reason why the origin of this acid should be restricted to nutgall, provided that it complies strictly with the description. Myrobalan yields an equally good product.

Aconitina.—There seems to be no good reason why the origin of this alkaloid should be restricted to "Aconite," unless the definition of the latter is extended to include Japanese Aconite.

Aloe.—Family *Dracaenaceae*.

Amygdala.—Family *Drupaceae*. An important botanical question which ought to be decided is whether the species referred to *Prunus* by most botanists, but producing pink flowers and having a foveolate stone should not be segregated as the genus *Amygdalus*. This division would of course include the peach as well as the almond.

Asafoetida.—The definition should say "by incising the living root," instead of "the root." The ash allowance should not be more than fifteen percent. To allow more invites adulteration, since no commercial lot of asafoetida ever contains more than this amount unless intentionally adulterated.

Aspidium.—I never find any *D. marginalis* in commercial *Aspidium*, and do not know that any evidence has ever been adduced to prove that it is equally efficient with the genuine Male Fern. The activity of this drug is a matter of such great importance that no doubtful product should be admitted under it.

Balsamum Peruvianum and *B. Tolutanum.*—Family *Papilionaceae*.

Belladonnae Folia.—I renew my recommendation that this definition should be made to include stems not more than 7 mm. in diameter.

Belladonnae Radix.—The definition excludes "more than 10 percent of stem bases and other foreign matter," but hard woody crowns have less activity than the stem bases, rather than more. I therefore, recommend that this should read "not more than 10 percent of stem bases, woody crowns or other foreign matter."

Benzaldehydum.—When this product is of synthetic origin, the label should be required to so state.

Buchu.—The whole subject of buchu requires investigation. While it is true that the two official species are probably equal in efficiency, yet they are sufficiently different to enable anyone to distinguish them by their odor and taste. Hence, both the drugs and their preparations should always bear a statement to indicate the variety. There are several other species of *Barosma* which may be equally efficient and equally entitled to a place in materia medica. The sub-

committee on therapeutics would confer a great service if they would investigate this question.

Camphora.—The definition says "a ketone derived from *Cinnamomum camphora*; it is dextrogyre." This is not good form for a definition. Only in case that the plant yielded more than one ketone should the definition specify that such ketone is dextrogyre. This statement should form a part of the description and not of the definition. If introduced to the definition at all, it should be defined as "a dextrogyre ketone derived from," etc.

Cannabis.—The naming of the "variety Indicum" is superfluous. The name of a species always includes its varieties, unless these are excluded. For example, if the typical form is not to be included, we should say "of *Cannabis sativa Indica*." If, on the other hand, this variety were not included, we should say "of *Cannabis sativa typica*." Both being included, the name of the species "*C. sativa*" is all that should be used, since this is always regarded as being comprehensive. If there were any serious question as to whether Indica is a variety or a distinct species, then, of course, the present form might stand; but this idea has now been abandoned by everyone. The fact that a certain form of definition is used in the German Pharmacopoeia is a very poor reason for blindly incorporating it into our own. The idions of languages differ so greatly that it might easily be that one form would appear appropriate in one language which would be in violation of the spirit of another language.

Chrysarobinum.—Family *Papilionaceae*.

Rheum.—The same remarks applied above to *Cannabis* apply equally well to the use of "variety *Tangutricum*" of *Rheum palmatum*.

Glycyrrhiza.—Family *Papilionaceae*. In the case of this drug, it is mere servility to blind leadership that has led our Committee to call *Glycyrrhiza glandulifera* a variety of *G. glabra*. Even those who do not know the plants ought to be able to recognize the fact that the marked differences in the characters of the two roots prove specific distinction between the plants yielding them.

Capsicum.—The use of the name "*Capsicum frutescens* L." constitutes an acceptance of the view that there are but two species of *Capsicum*, namely *C. frutescens* and *C. annuum*. It is exceedingly doubtful whether this is true. Although one author claims so, another admits no less than seventy species. Undoubtedly the truth lies somewhere between these two extremes. However, if we accepted this classification, the name "*C. frutescens*" would necessarily include a great number of varieties, only a very few of which are capable of meeting the requirements for medicinal use. Either "*Capsicum minimum*" or "*Capsicum fastigiatum*" would be acceptable. The latter has priority and is about as good as the former.

Cardamomum semen.—The description of this seed does not sufficiently exclude the so-called camphor seeds, which have always been a common and abundant admixture in objectionable shipments of cardamom seed. I have frequently rejected lots containing as much as fifty percent of this adulterant, but one would hardly be able to do so by depending only on the U. S. P. description.

Cascara Sagrada.—By the unfortunate change in the title of this drug, a purely Castilian name has been made to stand as "the official Latin title." Although "Cascara Sagrada" might well stand as the official English title, since it has be-

come fully anglicized by its general use, it seems to be a decided linguistic error to make it stand as the Latin title.

Cocaina.—Our organic chemists, as well as our botanists, should certainly do something to improve this definition. Much cocaine is made by artificial changes in the alkaloid truxilline, after its extraction from truxillacoca. Therefore, it can scarcely be defined as "obtained from" that leaf. Even if it were, the term "variety" cannot be correctly applied to the Truxilla leaf. I have fully established the fact that this is a distinct species, and have so described it, with illustrations. I have also shown that no other name can properly be applied to it than "*Erythroxylon truxillense*."

Copaiba.—Family *Caesalpiniaceae*. It has recently been claimed on good authority that African copaiba imported since the publication of the present edition of the U. S. P. is of good quality. I do not know that this is true, but the subject is worthy of investigation.

Gambir.—This should be specified as "A dried aqueous extract" instead of "a dried extract."

"*Gossypium herbaceum*."—Should be *G. hirsutum* L.

Grindelia.—Owing to the great and necessary uncertainty as to the botanical source of any particular lot of *Grindelia*, coupled with the fact that preparations of all the species are practically identical in character, it seems unwise to name the species. I have found by personal experience and through much correspondence that the effect of such specification tends only to confusion. It would not be a bad idea to specify a minimum amount of oleoresinous extractive to be yielded through a specified process of extraction. There actually is a wide variation in the quality of commercial lots, but this is quite as likely to exist between two lots of the same species as those of two different species. The specification of the amount of the extractive would do a great deal toward producing uniformity.

Guarana.—So far as we can learn, from the descriptions of those familiar with the process of preparing this drug, the present definition is faulty in various ways. Not "the seeds," but their kernels, that is, the seeds deprived of the tests, are present in the product, and these have been subjected to a roasting process before being moulded into rolls. If this information is correct, the definition should read "a dried paste consisting chiefly of the crushed or powdered roasted kernels of the seeds," etc.

Hydrastina.—When this alkaloid is of synthetic origin the label should be required to so state.

Hyoscyamus.—Should include stems not above 7 mm. thick.

Ipecacuanha.—I have not been able to find any publication of the name "*Cephaelis acuminata*" Karsten. Engler and Prantl refer the plant to *Psychotria emetica* Mutis, but it is certainly not a *Psychotris*. The plant itself must be secured and studied.

Kino.—(Family *Papilionaceae*.) The statement that kino is the "spontaneously dried juice" appears to lack support. It is claimed by writers on Indian products that the juice is evaporated by artificial heat in shallow pans.

Limonis cortex.—If the fresh rind is required, that fact is not stated by saying "the rind of the fresh fruit," for such a rind could be dried after it was removed from the fresh fruit. We should say "the fresh rind."

Maltum.—It would be better to say “of one or more species or varieties of *Hordeum*.”

Oleum Amygdalae Amarae.—Family *Drupaceae*.

Oleum Aurantii.—This definition is a sort of botanical curiosity, saying as it does “from *Citrus Aurantium Sinensis* and its varieties.” *Citrus Aurantium Sinensis* cannot possess varieties since it is itself a variety. If this specification is desired at all, the form should be “*Citrus Aurantium* and its varieties.” It would be better, however, to omit all reference to varieties since the name of the species is understood as including them unless there is a specific exclusion.

Oleum Caryophylli.—In this definition, we have printed both the name and the synonym, which is tautological. Either name would suffice, so long as its authority is correctly given, although the correct one should of course be selected. There is also a question as to whether the peduncles of the flowers should not be included in the source of the oil, since they seem to be largely used in its distillation. Of course they are properly excluded from the definition of cloves, because the percentage of oil present in them is very small.

Oleum Cassiae.—This definition says “from *Cinnamomum Cassia*,” whereas it should say from the bark of that species.

Oleum Chenopodii.—The plant should be “*Chenopodium anthelmenticum*” as a species, and not as a variety of *C. ambrosioides*. A more important question, however, is whether there is any justification for restricting the source of this oil to the former species. The other one is very much more abundant and common, and I think it extremely likely that both are used indiscriminately as the sources of the oil.

Oleum Cubebae.—It has been quite generally claimed that the oil distilled from the ripe fruit is equally good with that from the unripe. In the case of the fruit itself, we do well to require the unripe article, since the ripe one contains much less oil. But as to whether the oil that we do obtain from the ripe fruit is of equal quality with that from the unripe appears to be an open question.

Physostigma.—Family *Papilionaceae*.

Pix Liquida.—All things considered, this is doubtless as absurd a definition as has ever been found in any edition of our Pharmacopoeia. “A product obtained by the destructive distillation of the wood” named might be any one of the following articles, or of a number of others which I do not name: tar, oil of tar, pix navalis, toluol, naphthol, naphthalin, creosote, guaiacol, cresol, paraffin, amylyl alcohol, acetic acid, smoke, lampblack or charcoal. A definition which leaves it open to question as to which of these articles is intended, is no definition at all. If a definition does not define, what is the use of having it? This is an excellent illustration of that pernicious tendency in Pharmacopoeia revision to make changes for changes' sake, with no sound reason for doing so and often against sound reasons to the contrary. When anyone undertakes to displace the work of Dr. Charles Rice, when so carefully performed as was his framing of this definition in the previous edition of the Pharmacopoeia, he must needs be a person of rare good judgment, as well as of full information. The former definition was “An empyreumatic oleoresin,” and it was about as nearly perfect as it can be made. The Committee of Revision should see to it that this definition is restored.

Prunus Virginiana.—Family *Drupaceae*. It appears now to be quite clearly

determined that Linne actually did have the plant yielding our official wild cherry bark when he named and described his *Prunus Virginiana*, and that we have been in error all along in calling the latter *Prunus serotina*. Another question arising in this connection is whether to separate those species now held under *Prunus* which bear their flowers in racemes, assigning them to the separate genus *Padus*. There is considerable of a disposition among botanists of the present day to hold *Padus* a distinct genus. While I have not at present any disposition to recommend such a change, I think that our botanists should give it careful consideration.

Quassia.—It seems desirable that the label of any lot of *Quassia* or of its preparations should bear a statement as to which of the varieties it pertains.

Rheum.—It is extremely doubtful if we do well in assigning this drug to "the rhizome and roots." The upper part of the underground structure, while a distinct crown, can scarcely be regarded as a rhizome.

Santalum Rubrum. Family *Papilionaceae*. It has recently been proposed by Farwell that the plant yielding Santonica should be called "*Artemisia maritima pauciflora*," as it was in a previous edition of our Pharmacopoeia, but I cannot regard the proposition as correct. The differences between these two forms are certainly of a specific rank. This case is much like that of the two *Chenopodiums*, but I think it is even stronger in that of *Santonica*.

Sarsaparilla.—Family *Smilacaceae*.

Scilla.—Family *Alliaceae*.

Senna.—Family *Caesalpinaceae*.

Sinapis Nigra.—From *Sinapis nigra* L.

Sparteinae Sulphas.—Family *Papilionaceae*.

Spigelia.—In view of the growing scarcity and increasing price of this drug, I renew a suggestion previously made to the Revision Committee, that *Spigelia anthelmia* and other abundant tropical American species of this genus should be studied in comparison with *S. Marylandica*, to determine their relative activity. I am inclined to think that they will be found even more active than our own species.

Stramonium.—I renew my suggestion that the definition of this drug should include stems not more than 7 mm. in diameter.

Taraxacum.—Certainly there can be no sound practical reason for calling this structure a "rhizome and root."

Theophyllina.—Family *Theaceae*.

Triticum.—When the definition of *Triticum* was so changed as to include roots as well as the rhizome portion, I foresaw the difficulties which should consequently arise. No careful manufacturer or pharmacist will make use of the root portions of this drug, even though permitted to do so by the Pharmacopoeia. The result is that all *triticum* of good quality continues to arrive with the root portion removed. Then the fact that the Pharmacopoeia permits the roots to be included leads to the mixing of the roots rejected from one lot with some other lot. The quality of the drug is thus degraded because the nodes with their roots possess very little activity. I have seen a shipment of this drug imported which consisted almost wholly of the nodes and roots. There was just enough of the rhizome present to justify its being classed technically as "rhizome and roots,"

so that it was admitted by the authorities, with the result that practically inert preparations were placed upon the market.

Veratrina and Veratrum.—Family *Melanthaceae*.

POSOLOGY.

The posology of the Pharmacopoeia is in special need of revision, a fact that I realized upon the occasion of a recent examination of my students in this subject. Most of the men taking this examination have had considerable experience in the pharmacy and are familiar with the doses usually prescribed. When called upon for the average doses of a number of articles, those given were in most cases conspicuously larger than the average doses given in the Pharmacopoeia. The incident merely served to show, what I think is generally recognized among medical men, that most of the doses of the U. S. P are too small.

A more serious defect is that of inconsistency between the doses of drugs and their preparations, the ratio between such doses differing widely from that between their respective strengths. The same want of uniformity is seen between two preparations of the same drug.

It would take too long for me to review here all the doses of the book as to this feature, but I submit the following as typical illustrations:

Balsam of Tolu and Balsam of Peru.—The principal active constituent of these two drugs is benzyl-benzoate, of which balsam of Peru contains from six to ten times as much as does balsam of Tolu, the inert resin of the latter being nearly three times that of the former. In spite of these facts, the U. S. P. assigns the same dose for both.

Senna.—The dose of the syrup is the same as that of the fluidextract, notwithstanding that the latter is four times as strong.

Logwood.—The extract is nearly eight times as strong as the fluidextract, yet the dose is half as large.

Myrrh.—Tincture of Myrrh is of 20 percent strength; that is, it is only one-fifth as strong as myrrh itself, yet its dose is only twice as great.

Aconite.—The dose of this drug is half a grain; that of the extract, one-sixth of a grain, or a third as large. An eighth of a grain would bear the proper relation to the dose of the drug.

Camphor.—The spirit is one-tenth as strong as the drug, but its dose is only five times as large.

Cimicifuga.—The dose of the extract is a little more than a fourth that of the drug, but it is not likely that the yield of extract is in so large a proportion.

Regarding these solid extracts, it would appear to be highly desirable that they should be reduced to the powdered form and so adjusted that they shall bear a fixed ratio to the drug itself.

SUBSTITUTES FOR ALCOHOL IN MEDICINES.

BY H. C. FULLER.*

Some two years ago it was suggested to the writer that it would be worth while to investigate the possibility of developing some substitute or substitutes for alcohol as solvents and preservatives in medicinal preparations. The investi-

* Institute of Industrial Research, Washington, D. C.