But more puzzling still is the question why the Pharmacopoeia calls the thousandth part of a liter by two names. It is either a "milliliter" or a "mil" as one chooses. Mil as an abbreviation for milliliter is logical, and makes but one term for the article. But mil as a distinct and separate word means that the Pharmacopoeia is using two separate terms for one article. If mil is a proper designation for the article, why waste type and space in writing milliliter? If mil is "short" for milliliter it is properly an abbreviation, since nicknames are hardly in keeping with the dignity of the Pharmacopoeia. A milliliter, or mil, is a definite measure of capacity and admits of no variations. There are no permissible botanical species or natural and synthetic variations in the thousandth part of a liter, so two different terms for it do not appear to be in accordance with the habits of accuracy and explicitness which has characterized the Pharmacopoeia in the past. It should be either a milliliter, abbreviated mil., or it should be a mil and the longer word discarded.

It is generally understood that mil as a word was an afterthought. The Pharmacopoeia had been put into type, and the period after this term had been forgotten. Its absence was noted, and then to avoid the trouble and expense of punctuating the thousands of mils in the text, it was decided to call it a word instead of an abbreviation.

If this is so it but illustrates the need of time to think out the myriads of questions concerned in pharmacopoeial revision, to avoid making hasty conclusions. We venture to say that the idea of having two names for one article did not occur to the revisers. Five years to revise the Pharmacopoeia seems a long time to the man who is simply waiting for it, but when the need of thorough consideration for each of the many questions is noted, then one doesn't wonder that the mills necessarily grind slowly, and even then some chaff escapes.

Another habit which still holds is the aging of Tincture of Ferric Chloride. In the days of long ago when pharmacy was more of an art than a science, and when pharmacists made Solution of Ferric Chloride for use in the tincture, they were not so particular to drive out the last traces of nitrous oxide which is formed in the reaction. This small amount of nitrous oxide, in connection with the little free hydrochloric acid, formed a fragrant ester with the alcohol in the tincture and made a riper and more pleasant tincture. But now the Pharmacopoeia requires that the active agent in forming this fruity flavor be entirely removed from the ferric chloride solution, and still imagines that the ester will be formed according to the three-months rule. But if any is formed it requires some imagination to find it. The average nose will find it doubtful, at least, and the tongue will fail to recognize it. If our drug inspectors have any method of deciding whether a given sample of Tincture of Ferric Chloride is officially aged or not, I, for one, would be much interested in learning it. But the tradition must be honored, and the tincture prepared three months in advance of its use because our fathers—well, they made a better tincture than we do, didn't they? and we must honor their method but decry their science. Is this anything more than a habit?

Well, the Pharmacopoeia has shown that it can break as well as make habits, and perhaps the new Revision Committee will turn over a new leaf in some of the above respects when somebody is bold enough to call attention to them.

ORGANIC CHEMICALS OF THE UNITED STATES PHARMACOPOEIA IX.

BY GEORGE D. ROSENGARTEN.

In the revision of Organic Chemicals of the United States Pharmacopoeia, it has been the aim of the Committee to achieve accuracy, and in addition it has been the endeavor to employ explicitness in all statements combined with simplicity, and further to fix standards on a plane not beyond practical attainment, but affording the desired standard of therapeutic efficiency.

It may be noted that the texts of Organic Chemicals are considerably shorter, in many instances, than in the former revision. The reason for this is quite apparent, as many superfluous tests and statements have been discarded. The purpose of the Pharmacopoeia is the standardization of drugs and chemicals, and for this reason it matters not how a chemical may be produced, provided it possesses the required properties and meets the demands for purity. Manufacturing processes have therefore been omitted. A further contraction of the text was brought

about by deleting a number of superfluous identity tests, as it is evident that only such tests giving the most characteristic reactions of the substances are required, usually one or at most two may be quite sufficient, but there is no real necessity of going the limit and including tests which do not add to the value and only entail additional time and labor for no particular reason.

In the earlier revision the general statement under organic chemicals, that the substance on ignition wa. entirely volatile, and without residue, gave much difficulty. It is quite true that volatility on ignition is expected of organic material and theoretically correct, but it was intended only as a characteristic property and the trouble lay in the interpretation, because it is patent that if a sufficient amount of any organic substance be employed for such a test a point would finally be reached when a weighable amount of ash could be obtained. The U. S. P. IX corrected this by stating a maximum amount of residue, and the quantities of the substance used for the test were so chosen that if the ash exceeds the permitted limit it will weigh more than one milligram, a quantity which may be weighed with some degree of accuracy. Of course the greater the amount taken for this test the more readily the residue may be weighed but as many of the organic chemicals are very expensive, especially under present conditions, this test with appreciable amounts would become prohibitive. It was this consideration that led to the use of only 0.1 Gm. of such products as aconitine, atropine, homatropine, etc. A similar policy has been adopted throughout, by stating definitely the quantities of material and reagent employed in all tests.

The subject of melting and boiling points too, was replete with complications, and the subcommittee was confronted with an arduous problem. The situation in the U. S. P. is quite different from that of a research laboratory where the substance is crystallized and recrystallized and even then perhaps further manipulated before its physical properties are determined. It is not practical in the U. S. P. to give the melting points, *i. e.*, in tenths of degrees, and the reason for this is so plain that it need not be argued. It is conceded that melting and boiling points are considered very definite and fixed properties, but like every other physical, or for that matter chemical, phenomena, these "constants" are subject to certain conditions. The moisture contents of a substance, its state of division, the rapidity of heating and many other factors of manipulation, perhaps only negligible in themselves, yet collectively will certainly have a material bearing and affect results. To offset such troubles a reasonable range for these "constants" was introduced and a detailed procedure for their determination described.

New assays have been added for a number of chemicals. Many more have been proposed and urged upon the committee. They have been all very carefully considered. It has been proposed to introduce rubrics and assays for alkaloids and their salts. This, however, has not been done. The object of a rubric is either to insure the presence of the required amount of the active ingredient or to serve as a measure of the purity of a chemical or drug. If the purity of a substance can be determined by an assay only, an assay must be used. In the instance of the alkaloidal salts an assay of the proportion of alkaloid will serve no useful purpose. It may even be misleading. There are a number of instances in the U. S. P. where the presence of co-alkaloids is allowed and there are excellent reasons for permitting such conditions. In these cases an assay will usually include the total alkaloidal contents, and consequently must prove unsatisfactory. An excessive percentage of such co-alkaloids, however, is now precluded by special tests designed to cover any such possibilities. That an accurate assay for the determination of the proportion of alkaloid in alkaloidal salts is not easily accomplished is well known, and since such assays are only of tolerable accuracy they cannot become of real value as an index of purity. Why, therefore, should the Pharmacopoeia be burdened with them? The purity tests now used are sufficient to insure satisfactorily pure products. Is there any need for determining the percentage of strychnine in the nitrate or sulphate? There is but one step from the sublime to the ridiculous—a useful assay is sublime and a useless one is ridiculous. It can very well be stated that there is a superfluity of assays in the present U. S. P. The assay of resorcinol is of no value, and the rubric and assay for the percentage of mercury in metallic mercury is more than worthless as an indication of its purity. Practically any commercial mercury will test $99^1/_2$ percent or more. The satisfactory appearance of mercury in itself is a decidedly better index of its purity than the requirement of $99^1/_2$ percent. The assays of bichloride of mercury, sulphur and perhaps of many other chemicals could be deleted without impairing the quality of these products or of the standard of the U. S. P.

There is another feature in the Pharmacopoeia which may be considered. It is well known that there is quite a divergence of opinions among physicians as to the scope of the U. S. P. Without any inclination of discussing this point it may only be said that no sooner is a product dropped from the U. S. P. than the demand for it becomes unusually heavy. On the other hand there are certain materials which ought not find a place in the U. S. P. As an example Indigo Carmine or officially "Sodium Indigo Disulphonate" may be mentioned. The only use of this substance in the Pharmacopoeia is for coloring bichloride tablets. This alone is certainly an insufficient reason for incorporating indigo carmine in the body of the U. S. P. It is a tradition that whatever is used for pharmacopoeial preparations must be standardized, but it is necessary now to substitute practicability for tradition.

It has been endeavored to outline the general considerations that governed the revision of the organic chemicals. The pharmacopoeia has now been before the public for three years, and by this time there has been opportunity to become conversant with its merits and its defects. That there are some errors or inaccuracies in the 9th revision of the U. S. P. goes without saying. It is almost bound to be so, in spite of every precaution exercised. What may have been considered good and best five years ago may be poor and obsolete now, but every effort was put forth to make the U. S. P. a work to meet the demands of the time.

H. W. WILEY, *President*
U. S. P. Convention
1910-1920

CHARLES H. LAWALL, *Chairman*
Revision Committee
U. S. Pharmacopoeia