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THE AMERICAN JOURNAL OF PHARMACY

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ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL
ALCOHOL IN EXTRACTING THE ACTIVE PRIN-
CIPLES OF SOME OFFICINAL DRUGS.

BY EDWARD R. SQUIBB, M.D.,
Of Brooklyn, N. Y.

(Third Paper, Belladonna Root.)

In continuing this subject for a third paper—see AMERICAN JOURNAL OF PHARMACY for January, 1899, Vol. 71, No. 1, and Vol. 71, No. 7, for July, 1899, and *Ephemeris*, Vol. V, No. 3, for July, 1899, for the two preceding papers—the writer refers to without repeating the introductory matter of the first paper where the therapeutic and pharmaceutic bearings of the subject are discussed, and passes on to the farther work which is to be depended upon to support or oppose the proposed substitution, or ascertain the limits of its applicability.

The experimental trials and the actual use—chiefly in veterinary practice—of extracts and fluid extracts made with acetic acid have continued since the date of the last paper, until now the list embraces some sixty drugs and spices. This increasing experience tends to support two generalizations.

First, that a menstruum of 10 per cent. acetic acid is about the weakest that will surely extract, protect and preserve the active principles of many drugs, and that such a menstruum leaves not less than 6 nor more than 8 per cent. of free acid in the finished fluid extract, and is about equivalent as a menstruum to the officinal alcohol dilutum, or 41 per cent. alcohol.

Second, that from one-fourth to one-third of the fluid extracts

made with acetic acid give a small deposit within three months—a proportion not greater than from alcoholic menstrua, and that the deposits from the two menstrua are equally inert.

In selecting a third drug for competitive investigation in this paper, belladonna root was taken; first, on account of its importance; second, because its value depends on the proportion of a definite alkaloid of strong saturating power; and, third, because the writer has had much experience with it through many years.

In September, 1885, see *Ephemeris*, Vol. II, No. 11, pp. 848 and 853, the writer published papers on belladonna leaf and belladonna root, giving an assay process which, with slight modifications and with the addition of titration of the results, has now been in use for about fourteen years. This process is believed to be sufficiently accurate for all practical purposes, and is therefore adopted as the basis of this paper.¹

An abstract of this process, as amended in recent practice, is as follows:

OLDER ASSAY PROCESS.

Fifty grammes of the unpeeled belladonna root in No. 60 powder was equally moistened with 30 c.c. of 91 per cent. alcohol to which 4 drops of concentrated sulphuric acid had been previously added.

The moistened powder was then moderately packed in a narrow cylindrical percolator and 100 c.c. of 91 per cent. alcohol, acidulated with 4 drops of sulphuric acid, was poured on top as fast as the percolator would hold it, a stratum of the menstruum being always kept on top. As soon as the powder was completely filled, and dropping began from below, the outlet was closed and a digestion of twenty-four hours was allowed.

The percolation was then started and maintained at a slow rate of dropping, stopping overnight for a new digestion, until 425 c.c. of percolate was received. The farther supply on top was 100 c.c. more of the alcohol acidulated with 4 drops of the acid, another 100

¹ The use of a good process of assay in the buying of an important drug through a series of years is well illustrated in the writer's experience with belladonna root. In 1885 the best root of the market gave 0.46 to 0.50 per cent. of alkaloids. In creating a demand by rejecting lower grade samples and calling for unpeeled root the quality obtainable has increased from about 0.50 per cent. to 0.68 per cent.

c.c. acidulated with 2 drops of acid, and then 200 c.c. of the alcohol not acidulated.

The percolate was boiled down in a flask on a water-bath to about 10 or 15 c.c. of liquid extract, and this was diluted and washed clean into a separator with 25 c.c. of water acidulated with 1 drop of acid. The flask was then finally rinsed into the separator with 20 c.c. of chloroform, 99 per cent.

The whole was well shaken for five minutes, allowed to separate and the chloroform layer drawn off into a second separator.

The acid liquid was again washed twice in the same way with 20 c.c. of chloroform.

The 60 c.c. of chloroform washings in the second separator was then washed by gentle shaking with 15 c.c. of water acidulated with 1 drop of acid, the chloroform stratum was drawn off and wasted, and the watery stratum was added to that in the first separator.

Then 20 c.c. of chloroform was added to the contents of the first separator, and 6 grammes of sodium carbonate added in small portions as long as effervescence was developed by shaking.

Then shook well for five minutes, allowed to separate and the chloroform stratum drawn off into a tared beaker.

This washing of the alkaline solution was repeated twice when the tared beaker contained about 60 c.c. of chloroform solution of crude alkaloids.

The chloroform was evaporated off without boiling and left an amber-colored varnish-like extract that weighed 0.38 gramme = 0.76 per cent. crude alkaloids.

Upon this extract in the beaker 12 c.c. of decinormal sulphuric acid was delivered from a burette and the beaker was heated in a hot water-bath with rotary agitation until the soluble part of the extract was dissolved.

Then decinormal solution of potassium hydrate was dropped into the acid solution. The indicator used was narrow (4 millimetres) strips of blue and neutral litmus paper, touching the tip end to the liquid and cutting off the wet portion at each testing. The dropping in was continued until the liquid produced no change of color on either strip. Then after each additional drop or half drop the testing was made with the neutral strip. This was first touched to water, which wetted about 1 centimetre of the end, and then was

touched to the solution and held in contact for about ten seconds. Then on close inspection a bluish tinge was perceptible, indicating the finished titration.

12 c.c. of decinormal acid had been taken and 0.30 c.c. of decinormal alkali had been required to saturate the uncombined acid, leaving 11.70 c.c. saturated by the alkaloid of belladonna.

The molecular weight of atropine being 288.38, the calculation for the result was :

$$\begin{array}{r}
 .28838 \times 11.70 = .3374046 \times 2 = .67481 = \dots\dots\dots 0.675 \text{ per cent.} \\
 \text{Duplicate assay } \dots\dots\dots 0.685 \quad \text{“} \\
 \hline
 1.360 \div 2 = \\
 .680 \text{ average}
 \end{array}$$

For the many assays needed in the design of this paper a shorter assay process was needed, and one that could be applied to the differing fractions of percolate without too much sacrifice in accuracy of results. Such a process the new acetic acid menstruum seems to have supplied by taking the basis or design of the older process and cutting out some steps that could be shown to be dispensable.

THE NEWER ASSAY PROCESS.

Ten grammes of the unpeeled belladonna root, in No. 60 powder, was equally moistened with 5 c.c. of 10 per cent. acetic acid, the moistened powder was lightly packed in an extractor—A. J. P., 1899, p. 312; *Ephemeris*, p. 2313—(or some equivalent percolator), was filled to saturation with 10 per cent. acetic acid, was allowed to digest for twenty-four hours, and was then percolated to exhaustion, yielding about 200 c.c. of percolate.

This percolate was evaporated on a hot water-bath to an extract that was hard when cold, and weighed 3.96 grammes.

This extract was dissolved in 20 c.c. of a mixture of equal volumes of 91 per cent. alcohol and 10 per cent. water of ammonia, the solution transferred to a separator, 20 c.c. of chloroform added, the whole well shaken for five minutes, allowed to separate and the chloroform stratum drawn off into a beaker.

During the time required for separating, the wetted end of a strip of neutral or acid litmus paper was held in the vapor space of the separator in order to be sure of the full alkalinity of the contents.

Then 4 c.c. of 91 per cent. alcohol was added to the contents of the separator and shaken in. Then 20 c.c. of fresh chloroform, five minutes' vigorous shaking, with separation and drawing off the chloroform stratum into the beaker as before.

This addition of alcohol and chloroform, shaking, separating and drawing off was repeated for a third and final washing.

The chloroform solution was evaporated from the beaker without boiling, leaving a varnish-like extract that weighed 0.15 gramme.

This was dissolved in 6 c.c. of decinormal acid by water-bath heat and agitation, and was titrated back with decinormal alkali to the neutral point, using litmus paper indicator in the way described in the old process.

6.00 c.c. acid used less 3.65 c.c. free acid = 2.35 c.c. saturated with alkaloid,
 $.28838 \times 2.35 = .67769 = 0.680$ per cent.
Duplicate assay 0.680 " "

These percentages are true only to the second decimal place, and are, therefore, so stated. But they are usually trustworthy to 0.005 per cent. It is claimed, however, that a simple and easy process that will give a result true within this first range of error is more practically useful than a more elaborate process with half that range of error.

This is equivalent to stating the writer's conviction, long held, that for pharmacopœial purposes a process that five pharmacists out of ten can apply within a variable error of 1 per cent. of result is of more use than a more elaborate process that not more than one in ten can apply to within half that range of error of result.

The new process has been applied to the percolates as well as to the powder with the same degree of success, 10 c.c. of the stronger percolates being evaporated for each assay, and multiples of this volume for the weaker percolates.

Throughout the many applications of the new process it was found that unless the proportion of solid extract was required it was better not to carry the evaporation lower than to a thick liquid of 5 or 6 grammes, because it is much easier to wash it clean into the separator with the prescribed volume of the ammonia-alcohol mixture.

The one great difficulty in applying the "shaking out" process in alkaloidal assaying is the formation of emulsions. This difficulty is entirely avoided in this process by the use of alcohol: First to

dilute the ammonia, and afterward to replace the alcohol shaken out by the chloroform in each washing of the alkaline liquid. When this was done as prescribed in the process the separation was always prompt and complete, and the chloroform solutions were all fairly clear.

In dissolving the alkaloids out from the crude alkaloids by the decinormal acid, for titration, care, patience, agitation and a hot water-bath are needed, and the heat must be sufficient to fuse the resinous matter that is liable to hold the alkaloid from the acid.

The principal limitation to the accuracy of the new process is in the use of litmus paper as an indicator. By the use of the tip end of very narrow strips very little of the solution is lifted out and cut off at each testing, but there is a point at which the solution does not change the color of either the blue or the neutral paper where sometimes one and sometimes two drops are required to produce a faint bluish tinge near the middle of the wetted end of the neutral strip, and this difference of one drop sometimes affects the result in the second decimal place of percentage. If the drops be divided, or if centinormal alkali be used when the neutral point is near, a closer result may be reached, but this latter introduces a complication, and only reduces the error by about one-half, or from about 1 in 60 to 1 in 120.

COMPARATIVE PERCOLATIONS.

Five hundred grammes of the same No. 60 powder of the unpeeled belladonna root was taken for each of two parallel percolations, the two being carried through under the same conditions of time and management as nearly as practicable.

For one percolation the U.S.P. menstruum, consisting of 800 volumes of 91 per cent. alcohol and 200 volumes of water, was used, and for the other 10 per cent. acetic acid.

Each portion of powder was moistened with 200 c.c. of its respective menstruum, both were digested in covered vessels for twenty-four hours—packed in syphon percolators—fully saturated with menstruum, and digested for twenty hours. Then the syphons were started at a slow rate of dropping, and, stopping overnight, were kept nearly parallel to the end.

The percolates were received in 100 c.c. fractions in 100 c.c. narrow-necked, marked flasks, and were weighed to 1 centigramme.

The 100 c.c. of the alcoholic U.S.P. menstruum weighed 86.91 grammes, and the 100 c.c. of the acid menstruum, 101.21 grammes.

These weights, subtracted from the differing weights of the fractions, give the difference between the weight of the menstruum and the weight of the fractions, and thus give a useful indication of the rate and degree of exhaustion. Each successive five fractions were

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES AND BY ASSAY.

FRACTIONS OF PERCOLATE.	DIFFERENCES.		EXTRACT.		CHLOROFORM EXT.		ALKALOIDS.	
	U.S.P. Men- struum.	Acetic Acid Men- struum.	U.S.P. Men- struum.	Acetic Acid Men- struum.	U.S.P. Men- struum.	Acetic Acid Men- struum.	U.S.P. Men- struum.	Acetic Acid Men- struum.
C. C.	Gms.	Gms.	P. C.	P. C.	P. C.	P. C.	P. C.	P. C.
1st. 100 . . .	3'82	13'57						
2d. 100 . . .	3'63	12'92						
3d. 100 . . .	3'70	10'79						
4th. 100 . . .	4'05	8'12						
5th. 100 . . .	4'59	5'36						
1st. 500 . . .	21'48	51'85	12'7	30'1	2'30	1'30	0'634	0'605
6th. 100 . . .	4'57	3'62						
7th. 100 . . .	3'59	1'46						
8th. 100 . .	2'77	'72						
9th. 100 . . .	2'39	'51						
10th. 100 . . .	1'99	'42						
2d. 500 . . .	17'45	7'27	6'5	4'2	0'30	0'45	0'036	0'072
11th. 100 . . .	1'46	'33						
12th. 100 . . .	'99	'30						
13th. 100 . . .	'81	'18						
14th. 100 . . .	'55	'19						
15th. 100 . . .	'43	'09						
3d. 500 . . .	5'33	1'13	2'0	0'7	0'10	0'06	0'007	0'006
16th. 100 . . .	'33	'06						
17th. 100 . . .	'14	'12						
18th. 100 . . .	'20	'09						
19th. 100 . . .	'00	'00						
20th. 100 . . .	'00	'00						
4th. 500 . . .	3'14	'26	1'1	0'5	0'10	0'06	0'006	0'005
							0'683	0'688

put together and made up to 500 c.c. from the next following percolate, the differences taken, the percentage of extract and chloroform extract taken, and the percolate assayed for the percentage of alkaloid by the new process, the drops being divided roughly in the titration so as to bring the result into the third decimal place of percentage.

All these results are summed up in the above table.

This powdered belladonna root gave, on careful assay by the older process, between 0.675 and 0.685 per cent. of alkaloid calculated as atropine, and it is accepted as being very near to a mean of 0.680 per cent. Then, as the results are practically the same by the newer process, the indication is confirmatory of both processes and of their common result—0.680 per cent.

In reviewing the table a very remarkable difference is shown in both the rate and degree of exhaustion. The acetic acid menstruum extracts more than three times as much in the earlier fractions, and exhausts the powder more rapidly and more completely throughout.

The two extracts differ in the same direction, both in rate and degree, so that it is surprising to find the alkaloids differing in an opposite direction.

The powder contains 0.680 per cent. of alkaloids.

The first 500 c.c. from the U.S.P. menstruum contains 93.23 per cent. of this.

The first 500 c.c. from the acid menstruum contains 88.97 per cent. of this.

The second 500 c.c. from the U.S.P. menstruum contains 5.29 per cent. of this.

The second 500 c.c. from the acid menstruum contains 10.58 per cent. of this.

The third 500 c.c. from the U.S.P. menstruum contains 1.03 per cent. of this.

The third 500 c.c. from the acid menstruum contains 0.88 per cent. of this.

The fourth 500 c.c. from the U.S.P. menstruum contains 0.88 per cent. of this.

The fourth 500 c.c. from the acid menstruum contains 0.74 per cent. of this.

Sum of the percentages U.S.P., 100.43; acid, 101.17 per cent.

Sum of the alkaloids U.S.P., 0.683; acid, 0.688 per cent.

Thus it will be seen that the U.S.P. menstruum gives the largest yield of alkaloid in the early part of the percolate and much the smallest yield of inert and useless extractive matter, and is so far the better menstruum, but, for washing out the last portion of alkaloid, the acid menstruum has a slight advantage.

The management is equally easy in both, and, when both are finished to fluid extract by the U.S.P. directions, the preparations appear to be of equal value. The acid preparation is of much lighter color, has no deposit in three months' standing, and does not precipitate on being added to water.

The alcoholic preparation is of a very dark color, has a small precipitate within three months that contains traces of alkaloid, and precipitates on being added to water.

The acid menstruum costs less than 2 cents a pint (473 c.c.).

The alcoholic menstruum costs more than 24 cents a pint.

THE HISTORY OF THE CONSTITUTION OF THE ALKALOIDS.

BY A. R. L. DOHME, PH.D.

An alkaloid is defined differently by different authorities on the subject, one set of chemists considering it to be a derivate of the base pyridine, while another set of chemists consider it to be a substance containing nitrogen and possessing basic properties. The former class, headed by Pictet, do hence not consider caffeine, theobromine, ethylamine, etc., as alkaloids, while the latter, headed by Guareschi, include these substances in the class of alkaloids. As stated in a paper published some years ago, I am inclined to take the broader view of the case and consider an alkaloid to be any nitrogenous substance possessing basic properties and forming stable salts. Although the great majority of the alkaloids, as we shall see, are derivatives of pyridine, it seems to me to be unscientific to assume that all alkaloids are such, or that there is any organic connection between alkaloidal property and pyridine, for the day may soon come when an alkaloid is discovered that is not a derivative of pyridine, and is yet a pronounced alkaloid in possessing alkaloidal properties and pronounced therapeutic activity. And I must confess to know of no reason why, by an arbitrary standard, such a

well-known therapeutic agent as caffeine should be excluded from the family of alkaloids. As is well known, the word alkaloid is derived from the Arabic word alkali and the Greek word Eidos, and means "like an alkali." The word alkali is derived from the Arabic words Al and Kali, meaning "the potash." Alkaloids are like an alkali because they resemble the typical alkali ammonia in possessing alkaline properties, forming stable salts and at times being volatile, as in case of nicotine or coniine. They are the organic bases. There are two classes of alkaloids, vegetable and animal, and at first, in the early part of this century, chemists only considered the vegetable alkaloids as bases, assuming that the animal body only excretes substances of neutral or acid character and never basic character. Thus Liebig classed such products as xanthine, creatine, etc., as members of the family of the starches. Alkaloids have always been closely associated with the term active principle, and whenever an alkaloid was isolated from a drug, it was promptly heralded as its active principle. This is, of course, not the case necessarily, for in some drugs that contain alkaloids the active principle, as far as the use of the drug is at present put to in medicine, is not an alkaloid. Because they were considered the active principles of drugs, their discovery was a great factor in the development both of chemistry and of medicine, for physicians saw in them the first means at their command of administering exact doses, and chemists saw in them the dawn of an era which would bring chemistry closely in touch with medicine, and thus ennoble the science of chemistry and at the same time greatly increase its usefulness and importance. The words uttered by the great physician, Claude Bernard, are hence strictly in accord with the trend of medical and pharmaceutical thought ever since, "La premiere condition de tout progres pour la medicine, c'est l'emploi de substances bien définies qu'on puisse doser exactement, et dont il soit possible de mesurer les effets." From this we see that Claude Bernard was the father of chemical assaying, for he says the first condition of all progress in medicine is the use of substances that are well defined, and whose effects can be measured and which can be administered in exact doses. It is a curious fact that as far as is known nearly all vegetable alkaloids are derivatives of a substance which is a closed chain, while nearly all animal alkaloids are derivatives of substances that are open chains. As you all know, the first alkaloid isolated from

any plant was morphine, and the honor of the discovery belongs to the German apothecary, Friedrich Wilhelm Sertürner, of the little town of Einbeck, near Hannover, who, in 1805, isolated the alkaloid morphine and recognized its basic character. Baume, in 1802, had isolated a substance from opium, which he called "sel essentielle opii," and which he found to be the active principle, and Derosne, in 1805, and Seguin, in 1804, had also separated such a substance in crystalline form and of decided narcotic nature, but neither of them recognized the alkaline nature of the same. Sertürner's views as to the alkalinity of morphine met with no favor at the time, and it was not until he made a second and more complete study and published a second paper on the subject in 1817, that the scientific world accepted the same with any degree of credence. Then all of a sudden it dawned on this scientific world that a new era had dawned for chemistry, and that an epoch-making discovery had been announced by the modest young pharmacist of Einbeck. So great an authority as Gay Lussac was stirred by its importance, and he says in the *Annales de Chimie et de Physique*, "Nous sommes surpris que le premier memoire de M. Sertürner nait pas fixé plus tot l'attention des chimistes, non en France, ou il ne parait pas qu'il ait été connu, mais sur le reste du continent. La decouverte d'une base alcaline formée de charbon, d'hydrogen, d'oxygene et d'azote, dans laquelle les propriétés neutralisantes sout tres prononcées, nous parait de la plus grande importance." Sertürner did the first part of his work at Paderborn, in Westphalia, and the latter part of it in Einbeck. He recognized, besides the basic nature of morphine, its powerful narcotic properties, and attributed the narcotic properties of opium to it. He also showed that ammonia and magnesia can displace it from its salts with acids, while it, when in this free state, can displace iron, lead, copper and mercury from their salts. The alkaloid era had set in, and from this year, 1817, until 1835, chemists labored incessantly on the new class of alkaloids, as the following list of discoveries of new alkaloids will demonstrate:

- | | | |
|-------|----------------------|-------------------------------------|
| 1817. | Morphine | By Sertürner. |
| | Emetine | " Pelletier and Magendie. |
| | Narcotine | " Robiquet. |
| 1818. | Veratrine | " Meissner, Pelletier and Caventou. |
| | Strychnine | " Pelletier and Caventou. |
| 1819. | Brucine | " " |
| | Piperine | " Oersted. |
| | Delphinine | " Brandes. |

1820.	Cinchonine	By Pelletier and Caventou.
	Quinine	“ “ “
	Solanine	“ Desfosses.
1824.	Chelidonine	“ Godefroy.
1826.	Corydaline	“ Wackenroden.
	Berberine	“ Chevallier and Pelletan.
1827.	Conicine	“ Giesecke.
1828.	Nicotine	“ Posselt and Reimann.
1829.	Aricine	“ Pelletier and Corriol.
	Sanguinarine	“ Dana.
1832.	Codeine	“ Robiquet.
	Narceine	“ Pelletier.
1833.	Quinidine	“ Henry and Delondre.
	Atropine	“ Geiger and Hesse.
	Hyoscyamine	“ “ “
	Aconitine	“ “ “
	Colchicine	“ “ “
1835.	Thebaine	“ Pelletier and Thiboumery.

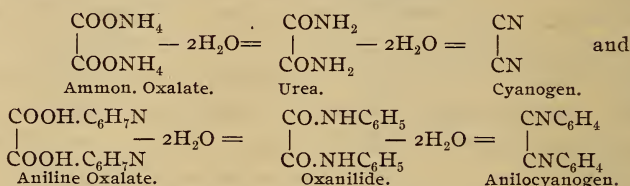
Every drug that possessed therapeutic virtue was examined for alkaloids, and as soon as these were isolated, they were examined by physiologists, who, in great number, were as much interested as the chemists. Magendie notably figured in these physiological experiments, as his celebrated “Formulaire,” published in 1821, bears witness. Of these many publications, perhaps the most classical and complete is that of Pelletier and Caventou, on “Cinchonine and Quinine.” The formula, *i. e.*, the composition of these alkaloids, was usually not determined by the investigator, but by the great analysts of the day—Liebig, Regnault, Laurent and Gerhardt. Knowing what the empirical formulas of these substances were, the next problem that naturally engaged the attention of the chemists was their constitution—how were these many atoms of these large and complex molecules combined and grouped. Two theories were at the time in vogue, and both were distinct and radically different. They were the conjugated theory of Berzelius and the amidogen theory of Liebig.

The former explained the constitution of the alkaloids by assuming that in them the ammonia was contained as such, and to it was conjugated the various radicals that caused the difference in properties, composition, etc., thus:

NH_3 ,	Ammonia.
$\text{NH}_3\cdot\text{CH}_2$,	Methylamine, or methyliak.
$\text{NH}_3\cdot\text{C}_2\text{H}_4$,	Ethylamine, or ethyliak.
$\text{NH}_3\cdot\text{C}_5\text{H}_{11}$,	Nicotine.
$\text{NH}_3\cdot\text{C}_6\text{H}_4$,	Aniline, etc., etc.

The latter, or Liebig's amidogen theory, assumed that all alkaloids contained the radical amidogen NH_2 , and that they were really ammonia in which one hydrogen atom was replaced by an electro-positive radical which was different for each alkaloid. This was in 1842. Both of these were merely the views or the theories of these two chemists. The first step in the illuminating of the ways was made by A. W. von Hofmann, a pupil of Liebig, and, strange to say, an adherent of the Berzelius alkaloid theory. It was in 1843 that Hofmann began his famous work on the substance aniline, which served the chemical world a twofold purpose—first, in establishing the aniline industry; and, secondly, in disproving the Berzelius alkaloid theory and establishing the Liebig theory of the constitution of these compounds. Unverdorben had in 1826 obtained a substance he called "Krystallin" by the dry distillation of indigo, and later, in 1840, Fritzsche, by distilling indigo with caustic potash, had obtained a substance, an oil, which he named aniline. Zinin, about the same time, obtained a substance he named "Benzidam," by the action of ammonium sulphide on nitrobenzene. You will note that I use the terminology *ene* for aromatic hydrocarbons, and not *ole*, as I frequently observe is done, and as is given in the U.S.P. Old and new teachers of chemistry give, as far as I know, the names benzene, toluene, xylene, etc., to these substances, and not benzole, toluole, xylole, etc., as the termination *ole* or *ol* is to be, and always has been, as far as I know, reserved for substances of an alcoholic nature, such as carbinol, phenol, resorcinol, etc., *i. e.*, such substances as contain hydroxyl. Hofmann, in 1843, fractionally distilled the heavy oil from coal tar, and obtained a colorless oil, which he called cyanol, and which he showed was identical with the krystallin, aniline and benzidam just mentioned. He tried the action of cyanogen upon aniline, and obtained cyananiline, cyanodiphenyl-diamine, or, as he called it, melaniline and dicyan-melaniline, all bases and addition products. He still thought that his work so far demonstrated the correctness of Berzelius' view of conjugated compounds, and he writes these compounds $\text{NH}_3\text{C}_6\text{H}_4$, equivalent to aniline; $\text{NH}_3\text{C}_6\text{H}_4\text{CN}$ equivalent to cyananiline, etc. He now tried to split up aniline into ammonia and phenyl, its two conjugated radicals, but, of course, failed. He next applies a rigorous test to the Berzelius theory by studying the action of phosphorus pentoxide, a powerful dehydrating agent, upon oxanilide, arguing

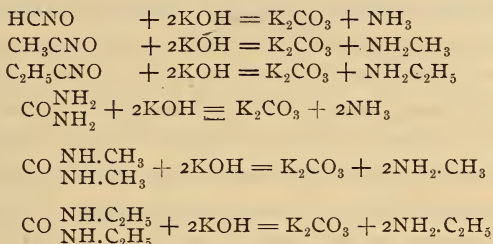
that if this substance abstracts water from ammonium oxalate and yields cyanogen as a final product, why should it not yield anilocyanogen, as he calls it, from aniline oxalate.



He obtained all these products except the last—anilocyanogen, but never succeeded in getting it. Why this peculiar action of aniline? asks Hofmann. Berzelius' theory stays or falls with it; and, as it could not be coaxed into existence, Hofmann looks to Liebig's theory to explain the trouble, and at once sees that the last stage is impossible, since the last molecule of water could not be removed without splitting up the radical phenyl, and, as we all know, phenyl is a pretty stable radical. After converting himself to his master Liebig's theory, Hofmann starts out on a new line of work. If aniline is a substituted ammonia, says he, why, then, if I treat it with ethyl bromide, I ought to replace one of the hydrogen atoms by ethyl.

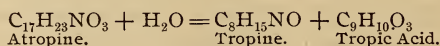
Sure enough, by the action of dry aniline upon ethyl bromide, he obtains the so-called imidogen compound predicted by Liebig, and the proof of the substitutability of ammonia hydrogen atoms is made. The substance obtained was the hydrobromate of ethyl-phenyl-amine. Next he substitutes the remaining hydrogen atom of ammonia by producing di-ethyl-phenyl-amine. Hofmann then finally succeeded in adding to this tri-substituted ammonia a molecule of ethyl iodide, and he obtained phenyl triethylammonium iodide, which was quite different from the di- and tri-substitution products. It was metallic in nature and acted like ammonium iodide. On treating it with moist silver oxide he obtained phenyl-triethylammonium hydroxide in crystals, which deliquesced and gave as decomposition products H_2O , C_2H_4 and $\text{C}_6\text{H}_5(\text{C}_2\text{H}_5)_2\text{N}$. It was basic and caustic, destroying tissue and vegetable colors as readily as caustic potash, and bitter as quinine. Würtz, in 1849, proved the same thing that Hofmann did, but from a different point of view. He made the methyl and ethyl esters of cyanic and cyanuric acids and heated these with water, which yielded him the alkyl-ureas, *i. e.*,

diethyl- and dimethylurea, just as Wöhler had previously obtained urea from cyanic acid. When he then treated these alkyl-ureas or simply the cyanic esters themselves with caustic potash, he obtained the substituted ammonias themselves as strong alkaline limpid liquids :



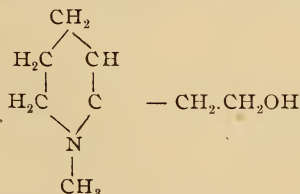
This, then, proved conclusively the nature of the substituted ammonias, and that, in all probability, all alkaloids were ammonia in which one or more of the hydrogen atoms had been replaced by oxygenated or non-oxygenated radicals. The next step in the development of the constitution of the alkaloids was the result of Gerhardt's distillation of quinine, cinchonine and strychnine with caustic potash, whereby he obtained quinoline, and of Anderson's study of the so-called Dippel's oil, an oil obtained from the destructive distillation of animal matter, and also called "Oleum animale Dippelii," which yielded him pyridine, picoline, lutidine and other volatile basic oils, and of bone oil, which yielded the same products. Some chemists now held that possibly alkaloids were not at all derivatives of ammonia, but might be derivatives of some of these newly discovered volatile bases, pyridine, quinoline, etc. It was not until 1867 that these bases were more definitely studied, and the fact established that they were not substituted ammonias, but nitrogenous hydrocarbons, *i. e.*, fundamental substances which could yield innumerable derivatives just as did benzene, anthracene, naphthalene, etc. In 1869 the next step was made by Körner, when he showed that just as naphthalene is made up of two benzene nuclei, so is quinoline made up of a pyridine and a benzene nucleus, *i. e.*, benzene : naphthalene as pyridine : quinoline. Ladenburg, in 1883, proved the correctness of the view by actually converting pyridine into benzene. In 1869 the first "apo" alkaloids were made, *i. e.*, alkaloids obtained from other alkaloids by the abstraction of one molecule of water; thus apomorphine and apocodeine are merely

morphine and codeine minus a molecule of water in each case. Chemists now undertook to decompose alkaloids and obtain decomposition products from them, and from these determine what are the constituent parts that make up the molecule, and, as a final stage, what is the hydrocarbon of which they are derivatives? Thus in 1871, Kraut, in distilling piperine-trichloracetate with silver oxide, noticed that pyridine was eliminated, and at once supposed it was a derivative of pyridine. Later, Hofmann, in 1879, transformed piperidine into dibrom oxy-pyridine by heating it to 220° with bromine and water. Next, Königs succeeded in converting piperidine into pyridine by oxidizing it and removing six hydrogen atoms. This made it appear to be a hexa-hydro-pyridine derivative. He next tried the reverse process, and by reducing pyridine in alcoholic solution with sodium converted it directly into piperidine. This proved that piperidine is hexahydro-pyridine, and we know its constitution. Synthesis now came to the aid of chemists to help unravel the constitution of these complex alkaloids, and, in case of piperine, it was Ladenburg who, in 1885, treated dicyan-trimethylene with sodium in alcoholic solution and obtained, as expected, pentamethylene diamine. On rapidly distilling the latter it is decomposed into free ammonia and piperidine identical with the natural product. What first, however, put confidence in this work of determining alkaloidal constitution was the brilliant work of Ladenburg on atropine, not only because it showed how beautifully the constitution of these substances could be unravelled, but also because it was a generally used substance and the actual identity, both chemically and physiologically, could readily be determined. If atropine could successfully be made synthetically, why could not any alkaloid? Atropine was isolated in 1833 by Geiger and Hesse, and its formula $C_{17}H_{23}NO_3$ was established by analysis by Liebig. It is lævogyre, bitter and powerfully dilates the pupil. Kraut and Lossen, in 1863, showed that atropine was an ester, as barium hydrate will split it up at 60° into tropine and tropic acid: .



If the reaction is prolonged decomposition proceeds further, and the tropic acid is converted into atropic acid $C_9H_8O_2$ by loss of H_2O , and if the temperature should rise to 180° C. the tropine will also lose a molecule of water and be converted into tropidine $C_8H_{13}N$.

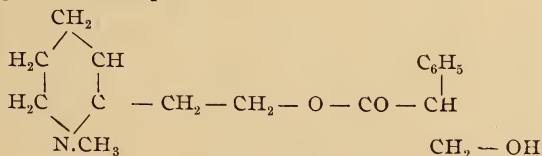
In 1879 Ladenburg heated on a water-bath the salt tropine tropate with dilute hydrochloric acid, and thus artificially produced the opposite reaction to that just given, and the result was the elimination of a molecule of water, and the formation of atropine, which possessed all the physical and physiological properties of the natural alkaloid. Faith in synthesis was established. For establishing this faith Ladenburg has this year, as we have just heard, been decorated by the British Society with the Hanbury Medal, the highest gift pharmacy can bestow upon scientific sages. By varying the acid, Ladenburg made a whole line of so-called tropeines, *i. e.*, he used valerianic, acetic, butyric, salicylic, benzoic, etc., acids and obtained valeryl-tropeine, acetyl-tropeine, etc. Some of these were also found to possess mydriatic properties. The constitution of tropine was worked out by Ladenburg and Merling, and found to be as follows:



i. e., a tri-hydro-pyridyl-ethyl alcohol or derivative of pyridine. The constitution of tropic acid has also been determined by the same author and found to be



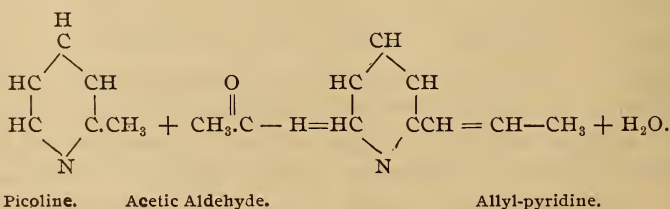
and this has been confirmed by synthesis. This gives us the constitution complete of atropine:



To have traced all the steps by which these authors found the constitution of tropine and tropic acid would have taken too much time, and I do not think it would have been interesting to all of you. While all three of the belladonna alkaloids have mydriatic properties, they are all different chemically. Atropine melts at 115.5°, and hyoscyamine, its isomer, at 108.5°, but up to to-day the difference in chemical constitution between the two is unknown, as hyoscyamine changes into atropine even when it is melted. They are probably stereo-isomers.

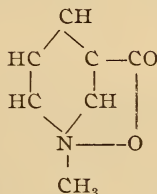
Hyoscyne, which is identical with scopolamine, however, is different from the other two, atropine and hyoscyamine, as it melts at 59° , and when split up analogously to atropine, yields scopoline and tropic acid, while atropine, as we saw, yields tropine and tropic acid. That scopoline is different from tropine their melting points show, tropine melting at 62° and scopoline at 110° .

The first alkaloid made synthetically was, however, coniine, because it is such a simple derivative of pyridine, being α -propyl-piperidine, *i. e.*, α -propyl-hexahydropyridine. This synthesis was also made by Ladenburg in 1885. Before this synthesis, however, the constitution of the alkaloid had been definitely established by Hofmann in 1884. On heating some coniine with some zinc dust, he observed a great evolution of hydrogen, and obtained as a residue the alkaloid conyryne— $C_8H_{17}N = C_8H_{11}N + 6H$. This indicated that it was a pyridine derivative, and Hofmann confirmed this by oxidizing conyryne when he obtained picolinic acid—a monocarbonic acid of pyridine then fully known. The difference in composition by atoms left only the possibility of the side chain being propyl or isopropyl. But isopropyl-pyridine had been made synthetically by Ladenburg, and was not identical with conyryne, hence conyryne is by exclusion propyl-pyridine. Hofmann confirmed this also by reducing coniine by hydriodic acid when he obtained normal octane, which would have been impossible if the coniine had contained an isopropyl group. As coniine was shown to yield conyryne and six hydrogen atoms by reduction with zinc dust, it follows that coniine is propyl-hexahydro-pyridine, *i. e.*, propyl-piperidine. Ladenburg tried to make the synthesis of coniine by heating pyridine with propyl iodide. By this heating the propyl group is changed to the isopropyl group, and he actually obtained isopropyl-piperidine. He then started from a different source by heating picoline, *i. e.*, α -methylpyridine with acetic aldehyde, which yielded him, as expected, allyl-pyridine :



Upon merely reducing this allyl-pyridine eight hydrogen atoms were added, and the result was coniine. It was an ingenious idea, very simple, but very ably executed.

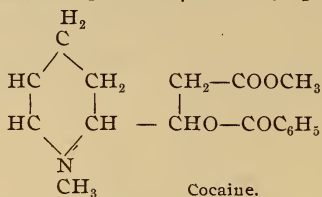
The next alkaloid to be made synthetically was trigonelline, the alkaloid of *Trigonella fœnum-græcum*, commonly called fœnugreek seed. It was first obtained by Jahns, in 1885, and in the succeeding year he determined its constitution, finding that it was the methyl betaine of nicotinic acid; a betaine being an inner anhydride of an acid and an alkaline group.



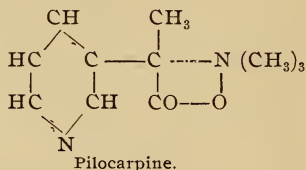
This he was enabled to do as the result of the studies Hantzsch was just at the time making of the betaines of pyridine carbonic acids, and in particular made them of both nicotinic and picolinic acids. Both were of course isomeric with one another, and both were isomeric with trigonelline, but Hantzsch failed to discover by a comparison that the latter was identical with one of them. Jahns was just working on trigonelline, and on comparing it with both of them, found that it was identical with that of nicotinic acid, which is β -pyridine carbonic acid.

The great step in the advancement of alkaloidal constitution was the complete and thorough study made in the eighties of pyridine and quinoline and their derivatives. By obtaining nearly all the derivatives of these two substances investigators were able, in studying and breaking down alkaloids by oxidation or reduction, to gain a definite foothold, so to speak, and grasp something that they knew the composition of, and would aid them in their further work and conclusions. The great development of synthetic methods also helped along this work and especially served to confirm work that had been more or less problematical before. Among the opium alkaloids, those that were known constitutionally at about this period, in 1886, are narcotine and papaverine, the former being a very complex pyridine and the latter a quinoline derivative, the former being the combined work of Matthiessen, Wegscheider and Roser

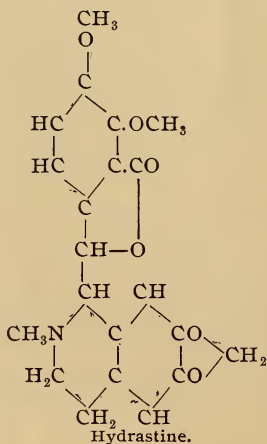
and the latter of Goldschmidt. Cocaine was isolated by Niemann, in 1860, and its formula determined by Lossen, but Einhorn first, in 1888, determined that it was an ester, *i. e.*, methyl-benzoyl ecgonine, and further determined that ecgonine was methyl-tetrahydro-pyridyl- β -oxypropionic acid, and that hence cocaine is the methyl ester of methyl-tetrahydro-pyridyl- β -benzoyl-propionic acid.



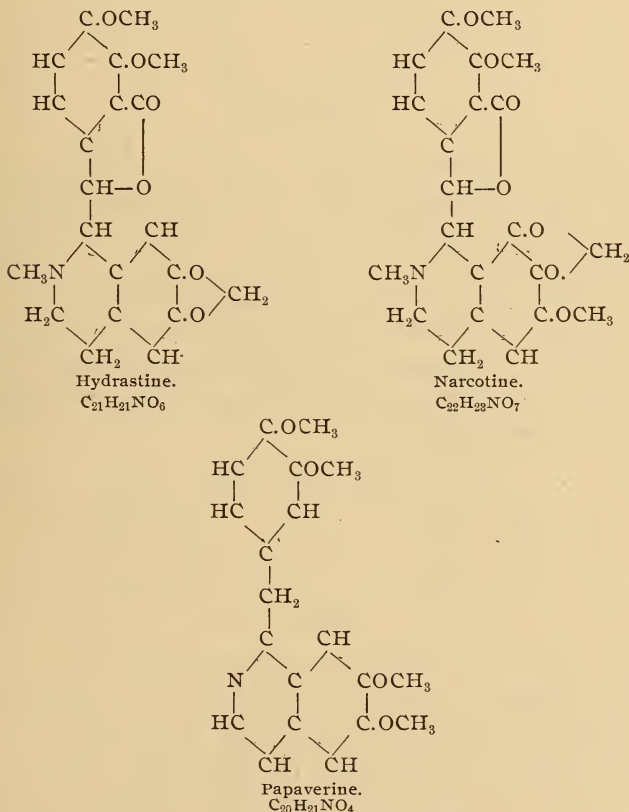
At about this time also pilocarpine was being studied by Hardy, in Paris, he also first having isolated the alkaloid in 1874, and he worked out the constitution, and then made a successful synthesis of the same. He found it was Betain or inner salt of β -pyridine lactic acid.



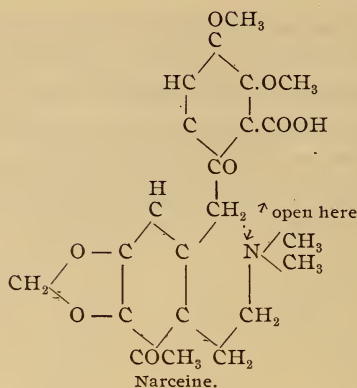
In 1890 the constitution of hydrastine was worked out by Freund and Phillips, who were aided in their work by the fact that Roser had not long previously worked out the constitution of the very similar alkaloid narcotine. This is an iso-quinoline derivative.



It is very interesting to observe the very close similarity between the three alkaloids, narcotine, papaverine and hydrastine, constitutionally speaking, and I imagine that a closer comparative pharmacological study of these three in connection with one another would prove of interest, for it certainly seems more than likely that three substances that are so closely allied, atomically speaking, should possess very similar physiological properties :

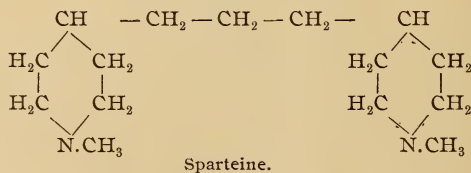


According to Freund, narceine, another opium alkaloid $C_{23}H_{27}NO_8$, is closely related to narcotine chemically, and all his results and work, covering a period of a year or more, point to the fact that it is not an isoquinoline derivative, but that the nitrogen is part of an open chain. This would account for its unusually weak alkaline reaction, for its salts are not stable, and its alkalinity is very unpronounced.



As might be expected, caustic alkalis will split up narceine, causing it to lose its nitrogen atom as trimethylamine and forming an acid Freund named narceonic acid. The same investigator has also in the past two years worked upon still another opium alkaloid, thebaine, and has practically determined its constitution.

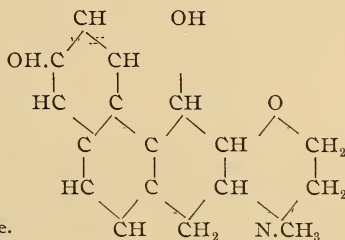
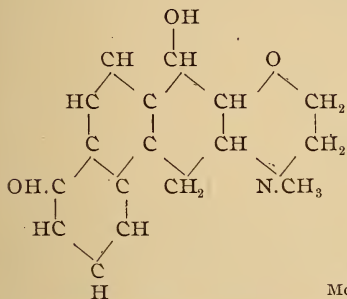
The alkaloid sparteine $C_{15}H_{26}N_2$, isolated in 1851 by Stenhouse from *Spartium Scoparium*, is at present being studied by Ahrens, and he feels reasonably sure that the composition of its tetrahydro derivative is represented by



and that it is hence a derivative of dipicolylmethane.

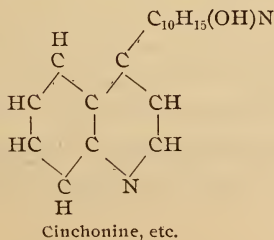
Many investigators since Sertürner's day have worked on the constitution of morphine. Prior to 1889, Von Gerichten, Schrötter and Otto Fischer had advanced our knowledge very much, but it was not until the discoverer of antipyrine (Knorr) published his first papers on the subject that definite knowledge could be said to have been established. The number of derivatives of morphine that have seen the light of day during these twenty years runs up into the hundreds, and the end is not yet. When the day comes that Von Gerichten and Knorr can agree to the arbitration of their respective cases, the accumulation of morpholines, morphomethines, etc., will probably cease, but not until then. Pending this day, the

formula of Knorr is usually accepted as very near the truth, and as such we will accept it. It is a morpholine derivative of the hydrocarbon phenanthrene, and the questions remaining open are at which of two of the three benzene rings of phenanthrene the morpholine ring is attached, and (2) exactly where the two hydroxyls are located. I will give you both, and you can have your choice:

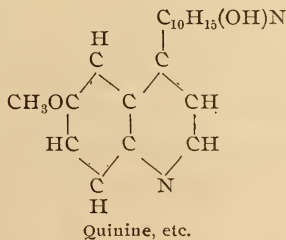


Morphine.

There can be no doubt that this question of final doubt will ere long be settled. What was said of morphine is equally true of quinine, for one investigator of the constitution of this alkaloid alone, Königs, could fill a good-sized quarto volume with his own work. The question is, however, further removed from solution than in case of morphine, for in case of quinine there is an entire group, C₁₀H₁₅(OH)N, that is more or less a mystery. On the face of it, it appears like a quinoline group, but it has been settled that it is not, but rather a pyridine group, and tetra-hydrated at that, and somewhat similar to tropine and ecgonine. The fact that cincholoiponic acid, an oxidation product of cinchonine, is both isomeric with tropic acid and of very similar constitution, indicates this very strongly. At any rate, we know that quinine, quinidine and quinicine are identical constitutionally, but are stereochemic isomers, and the same is true of cinchonine, cinchonidine and cinchonicine. The difference between the two groups is one methoxyl group, OCH₃, as the formulas below indicate:

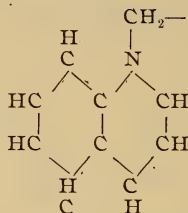


Cinchonine, etc.

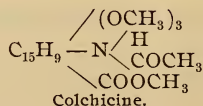


Quinine, etc.

Of strychnine we know that it is a quinoline derivative, as Gerhardt, way back in the forties, obtained quinoline from it. While many have worked upon strychnine, the main work that bears upon its constitution has been done by Tafel. This work has shown that it is a derivative of a nucleus of formula



which has been called strychnoline, and this substance does not possess the characteristic properties of strychnine, while, when oxidized and an oxygen atom replaces the two hydrogen atoms of the CH_2 group, it assumes the poisonous and cramp-producing properties of strychnine. Just how the remaining part of the strychnine molecule is made up is at present unknown. Colchicine has been studied by Zeisel for some years and he has ascertained that colchicine is the methylester of colchiceine and that the latter contains a carboxyl group COOH . He has made numerous derivatives of colchicine and has established that it is not a pyridine or a quinoline derivative, but that the nitrogen is in all probability present in the form of an acetylated amido group. An atomic group C_{15}H_9 is as yet undetermined in case of this alkaloid and, as far as known, the constitution is supposed by Zeisel to be



I have now brought the constitution of the alkaloids up to date, and we have observed that at the present day more work is being done on their constitution than ever before, and that there appears to be ample scientific interest attaching to the work to justify me in predicting that before twenty more years have passed by the constitution of every alkaloid will be known definitely. To those that have the question on the tips of their tongues, of what advantage to pharmacy is all this structural work, I will answer that it is

of manifest advantage to both pharmacy and chemistry. To chemistry because it marks in each case, as a fact established, a milestone for the guidance of subsequent workers, and chronicles the existence of another truth; to pharmacy, because its advent means another step toward possibly improved medicaments, not to mention possibly greatly cheapened drugs. When morphine, for instance, shall be constitutionally known, its synthesis from phenanthrene is within the range of probability, and with this comes the ultimate reduction of its price to that of quinine, or, perhaps, less. To pharmacology it means a step in case of each alkaloid toward the attainment of ideal medication, *i. e.*, medication with one specific effect and not with accompanying side effects. Just as these side chains affect chemical properties so they undoubtedly affect physiological properties, and if morphine, for instance, is a narcotic and an anesthetic, and, perhaps, has certain deleterious influences on the brain centres, the lining of the stomach, kidneys, etc., that we may call bad side effects, and that are unfavorable to the use of the drug, there is a possibility opened to view of so removing some of these chains or groups and adding others as to make of morphine an anesthetic without any narcotic effects or without those brain and stomach effects that now render it the curse of many a family. That this is possible, nay, more, that it will be the natural development of medicine and pharmacology in the next century, I am prepared to positively assert. It will come as sure as the sun rises in the east and sets in the west, for the whole trend of advanced medical thought is in that direction, and when it does come it will come as the result of just such study as I have been endeavoring, I hope with some measure of success, to lay before you this evening.

ALGÆ AS A CAUSE OF THE CONTAMINATION OF DRINKING WATER.

BY G. T. MOORE.

The widespread interest which has been aroused throughout the country within the last ten years with regard to the securing of sanitary water supplies is evidence of the importance of the problem, and no effort is now considered too great or too costly that will insure to the public a constantly pure and wholesome flow of this most necessary article.

The question is one which naturally appeals to the engineer, and for a long time it was left entirely to him to determine not only how the water was to be obtained and supplied, but also its quality. Too often the quality was a matter that was given little or no consideration, and topographical or financial consideration decided in favor of a supply that afterwards proved to be unfit for use, if not absolutely dangerous. Later, the chemist was called in, and, while people now knew just the amount of mineral and organic matter contained in the water and deductions could be made showing that this matter probably came from certain sources, there was still no getting at the actual cause of a great deal that contaminated water supplies until recourse was had to the microscope. It is quite as necessary to determine the origin and condition of organic matter found in water as to know the exact quantity and quality of it, and in many cases the true interpretation of a chemical analysis depends entirely upon a direct biological examination.

The history of the microscopical study of water in connection with its wholesomeness is one which extends over a comparatively short time and, until quite recently, there have been scarcely any who gave their whole attention to this aspect of the subject. It is, however, fast becoming recognized as most important and necessary, and the public are coming to demand that the water they use be subjected to biological examination as well as chemical analysis.

It will, perhaps, be profitable to consider a few special forms which give rise to disturbances in water supplies, and to point out some of the reasons for these organisms causing pollution and unwholesomeness.

We shall confine ourselves to a group of plants known as the algæ, which, aside from the bacteria, produce more trouble than any other members of the vegetable kingdom. The bacteria are recognized as being responsible for much disease and discomfort, although the actual number which prevent the same is vastly in the majority. This group and certain animals of a low order which contaminate water would each form the subject of an entire article, and for this reason, must be left out of consideration at this time.

The group of the algæ contains a number of forms which are wonderfully varied, both as to their size and method of growth; and, while the large red and brown "sea-weeds" belong to this class, it is the grass-green forms which are most often found in fresh water.

Certain of this latter kind can frequently be observed in quiet or stagnant pools, and are popularly termed "pond scum," "frog spawn," etc. It is not to these easily-discerned plants, however, to which we usually have to look for the cause of the pollution of most water; while they may cause considerable damage and trouble in a mechanical way, and it is generally the desire of the engineer to keep them out of his reservoir, they are probably a benefit rather than a detriment so long as they are in active, healthy condition. It has been found that volatile, fatty acids, such as butyric and valerianic, together with glucose, leucin, tyrosin and even urea, when properly diluted, can be assimilated by such plants, and no doubt a considerable number of organic substances which are carried into rivers by drains are destroyed by the larger green algæ and diatoms. It must be remembered, however, that a good share of this work is accomplished by the so-called "water bacteria," which are everywhere present.

The group of plants which is, perhaps, best known as polluting drinking water is the one containing the forms popularly called the "blue-green algæ." Whether, in the technical sense, they really are algæ is, perhaps, a question, as they are much simpler in structure than the true algæ, and show a great resemblance to the bacteria, both vegetatively and in their methods of reproduction. This is so evident that the blue-green forms have been put with the bacteria into a separate group known as the SCHIZOPHYTA, and termed *Schizophyceæ*, while the name *Schizomycetes* has been applied to the bacteria. As the common name denotes, these plants are usually of a bluish-green color, but this is not universally true, for they may assume various shades of olive, yellow and brown, even appearing chocolate or purplish-red at times. The blue-green shades are brought about mostly by various mixtures of "leaf-green," or chlorophyll, with a substance of a nitrogenous or proteid nature, known as phycocyanin. Sometimes there is a coloring matter in the gelatinous sheath of the plant called scytonemin, which is responsible for the reddish, violet and brown shades, but in addition to this it seems possible that a few forms contain numerous gas vacuoles, which line the inner walls of the cells, producing an optical effect which makes them appear red or chocolate. This is probably the cause of the color of *Trichodesmium erythræum*, which gives the name to the Red Sea, and of certain oscillatorias in this country which cause ponds and pools to become a deep chocolate brown.

Structurally, the Schizophyceæ are very simple indeed. Many of them consist of but a single cell, and multiply by merely dividing and giving rise to two cells like the parent. Others are composed of a series or chain of cells which are held together by a gelatinous envelope, or there may be direct protoplasmic communication between the cells. The contents, however, vary but little with the external appearance of the forms. While the cells are filled with protoplasm and have the usual granules, vacuoles, etc., it is extremely doubtful whether or not there is a true nucleus. The coloring matter, instead of being confined to definite bodies, as in the true algæ, is distributed throughout the cell contents or forms a sheath lining the wall of the cell.

In addition to the simple method of division, certain groups of the Schizophyceæ have the power of forming thick-walled spores, and it is by means of these cells that they are able to tide themselves over adverse conditions which it would be impossible for their vegetative cells to withstand. Thus it is that a form which has once existed in a pond or stream may disappear for several years, and then suddenly make its appearance, because the spores made by the plants in the first place, having remained in the mud at the bottom, reach maturity, and the combination of temperature, nutrition, etc., are favorable for germination. The conditions most favorable for the rapid increase of the blue-green forms are shallow, stagnant water and relatively high temperature. Consequently it is during the summer months that the most trouble and annoyance is experienced from these forms. The well-known "pig-pen" and "grassy" odors are given off and water supplies rendered quite unfit for use by the unpleasant odor and taste. Jackson and Ellms have shown that these odors are due to the breaking down of highly organized compounds of sulphur and phosphorus, and to the unusually large amount of nitrogen which these plants contain.

As usually classified by botanists, the Schizophyceæ are divided into two groups, the Coccogoneæ and Hormogoneæ, according to whether the plant consists of a single cell or a number of cells. The Hormogoneæ are further distinguished by the power they possess of breaking their filaments up into smaller groups of cells called hormogonia, which may divide rapidly and give rise to new plants. The only genera among the unicellular group which are likely to cause trouble are *Cælosphærium* and *Clathrocystis*. These are quite

similar in general appearance, consisting of a gelatinous mass in which are embedded bluish-green cells of either spherical or oblong shape. There is no connection between the cells, and the colonies are capable of being broken up into smaller groups, each cell of which divides rapidly, and thus new masses are formed. In *Clathrocystis* the colony sends out buds or projections which soon fall off, and these grow into new colonies like the original one. Among the Hormogoneæ there are quite a number of genera which have been reported to be the cause of various odors and tastes in drinking water. The members of the nostoc tribe are particularly obnoxious, and, since all can produce thick-walled spores in addition to their vegetative method of propagation, it is often a most difficult matter, after they once make their appearance, to get rid of them.

The following key will give some idea of the various forms of Schizophyceæ which have been found to contaminate the water in which they occur, and will bring out the morphological points which are depended upon for their determination.

SCHIZOPHYCEÆ.

- (A) Plants consisting of a single cell, occasionally united into colonies by being embedded in a gelatinous matrix.—I. Coccogoneæ.
 - (B) Plants always of more than one cell, forming simple or branched filaments, which may or may not be enclosed in an outer gelatinous layer or sheath.—II. Hormogoneæ.
 - (I) Coccogoneæ.
 - (1) Cells free or only slightly held together, not forming a definite colony.—*Chroococcus*.
 - (2) Cells held together in a gelatinous matrix and forming colonies of regular outline.
 - (a) Colonies at first solid, several rows of cells thick, becoming saccate and perforated.—*Clathrocystis*.
 - (b) Colonies hollow, cells only on outer surface.—*Cælosphærium*.
 - (II) Hormogoneæ.
 - (1) Cells generally differentiated into three kinds: (1) vegetative cells; (2) spores, and (3) heterocysts. The latter usually being of different color, clearer contents, and

with thickenings in the walls adjoining the vegetative cells or spores.—(a) Heterocystæ.

(2) Cells in each filament undifferentiated. No heterocysts.—

(b) Homocystæ.

(a) Heterocystæ.

† Filaments irregularly interwoven and contorted, enclosed in a definite gelatinous mass.—*Nostoc*.

†† Filaments free or but slightly united.

φ Heterocysts and spores intercalary.

* Filaments free or united in a formless mass—*Anabaena*.

** Filaments densely agglutinated in fascicles often of considerable size.—*Aphanizomenon*.

φφ Heterocysts and terminal spores contiguous.—*Cylindrospermum*.

(b) Homocystæ.

† Filaments simple, with an evident sheath.—*Lyngbya*.

†† Filaments simple, sheath wanting or very slight, plants possessing a characteristic movement.—*Oscillatoria*.

Another great group of plants which of late years has been shown to be of importance in the consideration of the biology of drinking water is that known as the Diatomaceæ. By some botanists these forms are believed to be closely related to the Desmids, an order of the grass-green algæ, which seems to resemble them in certain points of morphology and reproduction. On the other hand, there are those who maintain that the diatoms are a special class, being much older than the desmids, and that the points of resemblance are only analogous, not homologous, it therefore being impossible to regard them as proofs of genetic relationship. Whatever their affinity with other algæ may be, they certainly constitute the largest group of any of the aquatic plants, there having been more species of diatoms described than all of the red, brown and green algæ taken together. It is probable that a great many of these species are not good, but even after making full allowance for such duplication there still remains an enormous number of separate and distinct forms.

In structure, a diatom is not unlike a minute glass box, for it is made up of two halves, one fitting tightly within the other, and having its walls strongly silicified. It is this silica which makes the diatomaceous earth valuable for polishing powders. In at least one article on the market diatom shells form a considerable part of a tooth powder, and the bad effect of such hard material on the teeth is so obvious that it would be well for every one to have a microscopical examination made of any powder to be used in this way. Earth containing the remnants of diatoms is also used extensively in the manufacture of dynamite, and the living marine forms constitute a valuable part of the food of some fishes.

These plants have a peculiar method of vegetative multiplication which is unlike anything found elsewhere among the algæ. The two halves of the "box," which are called valves, begin to separate slightly from each other, and as the contents divides into two parts, there is formed within two new halves, one fitting into the larger half of the original cell, and the other forming a new box with the smaller half of the parent plant. These then separate, and thus there are formed two diatoms of exactly the same construction as the mother cell, although one is a trifle smaller than the other. In addition to this method of propagating the species, there are various ways by which the plant forms a single large resting spore; and recently it has been discovered (chiefly through the work of Castrocane and Murray) that it is probable that the whole contents of a diatom cell may break up into a number of small spores, each one of which develops into a new plant.

There are only a few species which are known to give rise to serious trouble in water supplies, but these occur quite frequently and in great quantities. Usually the infected water has an aromatic odor, variously described as resembling fish or geraniums, and the taste is disagreeable enough to render it quite unfit for use. In addition to this effect, however, diatoms are extremely troublesome when contained in water to be used for the manufacture of paper or for laundry purposes, because of the greenish-brown coloring matter they contain, and which stains articles coming in contact with it. Whipple has observed that the growth of diatoms seems to depend upon certain definite conditions of the water; that is, they do not develop when the bottom of the pond or reservoir is quiet, but in spring and fall, when the rising or lowering temperature

causes the water to circulate and a good supply of air and nitrates is obtained, the growth is most luxuriant. Thus it is seen that temperature is only an indirect cause, and not one that need be taken into account by itself.

The class Syngeneticæ comprises a number of organisms which until recently have been considered animals. Some of them are certainly plants according to present-day standards, and others are so near the line separating the two kingdoms, that botanists are beginning to study these forms quite as much as zoölogists. There is a single member of this class which probably causes more trouble in water supplies than any other organism, either plant or animal.

This form, known as *Uroglena*, is frequently found in New England, and has been reported as far west as Indiana. The probabilities are that it is widely distributed in this country, but has not yet been recognized in many localities. In appearance *Uroglena* resembles a colorless sphere with numerous small greenish cells embedded in its periphery. The whole colony may become almost a half millimetre in diameter, although it is usually much smaller. The individual cells are each provided with a pair of cilia of unequal length, and it is by the vibration of these that the whole colony is revolved through the water. Each cell of the colony contains a nucleus, a red spot and a single greenish color body, besides several vacuoles. In addition, there is a considerable number of oil-globules, and it is the liberation of this oil which causes the fishy, oily taste and odor produced by *Uroglena*. Among the algæ and Schizophycæ the contamination is nearly always brought about by decay, but in this case the trouble is produced simply through the mechanical breaking up of the organism and the consequent liberation of the oil contained within the cells. Usually the pumping or gravity necessary to distribute the water is sufficient to free the oil, for the cells are very fragile. In one instance, where the water was used almost continuously for several days for washing caterpillars off the trees, a marked increase in the disagreeable odor and taste was the result. The exact nature of this oil is not very well understood. Calkins, who isolated and concentrated it, believed it to be similar to the essential oils. It was non-volatile at the temperature of boiling water, and seemed to resemble the oils obtained from diatoms and the blue-green forms.

No sexual method of reproduction has as yet been observed

in *Uroglena*, but it has a rather peculiar method of cell division which enables it to multiply rapidly. Before a cell divides it turns in the periphery of the hollow gelatinous sphere, until it is in a position at right angles to the one usually occupied. Then at the end of the cell which originally pointed towards the centre of the sphere there are formed a pair of cilia like those at the opposite pole, and a red spot appears. The cell then begins to be sharply constricted, and as it gradually divides the two halves are drawn back through an angle of 45° , so that when the new cells are finally formed they occupy a position similar to the one normally held by the mother cell. When a colony becomes too large it breaks up into individual cells, and these soon, by repeated division, grow into new spheres. In addition to this way of multiplying, resting spores are formed, which enables the organism to survive conditions which would otherwise exterminate it. In this country, *Uroglena* seems to thrive best in cold temperatures, it usually occurring in greatest numbers when the water is frozen over. Just the reverse is true in Europe, where it is most abundant during July and August, and disappearing entirely at the approach of cold weather. For a number of reasons it seems probable that the European form is quite a different species from the one which causes so much trouble in America.

There are others of the Syngeneticæ which contaminate water, although not to the extent that *Uroglena* does. *Synura* and *Syn-crypta* are both known to have a bad effect, *Synura* being responsible for the "ripe cucumber" odor which was formerly thought to be caused by fresh-water sponges. It is probable that these two forms are really the same thing, and Dr. Kirchner, in a note to Hansgirg, has said that he united the two under *Synura*, as he did not consider that a true generic difference existed between them. The somewhat uncertain genus *Uvella* should perhaps be mentioned here. This form, which greatly resembles *Synura*, has been reported as being one to be most dreaded, causing an exceedingly disagreeable taste that was almost acid. Whether this organism really has this effect has been questioned, but it ought to be watched for and further investigations made.

Enough plants have been referred to to make it evident that in dealing with such a variety of forms having such varied methods of growth and reproduction, it would be quite impossible to have any

single remedy that would prevent or remove all the unpleasant effects caused by these organisms. Each form must be studied by itself, and it is only after all the information possible has been obtained with regard to its life history and conditions necessary for growth that we can hope to prevent or exterminate it. Large quantities of statistics are available, showing the kind and extent of the organisms most likely to occur in water supplies, and we have some little information with regard to the climatic conditions which are most conducive to their rapid growth; but there is still wanting a great many details which can only be obtained from patiently cultivating these plants in the laboratory. On the other hand, certain general precautions can be taken, such as removing the top soil in making new reservoirs and storing ground water in the dark, which undoubtedly prevents the introduction and growth of many of the most troublesome forms, and wherever it has been possible to apply these methods the result has justified the expense. It is certain that it is just as necessary to have a thorough microscopical examination of a water supply as it is to have a chemical analysis, and usually the most practical application of the knowledge thus obtained can be made. In some cases, where the cause of pollution has been shown to be due to some plant living in the water, it has been possible to cut out that part of the supply until after the cause has disappeared. Again, the immediate detection of obnoxious forms often permits of their removal before decay and pollution take place. As soon as people understand that something more than a mere analysis by a chemist or an inoculation of guinea-pigs is necessary before the purity of a water supply can be ascertained, there will be a greater demand for those who can make accurate microscopical examinations, and we may hope for an increase in our knowledge of this most important aspect of a most important subject.

Direct references to the literature were impracticable throughout the foregoing, but a short bibliography is appended for the benefit of those who may wish to get more specific knowledge of the points referred to.

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A NOTE ON THE ASSAY OF OPIUM.

BY WILLIAM R. LAMAR.

Recently the writer, while engaged in assaying a sample of powdered opium, according to the U.S.P. method, noticed, after having exhausted the opium and concentrated these aqueous liquids to 14 grammes; and after its transference to a tared Erlenmeyer flask, the weight then brought up to 20 grammes, with the rinsings of the capsule, had been accomplished, that the addition of the prescribed 10 grammes of alcohol caused a very pronounced flocculent precipitate.

This precipitate, after the addition of 25 c.c. of ether, shaking actively, and allowing to stand for a few minutes, did not appreciably diminish.

At the time, it was considered quite likely that the solution of this deposited matter, upon the further addition of the ammonia water, might not be effected, and would therefore contaminate the precipitate, to be subsequently weighed as morphine.

This in reality seems to be the case, as shown by the weight of the crude morphine, and of the matter insoluble in lime water.

It was believed that by increasing the amount of the alcohol, all of this objectionable matter in solution could be gotten rid of prior to the precipitation of the morphine.

With this end in view, a series of experiments was instituted, which resulted in the confirmation of this view, as will be seen from the analytical data to follow.

As the result of his experiments, the writer, therefore, recommends the following modification of the U.S.P. process:

“Introduce the opium (which, if fresh, should be in very small pieces, and if dry, in very fine powder) into a bottle having a capacity of about 300 c.c., add 100 c.c. of water, cork it well, and agitate frequently during twelve hours.

“Then pour the whole as evenly as possible upon a wetted filter having a diameter of 12 centimetres, and, when the liquid has drained off, wash the residue with water, carefully dropped upon the edges of the filter and the contents, until 150 c.c. of filtrate are obtained.

“Then carefully transfer the moist opium back to the bottle by means of a spatula, add 50 c.c. of water, agitate thoroughly and repeatedly during fifteen minutes, and return the whole to the filter.

“When the liquid has drained off, wash the residue, as before, until the second filtrate measures 150 c.c., and finally collect about 20 c.c. more of a third filtrate.

“Evaporate in a tared capsule, first, the second filtrate to a small volume, then add the first filtrate, rinsing the vessel with the third filtrate, and continue the evaporation until the residue weighs 14 grammes.

“Rotate the concentrated solution about in the capsule until the rings of extract are redissolved, pour the liquid into a tared Erlenmeyer flask having a capacity of about 100 c.c. (here it will be best to employ a flask of about 150 c.c. capacity), and rinse the capsule with a few drops of water at a time, until the entire solution weighs 20 grammes.”

Add 60 grammes (73.2 c.c.) of alcohol, cork well, and shake actively for one minute, allow the flask and contents to stand for thirty minutes undisturbed, when the precipitated matter will have completely settled.

Now carefully decant the clear supernatant liquid into a tared capsule, transfer as much as possible of the precipitate to a filter of 7 centimetres diameter, previously moistened with a mixture of alcohol 3 parts, and water 1 part, by weight, allow the liquid to drain thoroughly, receiving the filtrate in the capsule containing the decanted portion, rinse the flask with small portions of the above alcohol-water mixture until freed from the precipitate, using 2 or 3 c.c. at a time, transferring these to the filter in such a manner as to wash the filter and its contents, and allow to drain before adding the subsequent rinsings.

Then continue the washing of the precipitate and filter, by care-

fully dropping upon the edges of the filter and contents, until the filtrate ceases to possess a bitter taste.

(The filtrate, although free from bitterness, will generally possess a faint straw-yellow color, due to the slight solubility of the precipitate in the washing mixture. This washing can generally be accomplished, by careful manipulation, with 15 c.c. of liquid; in no case, however, is it necessary for the total washings to exceed 25 c.c.)

Add 35 c.c. of water to the contents of the capsule, and having placed same on the water-bath, evaporate until the alcohol has been completely dissipated and the residue weighs 14 grammes, then proceed according to the U.S.P. method.

This additional step in the process can easily be executed in an hour's time, and certainly the purity of the morphine so obtained warrants its future employment.

It will be seen that a correction by any of the commonly used methods is entirely unnecessary.

The following table gives the results obtained by this modification, up to the present time, and the quantity and quality of the morphine obtained by a strict adherence to the U.S.P. method is appended for the sake of comparison.

The results here recorded represent the average of closely-agreeing duplicate assays.

The acid employed in the titrations of the different samples of morphine was a $\frac{N}{20}$ H_2SO_4 , which was standardized against sodium carbonate prepared from a specially purified $NaHCO_3$, methyl orange, litmus and phenolphthalein being used as indicators.

The mean of the above results, together with two determinations, according to the method of Weinig, was accepted as the standard.

This acid was employed in titrating crystallized morphine, prepared by precipitation of a saturated solution of its sulphate with a slight excess of potassium hydrate solution, washing until free from sulphates, and from potassium spectroscopically, carefully drying on porous plate, at a temperature of $40^\circ-50^\circ C.$, then well washing with ether and again drying to a constant weight at the above-mentioned temperature.

The following results were obtained:

0.220 gramme of morphine required 14.65 c.c. of $\frac{N}{20}$ H_2SO_4 , V.S.,

Number and Kind of Opium.	Percentage of Moisture at 100° C.	Time Allowed for Precipitation of Morphine.	Percentage of Crude Morphine Weighed.		Original Weight of Filters.
			On Filters.	Detached.	
1. Powdered,	6.23	16 hrs.	U.S.P. Process.	Modified Process.	U.S.P. Process.
2. Gum . . .	23.9	15 "	—	—	
3. " . . .	24.7	15 "	—	—	U.S.P. Process.
4. " . . .	22.8	15 "	—	—	
5. Powdered,	3.54	15 "	—	—	U.S.P. Process.
			U.S.P. Process.	Modified Process.	
			U.S.P. Process.	Modified Process.	U.S.P. Process.
			—	—	
			U.S.P. Process.	Modified Process.	U.S.P. Process.
			—	—	
			U.S.P. Process.	Modified Process.	U.S.P. Process.
			—	—	
			U.S.P. Process.	Modified Process.	U.S.P. Process.
			—	—	

1 Before correction was applied.

Number and Kind of Opium.	Percentage of Moisture at 100° C.	Time Allowed for Precipitation of Morphine.	Percentage of Crude Morphine Weighed		Original Weight of Filters.	Weight of Filters After the Detachment of Morphine.	Percentage of Pure Morphine in Opium as Indicated by Lime Water Test.	Percentage of Crude Morphine Insoluble in Lime Water.	Percentage of Pure Morphine in Opium According to Ash Method.	Percentage of Ash in Crude Morphine.	Percentage of Pure Morphine in Opium by Titration with Volumetric Acid.	Percentage of Pure Morphine in Crude Morphine by Titration with Volumetric Acid.	Percentage of Pure Morphine in Crude Morphine by Lime Water Test.	Percentage of Pure Morphine in Crude Morphine by Ash Method.
			On Filters	Detached.										
1. Powdered.	6.23	16 hrs.	13.52	U.S.P. Process	U.S.P. Process.	U.S.P. Process.	12.87	U.S.P. Process.	12.92	1.38	U.S.P. Process.	98.64	U.S.P. Process.	96.08
			12.81	Modified Process.	Modified Process.	Modified Process.	12.77	Modified Process.	12.92	0.15	Modified Process.	93.69	Modified Process.	99.92
2. Gum . . .	23.9	"	13.40	U.S.P. Process	U.S.P. Process.	U.S.P. Process.	3.92	U.S.P. Process.	12.73	11.85	U.S.P. Process.	99.14	U.S.P. Process.	96.47
			11.59	Modified Process	Modified Process.	Modified Process.	0.08	Modified Process.	11.21	0.77	Modified Process.	99.14	Modified Process.	99.31
3. " . . .	24.7	"	12.78	U.S.P. Process.	U.S.P. Process.	U.S.P. Process.	11.05	U.S.P. Process.	11.21	2.81	U.S.P. Process.	99.14	U.S.P. Process.	97.81
			11.29	Modified Process.	Modified Process.	Modified Process.	9.26	Modified Process.	11.21	0.00	Modified Process.	99.14	Modified Process.	99.31
4. " . . .	22.8	"	9.83	U.S.P. Process.	U.S.P. Process.	U.S.P. Process.	9.83	U.S.P. Process.	12.49	0.00	U.S.P. Process.	100.1	U.S.P. Process.	100.1
			12.55	Modified Process	Modified Process.	Modified Process.	12.58	Modified Process.	12.49	0.303	Modified Process.	100.1	Modified Process.	99.33
5. Powdered.	3.54	"	12.55	U.S.P. Process.	U.S.P. Process.	U.S.P. Process.	12.55	U.S.P. Process.	12.49	0.303	U.S.P. Process.	100.1	U.S.P. Process.	99.33

1 Before correction was applied.

2 After applying correction.

for neutralization = 99.76 per cent., each cubic centimetre of the acid, being the equivalent of 0.015117 gramme crystallized morphine.

0.3292 gramme of morphine required 21.7 c.c. of $\frac{N}{20}$ H_2SO_4 V.S., = 99.64 per cent.

The following mode of procedure was adopted in the titrations. Weigh into a tared beaker between 0.2–0.3 gramme of the morphine, and carefully run in upon it 25 c.c. of $\frac{N}{20}$ H_2SO_4 V.S., stir gently until solution is completely effected, which is quickly accomplished. Add 5 drops of the U.S.P. test solution of cochineal and then run in $\frac{N}{20}$ KOH, V.S., until a distinct pink color appears.

The morphine from Nos. 3 and 4 was destroyed before it was decided to titrate the different samples.

It will be seen from the accompanying table that trustworthy results cannot be secured by titration of the morphine as obtained by U.S.P. process.

This may be explained by the fact that there is present in the morphine an acid-consuming body of a lower molecular weight, at least such seems to be the case with No. 1.

0.3108 gramme of this sample, treated with 10 c.c. of water, transferred to a filter and carefully washed until the filtrate measured 36 c.c., required 1.55 c.c. of $\frac{N}{20}$ H_2SO_4 V.S.

As the solubility of crystallized morphine in water at 15° C. is given at one part in 4,350 parts (U.S.P.), and assuming that the water (36 c.c.) weighed 36 grammes, an amount of morphine (0.0082 gramme) should be in solution, corresponding to 0.55 c.c. $\frac{N}{20}$ H_2SO_4 instead of 1.55 as actually obtained.

Since the above observation was made and the work incidental to it had been completed, the writer's attention was drawn to the fact that a similar observation had been recorded by Mr. L. F. Kebler,¹ but no attempt was made to obviate this difficulty.

In conclusion, the writer wishes to say that a more extended trial will be given the method and the results reported upon in the near future.

LABORATORY OF SCHIEFFELIN & Co., New York.

¹ 1895. *Jour. Soc. Chem. Ind.*, 14, 464.

RECENT LITERATURE RELATING TO PHARMACY.

KANGAROO TENDONS.¹

Among the specimens recently received by the Philadelphia Commercial Museum are some kangaroo tendons sent by a surgeon in Australia. The tendons were taken from the tail of the kangaroo, and are preserved in preservative liquid. They are described as being aseptic and chromicized, and are intended for the use of surgeons in sewing up wounds. It is claimed that for this purpose they are superior to the silk threads commonly used. They are said to be strong and to permit of splitting lengthwise to any required fineness without any fraying. Among the specimens received are four thicknesses of tendon intended for as many different classes of wounds.

EUCALYPTUS KINOS.¹

Two samples of Eucalyptus kino from Australia were accompanied by the following note from the sender :

"*Eucalyptus rostrata* or red gum is very common throughout Australia. It is usually found along river courses and in marshy ground, attaining a height of 60 feet. The wood is used for upright posts and piles, as it is especially hard and durable, and withstands the action of water. It is our chief wood for street paving. The ruby-colored exudation or 'red gum,' Gummi rubrum, exudes from the bark, and has been miscalled Eucalyptus kino on account of its astringency. As first gathered it is not quite soluble, and has a certain amount of dirt, as per sample sent. This can be supplied at 3 shillings per pound. After treatment to make it quite soluble, as per sample sent, it can be supplied at 4 shillings 6 pence per pound. The soluble is listed in London at 7 shillings per pound. It is highly astringent and is used in diarrhœa, dysentery and relaxed conditions of the throat. It is better than kino, as it adheres better to mucous surfaces. It occurs in grains or small masses of a ruby or garnet-red color and transparent, has a rough astringent taste, and if chewed tinges the saliva red and sticks to the teeth. It is used as a lozenge, and with water and spirit as an astringent injection. It is used in suppositories, and, as tincture, it makes a good gargle. The fresh bark contains 7·8 per cent. of the kino or gum.

"Correctly speaking, 'kino' is the juice obtained from incisions in the trunk of *Pterocarpus marsupium*, evaporated to dryness."

¹ These notes were furnished us by William B. Marshall, Curator of the Philadelphia Museum.—EDITOR.

PICTET'S PROCESS FOR THE PURIFICATION OF CHLOROFORM.

By means of a double-walled cylinder, Pictet was able, with the aid of nitric oxide, to produce a temperature of -120° C. In this cylinder chloroform seemed to solidify at -63° C. He then built a larger container to hold 100 kilogrammes of chloroform, using a mixture of carbon dioxide and sulphurous acid, thus producing a temperature of -80° C., but the chloroform failed to crystallize. After some experiments, it was found that chloroform congealed at -83° C. instead of -63° C. In his first experiment, the thermometer showed -63° C., but the mass must have been at least -83° C. "The higher temperature was produced by waves from the outer circle passing through the liquid and striking the thermometer, thus producing the higher temperature."

It had been found that commercial chloroform contained as much as 30 per cent. of impurity, and consisted of some of the chlorides of carbon, but chiefly of a combination, CHCl_3 , possibly an isomer of chloroform. On exposing the 30 per cent. impurity to the rays of the sun, decomposition resulted in a few minutes. Recrystallized chloroform remained absolutely unchanged after several days' exposure to the sun.—1899, *Four. Soc. Chem. Ind.*, 18, 231.

L. F. KEBLER.

STERCULIA TOMENTOSA AND ITS GUM.

Under the name *M'beppe*, *Kougosita*, *Komikosita*, *M'boborg* and *Ici-ia-chixé*, the above-mentioned plant is well known in Central Africa, and its general characters—historical, botanical and commercial—are the subject of a recent elaborate essay by E. Heckel (*Repertoire de Pharm.*, 1899, 1). It is a tree about 10 metres high, with a gray and scarred bark, villous cordate-orbiculate to trilobate leaves, reddish pentamerous flowers and small (about 0.3 gramme each) seeds, which only contain oil and starch and are not used as are those from its congener *S. acuminata*. The sole native value of the plant arises from the gum exuded by the trunk, the yield of which is enhanced by artificial incisions. The gum resembles tragacanth, differing from it, however, in absence of starch and by forming with water a viscid liquid, rather than a jelly. Chemical examination shows it to consist largely of arabin. The gum is of interest from the standpoint of physiological botany, in that the yield is best from young and hardy plants.

H. V. ARNY.

EDITORIAL.

ENZYMIC AND SYMBIOTIC FERMENTATION.

While there have been a number of theories to explain fermentative changes, viz.: (1) The Acid Theory (of Pliny); (2) Contact Theory (Berzelius); (3) Mechanical or Physical Theory (Stahl); (4) Chemical Theory (Tromsdorff); (5) Galvanic Theory (Schweiger), and (6) Vital, Germ or Physiological Theory (Pasteur); it may be said that there have been but two views which have been to any great extent seriously considered in recent years, viz., the mechanical theory of which Liebig was the champion, and the vital theory of Pasteur, who discovered that fermentation is the result of the action of life without air ("*La fermentation est la conséquence de la vie sans air*"). It is a matter of common knowledge that the theory of Liebig was proven, by the results of the experiments of Pasteur, to be an error; and it may be said that these results at the same time illuminated the subject of the generation of life for the biological world and, furthermore, laid the foundation stones of the science of bacteriology.

Within the past few years the labors of E. Büchner have given rise to a new theory, known as the *enzyme theory* of fermentation. He has isolated an enzyme or ferment (zymase) from yeast with which alcoholic fermentation apparently can be produced. H. Abeles, however, took the position, a little more than a year ago, that the expressed juice from yeast plants with which Büchner worked really contained living fragments of the protoplasm of the yeast cell, and endeavored to explain the fermentative changes as due to this living plasma. In reply to Abeles, Büchner has shown rather conclusively in a number of experiments that the *plasma hypothesis* of the former is without foundation. More recently, A. Wroblewski, of Cracow, has made some studies on yeast juice by means of fractional coagulation, and he assumes that the enzyme is in that portion of the yeast which coagulates at 41°. J. Reynolds Green also confirms the researches of Büchner, and has shown that there is a ferment in the yeast cell which can be extracted and which will induce the alcoholic fermentation of sugar. These results of Büchner and others are extremely interesting, in that they disprove the two most important and commonly accepted points in the *Theorie der Gährung* (1879) of Nägeli. He distinguished the higher plants that produce distinctive ferment principles from the lower in which no such distinct principles had been discovered, and said of the latter "(1) that they had not yielded to any extracting medium anything that could effect fermentation in the absence of cells, and (2) that the products of their action are, 'without exception, less nutritious compounds,' and that they destroy the most nutritious substances. It was commonly accepted that, inasmuch as all of the important functions of the individual representing the unicellular plant were performed by the protoplasm of a single cell, the division of labor that can take place in a more differentiated structure is here impossible."¹ Krütsenberg, in some experiments (*Vergleichend-physiologische Vorträge*, Heidelberg), has apparently shown that "in the simplest forms the process of digestion is an intracellular one, not dependent on enzymes, but inherent in the protoplasm itself." While we cannot, in some instances at the present, deny the fermentative power of protoplasm, it has been shown by Büchner that in the so-called organized ferments unorganized fermentative principles are also present

¹ Greene, in *Annals of Botany*, 1893, p. 133.

which can be isolated, so that the zymase of yeast and the diastase of *Asperigillus oryzae* correspond to the diastase of barley or the emulsin in almond.

At the same time that the enzyme theory of fermentation is being developed an equally interesting phase of the fermentation question from the biological point of view is coming to light in what is known as symbiotic fermentation. It was Schwendener who, in 1869, first conclusively showed the peculiar relationship existing between the algæ and fungi in what constitute the group of plants known as Lichens. When certain algæ and certain fungi were brought together under proper conditions, this relationship was shown to be not one of parasitism, but one of mutual benefit, and termed symbiosis. Since that time a symbiotic relationship in a large number of plants, as well as animals, has been observed. A good case of symbiosis is observed in the nodules on the roots of leguminous plants which are filled with bacteria: These latter penetrate the root hairs and perform in the living cells of the higher plant functions, which are of decided benefit. In the green infusoria, hydra, sponges, etc., is observed a symbiotic relationship between the alga and animal.

The investigators of recent years have shown that in the alcoholic fermentation of starch at least two organisms are at work, each doing its share towards producing the final products. "Van Laer has called attention to the symbiotic co-existence of two yeasts in many beers, explaining certain peculiar after-fermentations as due to the action of yeast on the medium improved for it by the other. The Japanese have long been in the habit of brewing a peculiar fermented liquor known as rice-wine or saké. Rice grains are steamed, and when cool infected with a mould fungus now known as *Asperigillus oryzae*. When the rice is quite mouldy, at which time it emits a peculiar odor like pineapples, the starch is found to be turning rapidly into sugar, under the action of a diastatic enzyme secreted by the fungus. This decomposing rice is then placed in water and exposed to the action of a yeast, which rapidly ferments the sugar, and the alcoholic saké results. So closely is the yeast associated with the *Asperigillus* that, in practice, the alcoholic fermentation commences soon after the enzyme of the *Asperigillus* begins to hydrolyze the starch of the rice, and for some time a controversy existed as to whether the yeast was not really a part of the life history of the *Asperigillus*. Several observers have now shown, however, that we have here a striking case of symbiosis."¹ Similar cases of symbiosis are observed in the ginger-beer plant, only yeast and bacteria are here associated together, forming the clumps in the fermenting solutions.

A very complex system of symbiosis has been shown by the experiments of Omeliansky to be concerned in the circulation of nitrogen in nature. This author found that "if *Nitrosomonas*—the bacteria which oxidizes ammonia to nitric acid and *Nitrobacter*, the bacterium which further oxidizes nitrous to nitric acid—be sown together or separately on a medium containing organic nitrogen, no growth or change takes place. But if a bacterium capable of decomposing the organic nitrogenous medium, e. g., *Bacillus ramosus*, is added to the above-mentioned *Nitrosomonas* and *Nitrobacter*, the associated three organisms are able to carry out all the processes and complete the cycle of

¹ Ottokar Shieweck (*Centr. Bakt. Par.*, I, ii, 782) supposes that the fermentation is caused by special yeasts, in part true yeasts (*Saccharomyces anomalus* and a yeast with round spores), which are mixed with *Asperigillus*. See also *Chem. News*, 1899, p. 174, and *Jour. Chem. Soc.* (abs.), 1898, p. 395.

nitrification ; that is to say, *B. ramosus* breaks down the gelatine, and ammonia is formed ; this is then oxidized to nitrous acid by *Nitrosomonas*, and the nitrous acid is further oxidized to nitric acid by *Nitrobacter*."

In endeavoring to ascertain some knowledge of the physiology of symbiosis, it is apparent that in the "closely associated symbiosis, such as those composing a lichen, the ginger-beer plant, or a clump of symbiotic bacteria or fungi, researches have made it practically certain that the provision of definite food materials by the one symbiant for the other may be an important factor, *e. g.*, an alga supplies a fungus with carbohydrates, or a fungus converts starch into the fermentable sugars which the associated yeast needs. In other cases the advantage derived is one of protection from some injurious agent, *e. g.*, the aërobic bacterium prevents the access of oxygen to the anaërobic one." Other factors besides these are at work causing symbiotic fermentation, and Marshall Ward discusses them in the *Chem. News*, 1899, p. 173. The consideration of the subject of both enzymic and symbiotic fermentation is of great importance in the arts and medicine, as it is these enzymes, as well as other products which are secreted by the fungi, bacteria and other organisms, which are either useful or harmful, and which may be produced in extent and kind depending upon the quantity or quality of food materials at command.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

MORPHOLOGY AND HISTOLOGY OF PLANTS. Designed Especially as a Guide to Plant Analysis and Classification, and as an Introduction to Pharmacognosy and Vegetable Physiology. Part I. The Morphology of Plants, by Henry H. Rusby, M.D. Part II. Plant Histology, by Smith Ely Jelliffe, M.D., Ph.D. With 693 Illustrations. Published by the authors.

It is probably the experience of all schools and colleges of pharmacy that the per cent. of matriculants holding high-school diplomas has been a constantly increasing one from year to year. Furthermore, it is gratifying to note that most high schools are giving more attention to the study of the sciences, especially botany, than heretofore, so much so, in fact, that some universities leave the teaching of the elements of systematic and physiological botany to them, and require botany for entrance. As this is the exception, however, rather than the rule, and as many students, especially in pharmacy, have not enjoyed more than a common-school education, it becomes absolutely necessary in all teaching institutions of pharmacy to more or less thoroughly rehearse those departments of botany deemed essential to the proper study of pharmacognosy and materia medica. A suitable text-book for the use of pharmacy students, one which is not burdened with useless, dry details, and at the same time is written in plain, easily understood language, has been really wanting in America. In the writer's opinion there is no text-book which so nearly supplies this want as the second edition of the above-named book. It may be truly said that this edition has been made wider in its scope by the addition of a large amount of matter of a more general character, but this is no objection, since it serves a larger class of students.

Quoting from the author's preface, "the additional matter consists in part of a more complete treatment of the original topics, but more especially in the

addition of chapters on methods of floral dissection and analysis, the description of flowers by means of diagrams and formulæ, the morphology and classification of cryptogamous plants, classification and nomenclature, and on the collection and preservation of specimens. In the chapters devoted to reproduction, special pains have been taken to make clear the homologies and affinities between the flowering and flowerless plants."

Especially well have the chapters on Botanical Classification and Analysis and Botanical Nomenclature been written. Some may argue against the detailed treatment of the chapter on Cryptogams, but, as stated by the author, this has been supplied to meet the wants of other than pharmacy students.

Part I is characterized by originality of treatment of the subject, clearness, accuracy, and conciseness of expression, and superb selection of illustrative material, much of which is familiar to the student of pharmacy. In fact, this portion of the work possesses an individuality that is decidedly pleasing.

Part II treats of the Microscope, the Plant Cell, Cell Contents, Cell Wall, and Tissue Systems. The opportunity for original treatment is apparently not so great as in Part I, since the subjects are treated in an order and manner very similar to that of several well-known German text-books. It is unfortunate that it was found necessary to resort to such wholesale borrowing of foreign cuts for use in an otherwise distinctly American text-book. Such cuts suffer more or less by reproduction, as a glance through the second part will demonstrate. At least in the copy at hand many of the finer details have been entirely obliterated. A redeeming feature, however, is the faithful observance of the principle "credit to whom credit is due," a principle which is not religiously observed by all writers. The text is clearly written and admirably serves the purpose for which it was intended. Taken as a whole, this book is a great improvement over the first edition, and constitutes a very valuable and timely contribution to botanical literature. It certainly deserves and will doubtless receive the same hearty reception as its predecessor.

J. O. SCHLOTTERBECK.

UNIVERSITY OF MICHIGAN.

MICROSCOPY AND MICRO-TECHNIQUE. By Albert Schneider, M.D., Ph.D., Professor of Botany, Pharmacography and Materia Medica, Northwestern University School of Pharmacy. Ninety-five illustrations. Large Octavo; 190 pages. Chicago: Chicago Medical Book Company. 1899.

A practical guide to the use of the microscope may be regarded as an essential to every student of natural science, theoretical or applied, whether engaged in a course of home-study, and without instructor, or under the best possible conditions. Quite a number of such books have appeared during the past decade, and this, the last of them, certainly deserves to rank among the very best. Perhaps the most characteristic feature of Professor Schneider's work is the manner in which it supplements a thorough analysis of the laws of optics by a series of simple and non-technical explanations. Most of such works have been faulty in one or the other of these directions. While some have depended so completely upon mathematical equations as to be fitted only for such students as have enjoyed a thorough and liberal preliminary education, others have been so superficial as to fail utterly to appeal to the latter class. None can complain of Dr. Schneider's mathematics, as to either quality or quantity, yet any student will find it easy to omit these explanations, yet without failing to get a

fair working idea of the essentials of practice. The development of the microscope is treated historically, and is supplemented by a history of glass manufacture. This order appears to be one of the few features of the book open to criticism, as it does not conduce to clearness. The allotment of space to the different subjects treated is as follows: Reflection of Light has ten pages; Refraction, four; Intensity, two; Simple and Compound Microscopes, treated as machines, thirty-six; Micrometers, Camera Lucida, Micro-Photographic Apparatus and Test-objects, ten; Optical and Working Properties, twelve; Manipulation and Care, nine. Then follows Part II, in which forty-five pages are devoted to Micro-technique. A concluding chapter of twenty-five pages, which might well have been called Part III, is devoted to the Normal and Abnormal Eye. Here the author's medical training is put to good service, and the inexperienced microscopist is led to a knowledge of the results of defective vision upon the use of the microscope, and how to avoid them. Some very practical suggestions concerning the care of the eyes are added. All the information is thoroughly classified, and the instruction well systematized. The language is clear, and no reader, even if ignorant of the high abilities of the author as a histologist, could fail to realize that he writes on a familiar subject, and out of the fulness of personal experience. A complete index of five double-column pages completes the usefulness of this thoroughly commendable volume.

H. H. RUSBY.

INDICATORS AND TEST PAPERS—THEIR SOURCE, PREPARATION, APPLICATION AND TESTS FOR SENSITIVENESS. A résumé of the current facts regarding the action and application of the indicators and test papers which have been proposed from time to time and are in present use in chemical manipulations, with a tabular summary of the application of indicators. Designed for the use of chemists, pharmacists and students. By Alfred I. Cohn, Ph.G. First edition. First thousand. 1899. 12mo. ix-249 pages. Cloth, \$2. New York: John Wiley & Sons.

The book is divided into four parts. Part I, the introduction, contains general considerations, correct choice of indicators, application of indicators, action of indicators in other than aqueous liquids and the theory of the action of indicators.

Part II contains, in alphabetical order, the synonyms, source, preparation, properties and application of the various indicators considered.

Part III deals entirely with test papers, their preparation and application.

Part IV contains tables and a tabular summary of the principal indicators.

The object of this book is to give an up-to-date résumé of the various substances that have been employed as indicators in one form or another. The number of indicators considered is certainly comprehensive, but the author fails in a number of instances to bring his volume up to date. For instance, much of what is said concerning the influence of alcohol on indicators, on page 12, is based on a paper the conclusions of which have been shown to be the result of working with impure alcohol. In other words, *pure alcohol does not* appreciably affect the color reactions of most of the important indicators.

R. Schmitt's process for the manufacture of synthetic salicylic acid is not referred to in connection with this article, yet this method has probably superseded all others for manufacturing salicylic acid.

A number of errors have also crept in. The melting point of phenolphthalein (page 127) is given as 150° C., whereas it should be 250° C. The melting point of alizarin is about 282° C., instead of 215° C. (page 23). The formula for sodium hydroxide (page 223) is written NaOH, and potassium ferricyanide (page 142) is written K_6FeCy_{12} . The value of the book would be much enhanced if references to the original literature were given.

The style is generally clear, the type neat and the paper of good quality.

Notwithstanding some omissions and errors, the book contains much useful information collected from various sources of literature, and should find a place in every chemical library.

L. F. KEBLER.

PROCEEDINGS OF THE TWENTY-FIRST ANNUAL MEETING OF THE MISSOURI PHARMACEUTICAL ASSOCIATION, held in Jefferson City, June 6-9, 1899.

The following are the titles of the papers read: "Chemical Pharmacist or Pharmacist's Chemicals," by J. F. Lewellyn; "Commercial Pharmacy," by O. F. Bausch; "Contributions, from Date of Organization," by Ambrose Mueller; "Does It Pay the Pharmacist to Make Compressed Tablets?" by Ambrose Mueller; "Does the Attorney-General Understand the Situation?" by Francis Hemm; "Financial Points for a Retail Druggist," by O. T. Claus; "How to Make the Drug Business Pay," by Wm. Mittelbach; "Glucose Investigation," by C. M. T. Klie; "How to Secure the Family Trade for Spices and Flavoring Extracts," by G. H. J. Andreas and Wm. Mittelbach, independently; "Report on Metric System," by H. M. Whelpley; "Suggestions to Pharmacopœial Committee," by Francis Hemm; "Revision of the Pharmacopœia and the Retail Druggist," by G. D. Hinrichs; "Prescription Scale and Quantitative Chemical Work of the Druggist," by C. G. Hinrichs; "Women in Pharmacy," by F. de Wyl.

MINUTES OF THE PHARMACEUTICAL MEETING.

The regular monthly pharmaceutical meeting was held Tuesday, December 19th, in the Museum of the College, with James T. Shinn, Ph.M., in the chair.

Dr. A. R. L. Dohme, of Baltimore, was the first speaker on the programme and read a highly instructive paper on "The History of the Constitution of the Alkaloids." (See page 9.)

In introducing Dr. Dohme to the audience the chairman alluded to the educational advantages which he enjoyed and also to his special interest in the study of the alkaloids, both of which qualifications enabled him to speak with authority on the subject chosen.

In some preliminary remarks on the nature of his paper, Dr. Dohme said it would be found to deal largely with theory, but that this was a feature due to the necessity of having theories concerning the alkaloids before working out their constitution.

The paper elicited considerable discussion, and among those taking part in it were the chairman, Professors Moerk and Kraemer and Messrs. Kebler, Haussmann and Boring. Professor Moerk thought the address an excellent one and very opportune in one respect, as the students of the third year class, many of whom were present, are now being instructed in organic chemistry and just

about taking up the subject of the alkaloids. He, furthermore, moved that a vote of thanks be tendered Dr. Dohme and this motion was unanimously adopted.

Professor Kraemer was particularly glad that in the conclusion to his paper the author made a practical application of the knowledge involved in working out the theories concerning the alkaloids, for too often knowledge of this character is not appreciated at its full value by those interested in practical and commercial questions.

Referring to the comparison which Dr. Dohme made of the formulas of hydrastine, narcotine and papaverine, Mr. Kebler said that it is well known that the introduction of a single OH group will change the nature of some organic compounds very materially.

Dr. Dohme replied that in some of the simpler compounds an OH group might cause a considerable difference, but when complex substances like the alkaloids are considered, and an endeavor is made to trace some connection or some relation between structure and organic effect, the difference caused by such a group becomes less marked.

In answer to a query by Mr. Haussmann as to the cause of the black color produced when pilocarpine and cocaine are mixed with calomel, Dr. Dohme said that pilocarpine is an ammonia derivative and hence affects calomel, and in case of cocaine he thought that perhaps the CHO group would cause it to have a reducing action on calomel.

Charles H. La Wall was next on the programme and read an interesting paper entitled "The Herb and Drug Vendors on the Sidewalks of Philadelphia," which will be published in full in the February issue of this JOURNAL. Mr. La Wall said that he had been collecting data on this subject for several years and that he had become very much interested in it. Somewhat surprising was the statement made by him that 75 per cent. of the official drugs are growing within a radius of a few miles of Philadelphia, and also that more than 50 per cent. of the official drugs are sold on the streets of the city by persons who earn a livelihood by collecting them and preparing them for sale. The paper was accompanied by specimens and photographs of some of the vendors and their wares.

Professor Kraemer said that personally he was very much pleased that Mr. La Wall had taken up this subject. He said that he had known of persons going regularly to some one of these vendors for certain products on account of their excellent quality. In this connection he remarked upon the different channels into which the pharmacist's work is going and urged upon those present the necessity of obtaining a knowledge of just such subjects as were indicated in this paper. A vote of thanks was likewise tendered Mr. LaWall.

Mr. C. Carroll Meyer spoke of the cheapness and neatness of the packages of crude drugs put up by wholesale houses for retail purposes, but said that their quality was not likely to be known to the pharmacist.

Mr. E. M. Boring exhibited a sample of oil of orange; which, though quite old, was still in a state of preservation. This he said was due to the addition first of a small quantity of alcohol and then of water. Mr. Shinn said that he had also used a similar method—the difference being that he washed out the alcohol from the oil with the water, after which the oil kept very well.

On motion, the meeting adjourned.

FLORENCE YAPLE,
Secretary pro tem.

✻ CLASSES ✻

OF THE

PHILADELPHIA COLLEGE OF PHARMACY,

Seventy-ninth Annual Session, 1899-1900.

FIRST YEAR CLASS LIST.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Ackerman, Wm. Brown,	E. Mauch Chunk,	Pa.	Geo. L. Carnan.
Allen, Edwin Cullom,	Philadelphia,	Pa.	Wm. Egolf.
Alston, Wm. Algernon,	Haygood,	S. C.	
Anderson, Leon Cornelius,	Reading,	Pa.	H. H. Kline.
Ashmead, Virden Peter,	Philadelphia,	Pa.	Anna F. Ashmead.
Bacon, Vela,	Freehold,	N. J.	Bacon & Pittinger.
Baer, Herbert Oscar,	Wheeling,	W. Va.	W. S. Dixon.
Bair, Edward Elmer,	York,	Pa.	J. J. Weakley.
Baker, Daniel,	Belle Vernon,	Pa.	
Banta, Clarence La Rue,	Hanover,	Ind.	Dr. H. B. Morse.
Baum, Edward Eugene,	Batavia,	Ohio.	
Bell, Herman Alonzo,	Philadelphia,	Pa.	
Beegle, David Elmer,	Bedford,	Pa.	H. C. Blair.
Berberich, Joseph Herman,	Stein,	Germany.	J. Moffet, Jr.
Bibby, David Boone,	Catawissa,	Pa.	
Binder, Arthur Henry,	Meadville,	Pa.	T. W. Reuting.
Blew, Robt. St. Clair,	Bridgeton,	N. J.	C. W. Shull.
Blough, Elijah Roberts,	Johnstown,	Pa.	A. L. Yöder, M.D.
Bornemann, John Alexander,	Westphalia,	Germany.	H. M. Campbell.
Bowers, Robt. Ellerslie,	Mechanicsburg,	Pa.	E. C. Stout.
Boyer, Walter Ernest,	Danville,	Pa.	F. Ross Harmer.
Brightbill, Jonathan Furl,	Bedford,	Pa.	Irvine & Co.
Brock, George William,	Lockwood,	Mo.	
Brown, Herbert Wills,	Woodbury,	N. J.	J. W. Merritt.
Brown, Horsey Pierce,	Wilmington,	Del.	Z. James Belt.
Brown, Joel Daniel,	Philadelphia,	Pa.	W. A. Rumsey.
Brunhouse, Harry Franklin,	York,	Pa.	F. Brunhouse.
Bryant, Jas. Robeson,	E. Stroudsburg,	Pa.	W. H. Umstead.
Buckley, Martha,	Norristown,	Pa.	W. A. Costen.
Caden, Alice Beatrice,	Lexington,	Ky.	Adams & Morford.
Carmany, Jay Le Van,	Harrisburg,	Pa.	F. H. Boer.
Carter, Fredk. Phillips,	Beverly,	N. J.	A. W. Taylor.
Catlin, Joseph Albert,	Churchill,	Md.	J. J. Kelley.
Clemmer, John Krupp,	Lansdale,	Pa.	Jas. Williamson.
Collins, John Joseph,	Williston,	Me.	Wakefield Brothers.
Comfort, Carlton Chapell,	Philadelphia,	Pa.	Dr. J. W. Harrigan.
Craven, Alfred Young,	Bridgeport,	Pa.	H. L. Randall.
Crawford, Thos. Foster,	Camden,	N. J.	C. B. McLoughlin.
Croft, Clarence,	Chambersburg,	Pa.	G. L. Giger & Co.
Crothers, Anthony Brooks,	Cecil Co.,	Md.	J. L. Crothers
Dana, Lawrence Wellington,	Kane,	Pa.	E. H. Watkins.
Davis, Joseph Randall	Philadelphia,	Pa.	Dr. W. S. McGhee

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Dickinson, Ralph Brinton,	Parkersburg,	Pa.	J. B. Thompson.
Deweese, Everett Wheeler,	Philadelphia,	Pa.	E. C. Stout.
Dix, Robt. J. Gillingham,	Moorestown,	N. J.	G. H. Wilkinson.
Donoghue, Theresa Veronica,	Girardville,	Pa.	Dr. Jas. Donoghue.
Dougherty, Eugene R.,	Reading,	Pa.	Chas. Rentschler, Jr.
Doughty, Robert M.,	Millville,	N. J.	
Douglass, John Xavier,	Philadelphia,	Pa.	D. J. Reese.
Downs, Wm. Joseph,	Coaldale,	Pa.	John H. Bailey.
Dufford, John Albert,	West Sunbury,	Pa.	L. S. A. Stedem.
Eckels, Nathaniel Ort,	Shippensburg,	Pa.	A. L. Metz.
Evans, Thomas John,	Plymouth,	Pa.	G. J. Durbin.
Eves, Chas. Scott,	Millville,	N. J.	C. S. Ely.
Evrard, John Joseph,	S. Bethlehem,	Pa.	Kennedy & Burke.
Faust, Peter Winner,	Claussville,	Pa.	H. L. Keiper.
Feeney, Patrick Joseph,	Germantown,	Pa.	A. B. Newton.
Fetterolf, C. Fredk. Garfield,	Ashland,	Pa.	H. L. Stiles.
Filman, Walter Theodore,	Warwick,	Pa.	H. L. Klopp.
Fitch, Jas. Clarence,	Philadelphia,	Pa.	Dr. P. Fitch.
Fleischer, Wm. Paul,	Philadelphia,	Pa.	F. E. Johnson, M. D.
Foehl, Philip C.,	Lancaster,	Pa.	H. H. Ross.
Fox, Irvin Berry,	Lebanon,	Pa.	J. L. Lemberger & Co.
Fox, Joseph P.,	Philadelphia,	Pa.	P. P. Fox, Sr.
Fried, Percy,	Allentown,	Pa.	F. P. Semmel, Jr.
Fuller, Royston Chas. Tupper,	Amherst,	N. S.	R. C. Fuller & Co.
Gagan, George,	Wilmington,	Del.	H. C. Blair.
Gage, Luther Hendrick,	Leraysville,	Pa.	W. D. Johnson.
Garman, Ovy William,	Nora Springs,	Ia.	J. H. Atkinson & Co.
Gearhart, Malcolm Zieber,	Reading,	Pa.	S. S. Stevens.
Gehring, Edwin Franklin,	Allentown,	Pa.	O. J. J. Haines.
Geron, Yeatman,	Huntsville,	Ala.	J. D. Humphrey & Son.
Gettel, John Ralph Elkrode,	Shippensburg,	Pa.	J. C. Altick & Co.
Giles, Edward Wm.,	Columbia,	S. C.	J. J. Leggett.
Goodman, Edith Morton,	Denver,	Col.	Dr. Susan Hayhurst.
Goring, Wyatt Edward,	Wappinger Falls,	N. Y.	Geo. Howarth.
Greenberg, Dora,	Roumania,	Europe.	
Hamilton, Harry Schroyer,	Mechanicsburg,	Pa.	Dr. Long.
Hand, Reu,	Cape May,	N. J.	Dr. Mecray.
Harrington, Bertram John,	New Brunswick,	Canada.	J. C. Perry.
Handwork, Francis Collins,	Birdsboro,	Pa.	R. Clark.
Hartung, Edward Wm.,	Philadelphia,	Pa.	H. S. Butz.
Hawkins, Louis Jefferis,	Coatesville,	Pa.	W. S. Young.
Hayes, John Gilbert,	St. Clair,	Pa.	Harry Davis.
Heffelfinger, Wm. Edward,	Reading,	Pa.	J. H. Stein.
Henderson, Luther Bateman,	Newport,	N. J.	
Hendrickson, Raymond,	San Francisco,	Cal.	W. H. Gano.
Hertzler, Norman Eberly,	Philadelphia,	Pa.	Fred. Brown Co.
Hertzler, Oliver Henry,	Lancaster,	Pa.	C. A. Heinitsh, dec'd.
Hibbs, Wm. Buckman,	Newtown,	Pa.	Wm. R. Elliott.
Hilliard, Bayard,	Vincentown,	N. J.	F. S. Hilliard.
Hougendobler, Harry Smaltz,	Columbia,	Pa.	W. H. Hickman.
Irvin, John Henry,	Philadelphia,	Pa.	A. Wilson.
Jaego, Harry W. Garfield,	Millville,	N. J.	P. F. Haas.
Jefferis, Charles Albert,	Philadelphia,	Pa.	Funk & Groff.
Jones, Howard Harlan,	Norristown,	Pa.	Atwood Yeakle, Ph.G.
Kane, Augustin Francis,	Brooklyn,	N. Y.	Dr. F. F. Druding.
Kellar, William Albert,	Cripple Creek,	Col.	Central Drug Co.
Kennedy, Wm. Morton,	Philadelphia,	Pa.	C. J. Siglinger.
King, Charles Tomlinson,	Wellsborough,	Pa.	J. N. G. Long.
Kirk, Frank Hall,	Curwensville,	Pa.	Shinn & Baer.
Klinka, Adolph Jules,	Philadelphia,	Pa.	

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Knabb, Milton H.,	Reading,	Pa.	W. H. Raser.
Knauss, Howard James,	Allentown,	Pa.	Dr. R. C. Peter, Ph.G.
Koller, Charles Joseph,	Altoona,	Pa.	C. G. Neely.
Kyle, Janet.	Milroy,	Pa.	
Kyle, Christian Bauer,	Middletown,	Pa.	C. E. Bowers.
Lebegern, Barton,	Columbia,	Pa.	Eberly Brothers.
Lescure, Anna R.,	Philadelphia,	Pa.	
Lewis, Herbert Willard,	Springfield,	Mass.	Harry P. Elvey.
Lide, Leighton Elba,	Columbus,	Miss.	Mayo & Weaver.
McGarrab, Wm. Henry, Jr.,	Scranton,	Pa.	T. D. McPhee.
McGregor, Albert Dell,	Maywood,	Ill.	G. M. Beringer.
Marcus, Simon,	Philadelphia,	Pa.	W. A. Shannon.
Margolin, Fannie Bezman,	Philadelphia,	Pa.	J. H. Hackett.
Martin, Charles Edward,	Columbia,	Pa.	E. C. Shafer.
Martin, Frederick Adams,	Atlantic City,	N. J.	J. V. Townsend.
Martin, John M.,	Birmingham,	Ala.	W. R. Gunn.
Matlack, Walter Ball,	Bridgeton,	N. J.	G. Y. Wood.
Meals, Ira Dale,	Harrisburg,	Pa.	Dr. C. T. George.
Meredath, Wilbur Curtis,	Wagontown,	Pa.	R. H. Lackey.
Metzler, Oscar Leroy,	Harrisonville,	Pa.	J. A. Ferguson.
Mewhorter, Harry Stuart,	Norristown,	Pa.	W. A. Costen.
Miller, Roy L.,	Union Bridge,	Md.	
Morgan, Wm. Ellis,	Eldorado,	Ark.	Dr. W. H. Goodwin.
Munger, Lewis,	Chester,	Pa.	D. P. Madden.
Murphy, Dennis Arthur,	Monson,	Mass.	G. L. Keeney.
Myers, Luther Melanothon,	Carlisle,	Pa.	B. F. Emrick.
Noble, Harry Carty,	Manayunk,	Pa.	H. M. Levering.
Oberly, John Shimer,	Easton,	Pa.	A. L. Serfass.
O'Hanlon, Joseph Thornley,	Pennington,	N. J.	G. W. Scarborough.
Orr, James Alexander,	Belfast,	Ireland.	S. H. Shingle.
Parker, James Heber,	Reading,	Pa.	J. H. Stein.
Phillips, Eliot Earle,	Philadelphia,	Pa.	W. P. Bender.
Quin, Vincent De Paul,	Lansford,	Pa.	J. A. Quin.
Ramsaur, David Wilfong,	Palatka,	Fla.	M. W. Stewart.
Raum, Harry Angle,	Shippensburg,	Pa.	D. H. Ross.
Reeve, Albert Warfield,	Elmer,	N. J.	J. M. Garrison, Jr.
Reice, Isaac Stephen,	Bloomsburg,	Pa.	Moyer Brothers.
Renaker, Houston,	Cynthiana,	Ky.	J. M. Renaker.
Rhoder, Geo. Washington,	Newark,	Del.	Dr. J. B. Butler.
Rigg, Bernard,	Keansburg,	Ill.	
Robinson, David Crogman,	Philadelphia,	Pa.	H. M. Minton.
Robinson, Thomas Holmes,	Bealston,	Va.	F. J. Lammer.
Roeder, Morris Albert,	Schuylkill Haven,	Pa.	C. S. Commings.
Roessler, Harry Link,	Philadelphia,	Pa.	H. A. Smith.
Roessler, Henry Wayman,	Philadelphia,	Pa.	W. H. Laubach, Jr.
Rudolph, Harold Clarence,	Pottsville,	Pa.	J. P. Frey.
Schiesser, Harry William,	Philadelphia,	Pa.	Dr. P. M. Kelly.
Scott, Walter Edward,	Pomeroy,	Pa.	J. G. Long.
Seal, John Horace,	Swarthmore,	Pa.	Dr. A. K. Morton.
Seeley, Chester Belting,	Bridgeton,	N. J.	G. H. Whipple & Son.
Sharp, Wm. Luther,	Keansburg,	Ill.	J. T. Legier.
Shaw, Saml. Frederick,	Philadelphia,	Pa.	G. B. Evans.
Shaw, Wm.,	St. Louis,	Mo.	
Slobig, Charles Henry,	Ashland,	Pa.	R. J. Williams.
Smith, Henry Wm.,	Pottstown,	Pa.	E. S. Beshore.
Smith, Karl Waller,	Marietta,	Pa.	R. W. Cuthbert.
Smith, Wm. David Harris,	Jonesboro,	Tenn.	J. B. Park.
Soken, Joseph Lewis,	Zitsmir,	Russia.	Dr. Seldes.
Stauffer, John Keeler,	Goodville,	Pa.	C. G. Treichler.
Stolz, David,	Syracuse,	N. Y.	G. I. Thorpe.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Strauss, Robert Franklin,	Womelsdorf,	Pa.	F. I. Landis.
Stuver, Henry Wm.,	Fort Collins,	Col.	W. W. Scott.
Swartz, Wm. Luther,	Carlisle,	Pa.	G. W. Sipe.
Swineford, Ernest Clarence,	Mifflinsburg,	Pa.	Dr. F. B. Brubaker.
Taylor, James Alfred,	Flat Rock,	S. C.	J. A. Taylor.
Terne, Bruno Henry, Jr.,	Chicago,	Ill.	H. B. Terne.
Thomas, George Carroll,	Lima,	Pa.	Dr. Wingender.
Toulson, John M.,	Chestertown,	Md.	M. A. Toulson.
Trost, Wm. Christian,	Ashland,	Pa.	A. Schoenberger.
Tyler, Ephraim Shaw,	Bridgeton,	N. J.	W. A. Rumsey.
Ulrich, Ralph Thomas,	Manheim,	Pa.	E. E. Gibble, M.D.
Waldenberger, William,	Manayunk,	Pa.	Louis Waldenberger.
Walther, Philip,	Meadville,	Pa.	V. W. Eiler.
Warner, Harold Clevenger,	Pemberton,	N. J.	Davis & Bro.
Weidemann, George Buzby,	Philadelphia,	Pa.	C. A. Weidemann.
Weigester, Wilson,	Troy,	Pa.	Carpenter & Pierce.
Welch, William Herbert,	Philadelphia,	Pa.	M. J. Wilson.
West, Emile,	Chambersburg,	Pa.	Jno. S. Zapirtz.
White, Albert Russell,	Caribou,	Me.	F. L. White.
Wildasin, Guy Otto,	Dayton,	Ohio.	A. L. Green.
Williams, Morrison Patton,	Charlotte,	N. C.	Shinn & Baer.
Wilson, Oscar Herman,	Frankford,	Phila.	H. J. Siegfried.
Winkler, Max Erwin,	Philadelphia,	Pa.	Max Winkler.
Winstauley, John,	Philadelphia,	Pa.	B. A. Wissler.
Wisegarver, Oscar Kline,	Quarryville,	Pa.	T. M. Sohner.
Wollaston, Byron Parker,	Kennett Square,	Pa.	Wm. C. Pierce.
Woodill, Robt. Franklin,	Boston,	Mass.	C. E. Keeler.
Worthington, J. W. Wolfe,	Philadelphia,	Pa.	Chas. H. Clark.
Ziegler, Chas. Norman,	Gettysburg,	Pa.	L. Genois.
Ziegler, Wm. Lodge, Jr.,	Steelton,	Pa.	W. L. Ziegler, M.D.
Zinn, Edwin Clarence,	Carlisle,	Pa.	W. F. Horn.

SECOND YEAR CLASS LIST.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Alden, Harley Roscoe,	Auburn,	Me.	Dr. A. J. Pollard,
Barnett, Eldredge Ewing,	Cape May City,	N. J.	D. C. Guthrie.
Bell, Robert Nevins,	Kearney,	Neb.	S. A. D. Henline.
Benner, Fredk. James,	Bethlehem,	Pa.	P. Kempsmith,
Boesch, Theodore Karl,	York,	Pa.	A. H. Lafean & Bro.
Boltz, Paul Kline,	Lebanon,	Pa.	E. K. Boltz.
Boysen, Theophilus H., Jr.,	Egg Harbor,	N. J.	T. H. Boysen, M.D.
Brenner, Frederic A.,	Kylertown,	Pa.	L. C. Funk.
Cather, Frank L.,	Chester,	Pa.	Wm. H. Farley.
Collins, Lane Verlinden,	Philadelphia,	Pa.	Jno. P. Frey.
Cone, Earl Hobart,	Batavia,	N. Y.	N. S. & J. J. Patterson.
Converse, Howard Romaine,	Picture Rocks,	Pa.	Moyer Brothers.
Corson, Harry Le Roy,	Jersey Shore,	Pa.	B. E. Staples.
Davis, William Brown,	Edwardsdale,	Pa.	D. E. Lewis.
Dean, Chester Clayton,	Philadelphia,	Pa.	C. R. Haig.
Dodson, Henry Malcolm,	Delta,	Pa.	M. L. Holloway.
Dunn, Edwin Alfred,	Meadville,	Pa.	P. H. Utech.
Dutton, John Fredrick,	Philadelphia,	Pa.	H. Minton.
Eckels, Paul,	Decatur,	Ill.	Chas. A. Eckels.
Eddy, Roswell Martin,	Philadelphia,	Pa.	
Eppler, George Theodore,	Philadelphia,	Pa.	E. E. Wilson & Co.
Fegley, Florence Augusta,	Allentown,	Pa.	O. Fegley & Bro.
Fegley, John Stauffer,	Allentown,	Pa.	O. Fegley & Bro.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Fischer, Adolph Gustav,	Philadelphia,	Pa.	Albert Oetinger.
Fisher, George Calvin,	Philadelphia,	Pa.	Edwd. Fisher.
Fleming, Samuel Clarkson,	York,	Pa.	Jas. C. Perry.
French, Rolland Hall,	Salem,	Ohio.	Bolger & French.
Garber, E. Franklin Weaver,	Mt. Joy,	Pa.	H. G. Haring.
Gliem, Harry Charles,	Hazleton,	Pa.	McNair & Hoagland.
Goodyear, Harry J.,	Cornwall,	Pa.	J. L. Lemberger.
Graham, Willard Rice,	Philadelphia,	Pa.	Smith, Kline, French Co.
Grove, Harry Röss,	Alexandria,	Pa.	R. T. Blackwood.
Harbord, Kittie Walker,	Salem,	Ore.	D. J. Fry.
Harris, Wm. K. Garfield,	Altoona,	Pa.	Dr. F. Barr.
Hassinger, Samuel Reed,	Philadelphia,	Pa.	S. E. R. Hassinger.
Haydock, Mabelle,	Philadelphia,	Pa.	Susanna G. Haydock.
Headings, Prestie Milroy,	Reedsville,	Pa.	Dr. H. W. Sweigart.
Highfield, Herbert Monroe,	Zanesville,	Ohio.	Bailey Drug Co.
Hinski, Oscar,			
Hoffert, Charles Edward,	Lancaster,	Pa.	C. E. Keeler.
Hoffman, Ira Calvin,	Johnstown,	Pa.	H. B. Hefley.
Houston, Franklin Paxson,	Philadelphia,	Pa.	R. T. Young.
Hubler, Guy Garfield,	Gordon,	Pa.	J. E. Gregory.
Hughes, Julia Pearl,	Charlotte,	N. C.	J. M. Porter.
Janisch, Fredk. Wm.,	Philadelphia,	Pa.	Emil Jungmann.
Jetton, James Stuart,	Dyer,	Tenn.	Hays & Grigsby.
Klopp, Edward Jonathan,	Richland,	Pa.	H. C. Blair.
Knerr, Charles George,	Allentown,	Pa.	J. W. Shoemaker & Co.
Kraus, Otto S.,	New Haven,	Conn.	Otto Kraus.
Leiby, Howard E.,	Philadelphia,	Pa.	F. G. Mumma.
Leshner, Benjamin Porter,	Chambersburg,	Pa.	And'w Blair & Co.
Levering, John Hartraft,	Norristown,	Pa.	J. C. Life.
Lewis, Fielding Otis,	Hibbardsville,	Ky.	R. M. McFarland.
Liebert, Lewis William,	Philadelphia,	Pa.	H. C. Clapham.
Luebert, Fred'k George,	Philadelphia,	Pa.	E. G. F. Mickleby.
Luddy, Jas. Darrah,	Philadelphia,	Pa.	F. P. Streiper.
McClintock, Geo. Washington,	Key West,	Fla.	H. C. Blair.
McClurg, Benjamin Hoffer,	Elizabethtown,	Pa.	A. H. Bolton.
McDermott, Rob't Joseph,	Trenton,	N. J.	A. S. Wickham.
McFadden, Warren Lester,	Williamsport,	Pa.	Duble & Cornell.
McLaughlin, Harry Aloysius,	Philadelphia,	Pa.	N. Richardson.
McPhee, John James,	New Glasgow,	N. S.	T. D. McPhee.
Manger, Harry Fillmen,	Pottstown,	Pa.	J. D. Seiberling.
Metcalf, Hiram Kennedy,	Greencastle,	Pa.	C. H. Beetem.
Michels, Victor Clyde,	Albion,	Ill.	B. F. Michels.
Murphy, Edwin Mason,	Macon,	Miss.	T. S. Murphy.
Musser, Guy Musselman,	Witmer,	Pa.	R. W. Cuthbert.
Nauss, George Hill,	Steelton,	Pa.	W. K. Martz.
Penrose, Thos. William,	Philadelphia,	Pa.	F. W. E. Stedem.
Picking, Jr., Jacob Sylvester,	Somerset,	Pa.	F. C. Kreis, M.D.
Pittinger, Charles A.,	Freehold,	N. J.	E. G. Bacon.
Pfleiger, Adam W.,	York,	Pa.	A. L. Ziegler.
Pollins, Harry Geo. Lomison,	Greensburg,	Pa.	S. P. Brown.
Post, Arthur Edward,	Towanda,	Pa.	F. E. Post.
Raser, Jr., Wm. Heyl,	Reading,	Pa.	John B. Raser.
Redcay, Franklin,	Pottsville,	Pa.	Dr. E. D. Miller.
Reinhart, J. Quigley,	Shepherdstown,	W. Va.	H. B. Morse.
Reynolds, Clarence Hyatt,	Reynoldsville,	Pa.	S. Reynolds, M.D.
Rhoads, Luther K.,	Reading,	Pa.	C. H. Raudenbresh.
Rinker, William,	Hellertown,	Pa.	F. E. Jacobson.
Roberts, Geo. Wm.,	Philadelphia,	Pa.	W. R. Warner & Co.
Roberts, John A.,	Beverly,	N. J.	Dr. A. W. Taylor.
Rogers, Walter Clyde,	West Chester,	Pa.	F. P. Rogers.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Ryan, Thomas Andrew,	Susquehanna,	Pa.	W. S. Mitchell.
Saul, Irvin Ellsworth,	Windsor Castle,	Pa.	J. W. Pechin.
Schepp, Wm. Frederick,	Wheeling,	W. Va.	G. H. Ebeling.
Schmucker, A. Alexander,	Allentown,	Pa.	J. L. Crothers.
Schneider, Emil Sebastian,	Philadelphia,	Pa.	Philip Goll.
Schooley, Joseph Griggs,	Montgomery,	Pa.	J. L. Miller.
Scott, Wm. Henry,	Waynesburg,	Pa.	Dr. Brock.
Shafer, Clarence Eugene,	Altoona,	Pa.	H. L. Stiles.
Shannon, Byron Guest,	Pennsgrove,	N. J.	A. C. Schofield.
Shaver, D. Oscar,	Altoona,	Pa.	C. C. Meyer.
Sheffer, Wm. W.,	Dillsburg,	Pa.	Lawson C. Funk.
Shenkle, Albert Philip,	Phœnixville,	Pa.	M. R. Shenkle.
Shields, Percy Way,	West Chester,	Pa.	M. W. Bowman.
Skillman, Lionel Gilleland,	Philadelphia,	Pa.	Shoemaker & Busch.
Slocum, Chas. Evan,	Ouray,	Col.	E. E. Stratton.
Spears, Edwd. Gibson,	Reading,	Pa.	H. H. Kline.
Sprague, Hugh Boleyn,	Salt Lake City,	Utah.	Druel & Franken.
Steever, Wm. Forsaith,	Millersburg,	Pa.	Chas. C. Steever.
Stern, Wilson Clinton Ammon,	Philadelphia,	Pa.	D. B. Richards.
Stoudt, Irwin Sylvester,	Obold,	Pa.	Geo. F. Wood.
Strathie, Alex. John,	Handcross,	England.	Wm. J. Jenks.
Texter, Charles Henry,	Perkasie,	Pa.	Harry Neamand.
Thomas, Wallace Crouch,	Thomas,	Pa.	M. B. Fritz.
Thompson, Samuel,	Philadelphia,	Pa.	
Tingle, John Beard,	Dayton,	O.	Ed. M. Boring.
Townsend, Wm. Sidney,	Pocomoke,	Md.	H. N. Willis.
Tyler, Joseph Clark,	Mt. Sterling,	Ky.	R. C. Lloyd.
Urffer, Samuel,	South Bethlehem,	Pa.	H. W. Sheets.
Van Gelder, Levi,	Petersburg,	N. J.	C. B. McLaughlin.
Watson, Herbert James,	Wilmington,	Del.	H. K. Watson.
Wolfer, William Conrad,	Philadelphia,	Pa.	Ed. C. Stout.
Wolfinger, John Philip,	Reading,	Pa.	H. J. Schad.
Ziegler, C. Harry,	York,	Pa.	N. B. Fry.

THIRD YEAR CLASS LIST.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Albright, Allen Enos,	Allentown,	Pa.	W. L. Hatzell.
Anderson, George Charles,	Meadville,	Pa.	A. S. Ballinger.
Andrews, Wm. Hall,	Woodstown,	N. J.	G. M. Andrews.
Austin, Chas. Howard,	Woodstown,	N. J.	Theo. Campbell.
Baker, Mainard Leshner,	Cowan,	Pa.	C. W. Warrington.
Barker, Laura A.,	Houtzdale,	Pa.	B. W. Wood.
Bartholomew, Arthur,	Golden City,	Col.	J. M. Higgins.
Bayles, John Wyckoff,	Mt. Holly,	N. J.	
Beatty, Arthur William,	St. Louis,	Mo.	H. C. Blair.
Bishop, Wm. H. Pancoast,	Carversville,	Pa.	J. H. Bishop.
Blew, Jos. Oscar,	Bridgeton,	N. J.	C. F. Dare & Son.
Borrowes, Geo. Henry,	Philadelphia,	Pa.	D. Jamison.
Bosler, Harry Ellis,	Olean,	N. Y.	J. C. Welsh.
Bowers, Howard Levin,	Tuxton,	Pa.	J. C. Perry.
Branin, Manlif Lewis,	Millville,	N. J.	C. B. McLaughlin.
Brookes, Virginia Cade,	Waelder,	Tex.	S. Hayhurst.
Brooks, Walter.	Quarryville,	Pa.	T. M. Rohrer.
Buckman, Wm. Watson,	Newtown,	Pa.	H. Cox.
Burchfield, Wm. Clinton,	Pottsville,	Pa.	R. J. Williams.
Carey, Harris May,	Wyoming,	Del.	M. O. Harris.
Cartwright, Sanford Warren,	Fresno,	Cal.	J. L. Crothers.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Casperson, Henry Lyle,	Clayton,	Del.	W. R. Keys.
Connell, Frank Joseph,	Pottstown,	Pa.	
Cook, Ernest Fullerton,	Waynesboro,	Pa.	G. M. Beringer.
Corson, Thomas Clark,	Philadelphia,	Pa.	W. J. Scott.
Crawford, William Harvey,	Ashbourne,	Pa.	
Dentler, Roy W.,	Turbotville,	Pa.	F. W. Ely.
Desch, Edward Allen,	Fogelsville,	Pa.	C. J. Biddle.
Dietz, Harry Edgar,	Lock Haven,	Pa.	G. W. Mason.
Doake, Robert Stewart,	Philadelphia,	Pa.	Theodore Campbell.
Dooley, John Joseph,	Plymouth,	Pa.	G. J. Durbin.
Dorman, Harry Milton,	Phoenixville,	Pa.	W. A. Dorman.
Doughty, John Thompson,	Millville,	N. J.	A. La Dow.
Duffy, Thomas Anthony,	Carbondale,	Pa.	B. A. Kelly.
Eddy, Eugene Henry,	Loraine,	Ohio.	J. H. Falkins.
Edwards, Manly Bruce,	Bloomsburg,	Pa.	G. P. Ringler.
Eldridge, William Arthur,	Salem,	N. J.	F. Luerssen.
Eshleman, Ellis Good,	Faggs Manor,	Pa.	C. W. Warrington.
Fabian, Asa,	Ottsville,	Pa.	R. H. Fackey.
Faunce, George Castor,	Philadelphia,	Pa.	T. W. Hargreaves.
Fiet, John Jacob,	Philadelphia,	Pa.	H. J. Fiet.
Fisher, John Anthony,	Tremont,	Pa.	J. H. Schultz.
Fox, Harry T.,	Zanesville,	Ohio.	Chappelle & Sons.
Franke, Louis,	Johnstown,	Pa.	C. G. Campbell.
Garritt, Henry James,	Huron,	Ohio.	J. M. Garritt.
Greenberg, Jacob,	Novomirgorod,	Russia,	M. Reissakovitch.
Griest, Joseph Taylor,	Peoria,	Ill.	W. M. Benton.
Gruel, John Edward,	Lancaster,	Pa.	J. C. Long.
Guest, Wilbert Hillman,	Woodstown,	N. J.	W. G. Nebig.
Hampson, William Harvey,	Philadelphia,	Pa.	F. F. Drueding.
Hand, Wilson H.,	Stillwater,	Ok. T'y.	W. R. McGeorge.
Harmony, Edmund Franklin,	Allentown,	Pa.	C. Shoemaker.
Hauber, Christian Henry,	Philadelphia,	Pa.	F. W. Hausmann.
Heinze, George Elmer,	Ashland,	Pa.	A. Schoenenberger.
Heckman, John George,	Meadville,	Pa.	Lindman & Heckman.
Hemberger, Paul Edward,	Dayton,	Ohio.	Jno. N. Prass.
Hilbish, John Henry,	Fredericksburg,	Va.	Jno. C. Greisemer.
Hillebrand, William Gustav,	Philadelphia,	Pa.	W. N. Seary.
Hires, Lewis Moore,	Bridgeton,	N. J.	Reeve & Fithian.
Hughes, Harry Wilbert,	Millville,	N. J.	H. A. Nolte.
Irby, Moreland Russell,	Ashland,	Va.	N. Knight.
Jaeger, William Charles,	Philadelphia,	Pa.	C. H. Bohn.
Jelliff, Glenn Eli,	Mansfield,	Pa.	G. F. Ralston.
Kazanjian, Rupen Hagop,	Armenia,	Adana,	W. L. Matthews.
Kelly, Edward Joaquin,	Philadelphia,	Pa.	L. S. A. Stedem.
Kiefer, William Frederick,	Philadelphia,	Pa.	C. A. Gill.
Kilgus, Harry Edward,	Renovo,	Pa.	M. L. Clay.
King, Lloyd Stanley,	Dayton,	Ohio.	W. P. Graybill.
Kintzer, Harry Augustus,	Womelsdorf,	Pa.	F. T. Landis.
Landauer, Oscar,	Philadelphia,	Pa.	Theodore Sprissler, M.D.
Lehman, Samuel William,	Shippensburg,	Pa.	J. C. Altick & Co.
McCaffrey, Ward Boleyn,	Berkeley Springs,	W. Va.	T. W. Hodgson.
McClure, Charles Nevin,	York,	Pa.	L. K. Slifer.
McDonnell, Wm. Joseph,	Philadelphia,	Pa.	C. P. McDonnell.
McElwain, William Thomas,	Chambersburg,	Pa.	C. W. Keefer.
Mackey, Joseph Quarll,	Avondale,	Pa.	L. C. Funk.
Magee, Michael Vincent,	Conshohocken,	Pa.	T. F. McCoy.
Maier, Frank Joseph,	Woodbury,	N. J.	A. S. Marshall.
Manges, Willis Fastnacht,	Philadelphia,	Pa.	W. H. Gano.
Meredith, Harry Lionel,	Hagerstown,	Md.	Aughinbaugh & Son.
Merz, Alfred William,	Wurtenburg,	Germany.	E. W. Herrmann.

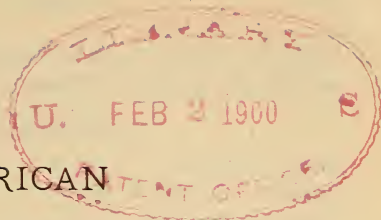
<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Meuser, Charles John,	Easton,	Pa.	C. L. Bachman.
Michael, George Albert,	Lebanon,	Pa.	C. E. Boger.
Miles, James Bargillar, Jr.,	Helena,	Ark.	
Miller, Bertrand Le Roy,	Liberty,	Pa.	W. A. Musson.
Moeller, Carl Frederick Edw.,		Germany.	W. H. Hickman.
Morgan, Lulu Annette,	Scranton,	Pa.	Mathews Brothers.
Morris, William Torrey,	Penn Yan,	N. Y.	Jas. F. Ross.
Ohliger, Willard,	Wooster,	O.	Zimmerman & Co.
Peiffer, Arthur,	Philadelphia,	Pa.	Steltz & Co.
Piefer, Wm.			
Pursel, Robert Clayton,	Bloomsburg,	Pa.	Moyer Brothers.
Quinn, Francis Denniss,	Johnsonburg,	Pa.	
Rectenwald, Daniel Louis,	Pittsburg,	Pa.	F. W. E. Stedem.
Ricketts, Clarence Emerson,	Kane,	Pa.	E. H. Watkins.
Russell, Walter Harold,	Philadelphia,	Pa.	S. H. Conover.
Saurman, James Spang,	Norristown,	Pa.	Baker & Grady.
Schad, Frank Casper,	Tamaqua,	Pa.	L. J. Steltzer.
Schmidt, Oscar Charles,	Philadelphia,	Pa.	G. A. Barwig.
Scott, John Calvin,	Hamburg,	Pa.	A. J. Rink.
Scott, Levi,	Camden,	Del.	Wilkinson & Wilkinson.
Seabold, Harry Adam Fehnstock,	Annville,	Pa.	W. S. Seabold.
Seip, Charles Louis,	Philadelphia,	Pa.	G. C. Ochse.
Settle, Peter Smith,	Frankford,	Pa.	T. H. Price.
Seward, Frank Gates,	Norwich,	N. Y.	Norwich Pharmacal Co.
Shapiro, Henry,	Vetevsk,	Russia.	F. W. E. Stedem
Siegle, Herman Christian,	Peoria,	Ill.	A. W. H. Reed.
Simcox, Howard Leon,	Philadelphia,	Pa.	Geo. W. Bowen.
Smiley, Frances Jane,	Philadelphia,	Pa.	Wm. Procter, Jr., Co.
Smith, George Carroll,	Pottstown,	Pa.	Eberly Brothers.
Speck, Herbert Arthur,	Bethlehem,	Pa.	Paul Kempsmith.
Stacks, Abraham Homer,	York,	Pa.	C. Perry.
Stolz, Louis,	Syracuse,	N. Y.	
Stout, B. Frank,	Quakertown,	Pa.	N. S. Stiltzer.
Sullivan, James Francis,	Philadelphia,	Pa.	G. H. West.
Sunday, Carlton Pierce,	York,	Pa.	W. Carroll Taylor.
Tucker, Robert Woodliffe,	Hamilton,	Bermuda Is.	Freeman & Pettyjohn.
Weaver, Christian	Naestock,	Denmark.	
Werts, John La Monte,	Renovo,	Pa.	C. P. Landis.
Wilkinson, Harry,	Philadelphia,	Pa.	R. P. Wilkinson.
Williams, Joseph James,	Conshohocken,	Pa.	John W. Pilgrim.
Witman, Charles Daniel,	Middletown,	Pa.	J. W. Renalt.
Witmeyer, Samuel David,	Lebanon,	Pa.	Shinn & Baer.
Wyckoff, Elmer E.,	Rock Island,	Ill.	
Young, Alexander, Jr.,	Jenkintown,	Pa.	S. C. Henry.
Young, Edwin Henry,	S. Bethlehem,	Pa.	Cyrus Jacoby.

SENIORS.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Preceptor.</i>
Becht, Frederick,	Philadelphia,	Pa.	Bullock & Crenshaw.
Entwistle, Albert Henry,	Philadelphia,	Pa.	Chas. H. Roberts.
Filer, Burrett Boynton,	Hammonton,	N. J.	J. Frank Mead, M.D.
Jaeger, Chas. Fred'k,	Philadelphia,	Pa.	E. E. Bostick.
Malin, George Lawrence,	Atlantic City,	N. J.	Willard Wright, dec'd.
Peck, Wm. George,	Nottingham,	Eng.	J. Frank Mead, M.D.
Tesl, Ellwood Allen,	Lancaster,	Pa.	Jno. H. Kerr.

SPECIAL STUDENTS.

<i>Name.</i>	<i>Place.</i>	<i>State.</i>	<i>Department.</i>
Capwell, Harry M.,	Philadelphia,	Pa.	Chemistry.
Carter, F. P.,			Chemistry.
Cavanagh, Frank Arthur,	Ashbourne,	Pa.	Chemistry.
Chapman, Rich'd Henry, Jr.,	Philadelphia,	Pa.	Chemistry.
Crawford, Wm. Henry,	Ashbourne,	Pa.	Chemistry.
Eddy, Eugene Henry,	Lorain,	Ohio.	Chemistry.
Ehman, J. W.,			
French, Rolland Hall,	Salem,	Ohio.	Chemistry.
Gagarn, George,	Wilmington,	Del.	
Jaeger, W. C.,			Chemistry.
Leas, Fred. C.,	Philadelphia,	Pa.	Chemistry.
McMahon, Joseph Alaphonsus,	Lock Haven,	Pa.	Chemistry.
Michels, Victor Clyde,	Albion,	Ill.	Chemistry.
Roberts, John Austin,	Wilmington,	Del.	Chemistry.
Shannon, Sam'l Coward,	Philadelphia,	Pa.	Chemistry.
Stolz, Louis,	Syracuse,	N. Y.	Chemistry.
Suess, Ignatz,	Grand Messeritsch,	Austria.	Chemistry.
Thompson, Samuel,			
Voss, Fred. C.,			
Wyckoff, E. E.,	Rock Island,	Ill.	Chemistry.



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THE DRUG AND HERB VENDORS OF THE SIDEWALKS
OF PHILADELPHIA.

BY CHARLES H. LAWALL.

Pharmacy as a profession has made great progress during the past few decades, but, while it has developed along certain lines, the development has mainly pertained to improvements in the preparation of galenicals and it has lost ground in other directions, particularly in pharmacognosy, or, to apply a broader term, pharmaceutical botany.

The pharmacist of to-day buys his drugs in the ground or powdered condition, when formerly he purchased them in the original condition and ground them himself, and still previous to that time he collected many of them with his own hands. In testimony of this fact we have only to consult some of the earlier works on pharmacy, where pharmaceutical calendars will be found, each separate month containing a list of the plants in flower, a list of the plants which are to be collected, and a list of the preparations which can be prepared most advantageously at that particular period of the year.

It may prove interesting as well as instructive to quote, from one of these works, these lists for one of the twelve months, as many pharmacists of to-day are so busy with their efforts to keep up with the times that they have but little time to devote to the study of former conditions.

In "Strumpf's Allgemeine Pharmakopœ," published in Leipzig in 1861, such a calendar is given for use in Germany, but it will illus-

trate the subject just as well for the purpose. The list for the month of August is, in part, as follows :

PLANTS WHICH BLOOM DURING AUGUST.

Althæa officinalis,
Artemisia Absinthium,
Calendula officinalis,
Cannabis sativa,
Capsicum annuum,
Chelidonium majus,
Chenopodium ambrosioides,
Colchicum autumnale,
Conium maculatum,

Hyoscyamus niger,
Inula Helenium,
Lappa bardana,
Marrubium vulgare,
Matricaria Chamomilla,
Melissa officinalis,
Nicotiana Tabacum,
Organum majorana,
Papaver somniferum,



Drug and Herb Vendor and his Stand.

Coriandrum sativum,
Cucurbita pepo,
Datura Stramonium,
Fœniculum officinale,
Gentiana lutea,
Glycyrrhiza glabra,
Humulus Lupulus,

Pimpinella Anisum,
Polygala Senega,
Sapouaria officinalis,
Solanum Dulcamara,
Tanacetum vulgare,
Taraxacum officinale,
Veronica officinalis.

DRUGS WHICH ARE TO BE COLLECTED DURING AUGUST.

Absinthii herba,
Allii bulbus,

Lavandulæ flores,
Lini semina,

Calendulæ flores,	Lobeliæ herba,
Capsici annui fructus,	Nicotianæ herba,
Carvi fructus,	Origani herba,
Chenopodii herba,	Papaveris capita,
Conii fructus,	Phytolaccæ fructus,
Coriandri fructus,	Quercus glandes,
Fœniculi fructus,	Sambuci fructus,
Horder fructus,	Sinapis semina,
Hyoscyami semina,	Tanacetii herba cum floribus,
Juglandis cortex viridis,	Veratri albi cormus.

ANIMAL DRUG TO BE COLLECTED DURING AUGUST.

Formicæ.

PREPARATIONS TO BE MADE DURING AUGUST.

Extractum elaterii,	Succus juniperi,
“ gratiolæ,	“ sambuci,
Oleum majoranæ,	Syrupus mororum,
Succus dauci,	“ rubi idæi.

The foregoing list would indicate that the pharmacist, or, to use a more applicable term, druggist, at that period had no easy time of it, as it was almost impossible to buy preparations already made and the completeness of his stock was dependent upon the druggist's personal efforts to a great extent. But conditions have changed and at the present time this comprehensive knowledge of drugs and their seasons has almost entirely disappeared from the profession of pharmacy. It has not died out altogether, however, for the collectors of herbs and simples in many rural communities still possess the knowledge of indigenous drugs that was at one time a necessary branch of pharmaceutical education.

This altered condition of affairs has been detrimental to the profession in some respects, as many pharmacists have even forgotten the appearance of the crude drugs from which their preparations are manufactured; but the present tendency toward the standardization of preparations involves careful determination of the genuine character of the drugs used, and this knowledge of crude drugs may, of necessity, be restored to the profession of pharmacy, where it undoubtedly belongs. The question of economy has also a prominent bearing upon this subject, as most drugs are now sold at a price which would render it extremely unprofitable for the pharmacist to collect his own drugs as in former times, but there is no reason whatever why we, as pharmacists, should not be familiar with the

appearance of those official plants which grow almost at our very doorsteps, for it undoubtedly lends interest to an otherwise dry subject.

There are few pharmacists in this city who are aware of the fact that more than 75 per cent. of the official drugs are growing within a radius of a few miles of Philadelphia, but such is the case; and, what will be still more surprising to many persons, more than 50 per cent. of the official drugs are offered for sale on the street corners by persons who earn a living by collecting them and preparing them for sale. These persons are perfectly familiar with the season



Bundles of Herbs and Drugs as sold by the Street Vendors.

and habitat of each drug and are acquainted with the medicinal uses of every drug collected by them.

The subject of drug vendors and their wares has received little attention by pharmaceutical writers, but it was a subject in which the late Professor Henry Trimble was deeply interested, and it was at his suggestion that the writer of this paper began collecting notes on the subject several years ago.

The large amount of miscellaneous information which was obtained made the task of compilation very difficult, but while the subject has by no means been exhausted, it has been thought best to present

the material already obtained, though the author must confess his inability to handle the subject in the way that it deserves.

The persons who earn a livelihood by collecting and selling drugs are in nearly all cases colored people who live in New Jersey. The localities from which they come embrace the whole of Camden and Gloucester Counties. The flora of this section is of exceptional variety, as there are a number of large tide-water creeks, among which may be mentioned Pensauken, Cooper's, Newton, Big Timber, Little Timber, Woodbury and Mantua Creeks.

These people also gather wild flowers and ferns in their appropriate seasons, and at the holiday season they add holly, mistletoe and laurel to their stock in trade. The flowers, ferns and evergreens are the most conspicuous items of their stock, arranged usually on several boxes or barrels which serve as counters, and many persons who pass them daily are unaware of the fact that each vendor has an assortment of roots, barks and herbs, all of excellent quality and each tied up in packages, which retail for 5 cents. These packages usually average from 2 to 4 ounces in weight, the price therefore being higher than the drugs purchased in the market. The quality, however, is exceptional, and for display specimens or for microscopic work no better source of supply could be found.

The subject has been divided into three parts, namely: (1) official drugs; (2) unofficial drugs; (3) miscellaneous flowers and fruits.

The following list enumerates those official drugs which form part of the regular stock in trade, or which will be collected for persons who wish to purchase them:

Absinthium,	Matricaria,
Allium,	Melissa,
Althæa,	Mentha piperita,
Asclepias,	Mentha viridis,
Aspidium,	Pepo,
Calamus,	Phytolacca fructus,
Castanea,	" radix,
Chenopodium,	Podophyllum,
Chimaphila,	Prunus virginiana,
Cimicifuga,	Quercus alba,
Convallaria,	Rubus,
Cypripedium,	Rumex,
Euonymus,	Salvia,
Eupatorium,	Sambucus,
Geranium,	Sanguinaria,

Hamamelis,	Sassafras,
Hedeoma,	" medulla,
Inula,	Scutellaria,
Iris,	Stramonium,
Juglans,	Tanacetum,
Juniperus,	Taraxacum,
Lappa,	Ulmus,
Lobelia,	Veratrum viride,
Marrubium,	Xanthoxylum.

Among this number are some, such as absinthium, salvia, etc., which do not grow wild, but which are cultivated by these people.

There are some other official drugs which grow in this locality concerning which no information could be obtained, viz.:

Apocynum,	Spigelia,
Caulophyllum,	Triticum,
Chelidonium,	Viburnum opulus,
Dulcamara,	" prunifolium,
Leptandra,	Zea.
*Serpentaria,	

The lack of information concerning some of these drugs may be due to the fact that they have names for them which are not generally known; indeed, the confusion of common names was one of the difficulties encountered in making inquiries about certain drugs, and it would be an interesting subject for some one to take up. Another reason for some of these drugs not being known is probably due to the fact that these people live in New Jersey, and the plants, while common on the Pennsylvania side of the Delaware, are rarely met with on the New Jersey side.

The fact remains that, out of sixty-nine official drugs concerning which inquiries were made, forty-seven were obtainable.

(2) Of the unofficial drugs, the following list comprises all those of which positive information was obtained:

Angelica,	Partridge berry,
Balmomy,	Pennyroyal,
Balm of Gilead buds (balsam poplar buds),	Plantain,
Basil,	Prickly pear,
Bugleweed,	Ragweed,
Burdock,	Queen of the meadow,
Catnip,	Sarsaparilla,
Cleavers,	Smartweed,
	Speedwell,

*This was reported as having been exterminated in this locality by collectors.

Comfrey,	Spice bush,
Coltsfoot,	Spikenard,
Fivefinger,	Sour gum,
Fleabane,	Stone root,
Hawkweed,	Sweet birch,
Heal all,	“ cicely,
Hogweed,	“ clover,
Hop clover,	“ fern,
Horsemint,	“ gum,
Horsenettle,	“ marjoram,
Ironweed,	Toad flax,
Johnswort,	Touch-me-not,
Life everlasting,	Verbena,
“ root,	White snakeroot,
Liverwort,	Wild ginger,
Meadow rue,	“ indigo,
Motherwort,	Wintergreen,
Mullein,	Yarrow.
Parsley herb,	

(3) Miscellaneous flowers, fruits and edible herbs:

Asters,	Lamb lettuce,
Azalea,	Laurel,
Black-eyed Susan,	Lilac,
Buttercups,	Lupine,
Christmas fern,	Magnolia,
Clematis,	Maiden-hair fern,
Columbine,	Marsh marigold,
Crab-apple blossom,	Mock orange,
Daisies,	Mountain pink,
Dandelion,	Persimmon,
Day lily,	Pitcher plant,
Dogtooth violet (adder tongue),	Pond lily,
Flowering moss,	Rabbit-foot clover,
Fringed gentian,	Rhododendron,
Golden rod,	Rosemallow,
Hartford fern,	Tiger lily,
Holly,	Trailing arbutus,
Honey locust,	Trumpet flower,
Honeysuckle,	Violets,
Horseradish,	Watercress,
Hydrangea,	Wild plum,
Ladies' slipper,	“ rose.

Of course, it must be remembered that but few of these articles are obtainable at any one time, but the list for the entire year is surprisingly large. No single one of these vendors was found who was able to procure all of these, as their stock varies

according to the locality from which they come. The work of collecting the material for this paper has been of great interest, and photographs and specimens were obtained, which are herewith submitted.

35 POPLAR STREET, PHILADELPHIA.

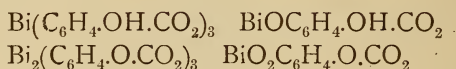
BISMUTH SALICYLATE, BASIC.

BY LYMAN F. KEBLER.

Research Committee E, Pharmacopœia Revision.

Since the introduction of bismuth salicylate, by Dr. Desplat,¹ as a remedy for the treatment of typhoid fever, continued efforts have been made to bring this remedy prominently before the medical profession. And these efforts have met with some success, in that several of the later editions of the various pharmacopœias have recognized the basic salt and considerable quantities of it are being used at present.

Salicylic acid being both acid and phenolic in character, it is possible to prepare two series of salts, the most important having the following composition:



The product, however, commonly employed is the basic salt, in which the phenolic function of the salicylic acid remains intact. This article, theoretically, contains 62.15 per cent. of BiO or 64.356 per cent. of Bi₂O₃, after ignition.

A number of workers have, on several occasions, shown that the article of commerce varies very materially. To what extent this is true at present can readily be seen by a glance at the table below. That bismuth subsalicylate varies somewhat in composition is naturally to be expected, and the various pharmacopœias have recognized this fact by allowing a reasonable variation in the percentage content of bismuth oxide.

The variation in composition of bismuth subsalicylate is due to the proneness of the compound to decompose, in the course of its manufacture, which seems to be a common property of many of the basic bismuth salts. The United States Pharmacopœial Com-

¹1883, *Medical Record*, Aug., II.

mittee of Revision even deemed it undesirable to give a formula for such old and well-established bismuth compounds as bismuth subnitrate and subcarbonate. Nor did it prescribe any limits as to how much or how little bismuth these articles should contain. And in view of some recent investigations, this course has been a most commendable one. According to the commonly accepted formula, bismuth subnitrate should leave on ignition 76.413 per cent. of Bi_2O_3 , but C. O. Curtman¹ found it to vary from 81.10 to 85.00 per cent., and the writer² found it to contain from 81.00 to 83.26 per cent.; and the per cent. of nitric acid varied very markedly. If, therefore, the compound $\text{BiONO}_3 \cdot \text{H}_2\text{O}$ exists, it is so unstable and difficult to prepare that not a single manufacturer is able to supply it. The same is true of the subcarbonate of bismuth.

The argument has been advanced that a variation in the composition of the basic salicylate causes a variation in therapeutic effect. This has probably resulted from a confusion between the so-called normal and the basic articles. For such an argument, considering the quality of bismuth subsalicylate now supplied, in the writer's opinion, is hardly as tenable as it would be with either the subnitrate or subcarbonate.

Basic bismuth salicylate is slowly decomposed by water, alcohol, glycerin, syrups, etc. An aqueous solution of sugar causes more rapid decomposition than plain water. This is probably due to the fact that salicylic acid is more readily soluble in a saccharine menstruum than in water. It would, therefore, appear that this bismuth salt must be considered as a molecular compound of bismuth oxide and salicylic acid, rather than a true salt.

From the above considerations it would not be surprising to find that the commercial article varied considerably, and in order to ascertain to what extent this is true, samples were secured from various sources and examined with the following results:

¹ 1896, *Pharm. Era*, 15, 43.

² 1896, AM. JOUR. PHARM., 68, 422.

No.	Microscopical Appearance.	Physical Appearance.	Per Cent. of Bi_2O_3 .	Reaction.	Moisture, Per Cent. of.	Nitrates.
1 . . .	{ Crystalline and amorphous.	White and bulky. }	63'51	Acid.	0'37	Trace.
2 . . .	{ Crystalline and amorphous.	Bulky, with pinkish tint. }	64'15	"	0'15	"
3 . . .	{ Crystalline and amorphous.	Pinkish tint. }	66'20	"	0'60	Much.
4 . . .	{ Crystalline and amorphous.	White and bulky. }	64'36	"	0'65	"
5 . . .	{ Crystalline and amorphous.	White and bulky. }	64'50	"	0'53	Trace.
6 . . .	{ Crystalline and amorphous.	White and bulky. }	63'42	"	0'20	"
7 . . .	{ Crystalline and amorphous.	White and bulky. }	61'60	"	0'76	"

All contained a trace of chlorides.

The bismuth oxide was estimated in the usual manner.

Neither the metallic copper test of the British Pharmacopœia, '98, nor the test recommended by the German Pharmacopœia, III, for detecting nitrates, have given the writer satisfactory results. In fact, small quantities of added nitrates could not be detected by these methods. The best method found for this purpose, thus far, is the indigo test, which is applied as follows: mix 0.5 gramme of the salicylate with 3 c.c. of concentrated sulphuric acid; a reddish coloration will result, the intensity depending on the amount of nitrate present; to this solution add 4 drops of indigo, T.S., and if much nitrate is present the bluish color will gradually disappear at the ordinary temperature. A small amount of nitrate will rapidly destroy the color on warming.

L. Wolff¹ distinguishes the subsalicylate from the subnitrate by means of the microscope; the former being amorphous or granular while the latter is crystalline. This is neither a satisfactory test for the one nor the other, because the subnitrate may be amorphous and the subsalicylate is, for the greater part, crystalline.

Chlorides and sulphates may be detected by igniting 1 gramme of bismuth subsalicylate in a porcelain crucible, taking up the residue in pure nitric acid, diluting to 20 c.c. with water, carefully avoiding turbidity, neither barium chloride nor silver nitrate should produce more than a faint opalescence.

¹ 1883, AM. JOUR. PHARM., 55, 554.

The British Pharmacopœia requires that alcohol in which bismuth subsalicylate has been shaken should not be colored on adding a few drops of iron chloride, absence of free salicylic acid.

As has been stated above, alcohol decomposes bismuth subsalicylate, consequently this test is too rigid.

Only traces of arsenic were detected by Marsh's test.

Bismuth subsalicylate is a white or pinkish-white, micro-crystalline-amorphous powder, nearly odorless and tasteless, insoluble in water, alcohol and glycerin, but is slowly decomposed by these liquids. On igniting 1 gramme in a porcelain crucible, from 0.62 to 0.64 gramme of residue should be left, corresponding to 62 to 64 per cent. of bismuth oxide. Not more than traces of chlorides, sulphates, nitrates or arsenic should be revealed when tested according to the above-described methods.

SYRUPUS AURANTII.

BY F. W. HAUSSMANN.

The desire for a less complicated process for preparing syrup of orange than the one directed by the Pharmacopœia has repeatedly been expressed.

The method of macerating the shredded peel in boiling alcohol appears to have few advocates.

The advantage of rapid manipulation, the evident object of the Pharmacopœia, is opposed by the liability of dissipating a portion of the volatile oil and consequently impairing the aroma of the syrup.

The official formula has been variously modified, concentrated tinctures, essences and infusions have been proposed, and the different suggestions range from simple admixture of the extracts with syrup to other more complicated methods.

Of these, the recommendation, based chiefly on the fact that the official title, *Syrupus Aurantii*, did not necessarily imply syrup prepared directly from the peel, to employ an alcoholic solution of the oil, deserves attention.

A formula, which directs the syrup to be made from spirit of orange, appears to possess desirable qualities, easy and rapid manipulation and a pleasant odor and taste for the preparation.

Syrups prepared directly from the oil, however, almost invariably acquire a terebinthinate odor on standing.

A syrup possessing the agreeable properties of orange must be

prepared from the peel subjected to extraction with alcohol in the cold.

This is the principle upon which the formulas of the 1870 and 1880 Pharmacopœias are based.

It appears, however, that the percentage of alcohol retained in the present syrup is excessive, and a more satisfactory preparation is obtained if the alcohol is partly allowed to evaporate.

A syrup of less spirituous flavor is thereby produced.

The following formula is based upon this principle, with retention of the precipitated calcium phosphate as medium for filtration :

SYRUPUS AURANTII.

Sweet orange peel, taken from the fresh fruit	50 grammes.
Precipitated calcium phosphate	50 “
Sugar	750 “
Alcohol } Water }	of each a sufficient quantity to make 1,000 c.c.

Macerate the sweet orange peel, which should be as free as possible from the white inner layer, and grated, in 100 c.c. of alcohol during twenty-four hours.

Pour the mixture into a narrow percolator, allow the alcoholic extract to drain, and continue the percolation with small portions of alcohol until 100 c.c. of percolate have been obtained.

Mix the precipitated calcium phosphate in a mortar with 150 grammes of sugar and add the tincture with constant trituration.

Set the mixture aside in a moderately warm place until the greater portion of the alcohol has evaporated.

To the residue add 300 c.c. of water, transfer the whole to a filter and return the first portions of the filtrate, if necessary, until it runs clear.

In the filtrate dissolve the remainder of the sugar by agitation without heat, and add a sufficient quantity of water to make the product measure 1,000 c.c. Strain if necessary.

While conducting the above experiments, magnesium carbonate was substituted for precipitated calcium phosphate in a number of instances.

The syrup, prepared by filtration through magnesia, possesses a more attractive appearance, has a brilliant color and pleasant odor and taste.

The writer regards it as superior to syrup prepared by filtration through calcium phosphate.

SYRUPUS PRUNI VIRGINIANÆ.

BY F. W. HAUSSMANN.

The original researches upon syrup of wild cherry were conducted with the view of determining the proper amount of glycerin to be added to insure stability.

The quantity directed by the Pharmacopœia, 15 per cent. by volume, appears to be excessive, and in the course of the various determinations it was found that syrups containing 10 or even 5 per cent. of glycerin, with a corresponding increase of sugar, possess equal stability compared to the official preparation.

Entire omission of glycerin is not to be recommended, however, as it undoubtedly prevents precipitation in both syrup and infusion to a marked degree.

Syrup of wild cherry, with glycerin additions ranging from 3 to 15 per cent. by volume, will, however, invariably show a flocculent deposit on standing, but the volume of the precipitate is considerably increased in specimens to which no glycerin has been added.

The preserving action of the latter is shown to advantage in wild cherry infusions, as simple aqueous percolates deteriorate more rapidly.

Judging from the results of a number of trials, the writer is convinced of the necessity of the presence of glycerin in the syrup.

The proper time at which it is to be added received some attention.

The conclusion to make glycerin a part of the percolating menstruum was arrived at after a number of trials.

This is especially necessary in summer, as a slowly percolating infusion, even if allowed to drop upon glycerin, will rapidly turn cloudy.

The observation was repeatedly made in percolates from identical specimens of bark that with the increase of glycerin the infusion was correspondingly darker.

If the present official process is to be retained, the writer would recommend the reduction of the amount of glycerin to one-half, 75 c.c. to 1,000 c.c. of finished syrup, to make the same a part of the menstruum and to increase the amount of sugar from 700 to 750 grammes.

ACETOUS SYRUP OF WILD CHERRY.

The idea of employing a weak acetic acid menstruum in preparing syrup of wild cherry was not entertained until the possibility of its advantages was pointed out by Prof. Jos. P. Remington.

Opinions on the advisability of using acetic acid as menstruum are frequently voiced at present, and objections to this innovation are as usual vigorously recorded.

The employment of weak acetic acid in the preparation of syrups, besides those of garlic and squill, would not be an innovation in the Pharmacopœia, as a precedent is established in the case of syrup of ipecacuanha, and probably no pharmacist will return to the old method of preparing the syrup by admixture of fluid extract and syrup.

The writer admits that at the beginning he employed acetic acid in preparing wild cherry syrup with considerable reserve, if not prejudice, but as the acid percentage was decreased, the respect for the menstruum increased, and it was found that a preparation containing 1 or 2 per cent. of acetic acid furnished an excellent substitute for the official article.

As in the case of the latter, a number of trials were made to determine the proper amount of glycerin. Syrup containing 10 per cent. of glycerin and made with a 1 or 2 per cent. acetic acid menstruum was found to give the best satisfaction.

Employed to a limited degree in counter and dispensing practice, no objection has as yet been heard, and the pleasant acidulous taste is apparently an advantage from a mercantile standpoint.

The following is the formula for syrup prepared with a menstruum containing 1 per cent. of acetic acid:

Wild cherry, in No. 20 powder	150 grammes.
Sugar	750 "
Glycerin	100 c.c.
Diluted acetic acid } Water }	of each a sufficient quantity to make 1,000 c.c.

Mix the glycerin with 300 c.c. of a mixture composed of 1 part of diluted acetic acid and 5 parts of water.

Moisten the wild cherry with a sufficient quantity of the liquid and macerate for twenty-four hours in a closed vessel, then pack it firmly in a cylindrical percolator and pour on the remainder of the menstruum. When the liquid has disappeared from the surface,

follow it by a mixture of diluted acetic acid and water in the same proportion as before, until the percolate measures 450 c.c.

Dissolve the sugar in the percolate by agitation without heat, strain and pass a sufficient quantity of the same acid mixture as before through the strainer to make the product measure 1,000 c.c. Mix thoroughly.

SYRUPUS ROSÆ.

BY F. W. HAUSSMANN.

This agreeable mildly astringent syrup is deserving of more frequent use.

It is prepared according to the Pharmacopœia by admixture of fluid extract of rose and simple syrup, which process, as the syrup is intended to be prepared extemporaneously, is satisfactory for ordinary purposes.

Syrup of rose is somewhat cloudy when thus prepared and shows a deposit on standing, the usual result of mixing fluid extracts with syrup. Should the syrup be required to be kept on hand for a time, the following formula yields a clear and bright syrup.

SYRUPUS ROSÆ.

Fluid extract of rose	125 c.c.
Diluted sulphuric acid	10 "
Sugar	750 grammes.
Water, a sufficient quantity to make 1,000 c.c.	

Mix the fluid extract of rose with 300 c.c. of water, previously mixed with the diluted sulphuric acid.

Allow the mixture to stand for two hours, filter, and in the filtrate dissolve the sugar by agitation without heat, and strain.

Finally add a sufficient quantity of water through the strainer to make the syrup measure 1,000 c.c.

Mix thoroughly.

The advantages of adding diluted sulphuric acid are the production of a brighter colored syrup, an agreeable acidulous taste and possibly an increase in astringency.

The disadvantage, however, is the liability of the inversion of the sugar and consequent deposit of grape sugar on prolonged standing.

NOTES ON BEESWAX.

BY H. V. ARNY.

To the writer was submitted a sample of yellow wax for examination; the client—a pharmacist—having purchased a large stock and becoming suspicious of presence of resin (rosin). It was true that the specific gravity was found to be within the limits prescribed for pure wax, but the product behaved peculiarly under the U.S.P. test for resin, and—oh, rule of thumb!—*it tasted like rosin!* Before making claim of reparation, however, the pharmacist appealed to the writer for his opinion. The sample was of clear, good color, of the correct odor, but, on chewing, it did leave an acrid taste, suggestive of resin, U.S.P. Its specific gravity by immersion method at 20° C. was 0.9488; by Hager's method at 25° C. it was 0.9456. It melted at 64°–65° C., all the data affirming the purity of the wax.

Tested by pharmacopœial methods, it showed no traces of paraffin nor soap, and, emitting no acrolein vapors, contained no fats. At the resin test, however, a halt was necessary, since, when boiling 1 gramme wax with 35 c.c. of a 15 per cent. solution of soda, the filtrate yielded a precipitate with hydrochloric acid—a precipitate that had led the client astray. It was faint and flocculent, and struck a practised eye as something other than rosin; hence other resin tests were applied.

Five grammes wax, treated with cold alcohol, yielded 0.1441 gramme residue on evaporation of the alcoholic filtrate, or 2.88 per cent., but a trifle over the alcohol soluble part (2.4 per cent.) of pure wax. Again, Allen's test for resin—nitric acid and ammonium hydrate—gave only a yellow color, showing conclusively the absence of resin.

The precipitate by the U.S.P. resin test was evidently not caused by resin, and its flocculence suggested that it was merely cellulose dissolved from the filter paper by the 15 per cent. solution of soda. Accordingly the test was repeated with the liquid that had been filtered through sand, and such a filtrate produced no precipitate with hydrochloric acid, showing clearly that the precipitate in the first-named case was cellulose, rather than abietinic acid.

It is therefore advisable that, in the next Pharmacopœia, the text of this test be amended to read "no precipitate should be produced in the liquid *after filtration through glass-wool or asbestos*, by hydro-

chloric acid," etc.; for the natural interpretation of the present test is filtration through paper.

Does not such an experience as the one above cited suggest the advisability of giving, whenever possible, in the next Pharmacopœia two tests for the same impurity? A practicing chemist is rarely content to make an assertion based on one experiment, and usually confirms his first result by a second method. Such confirmatory tests he searches out in his library; but the average druggist does not usually possess a large collection of works of reference. Of course he should, but he does not, and, since the Pharmacopœia is intended as his work of reference *par excellence*, it should supply his lack of books as far as possible.

Further examination of the wax showed that its acid and ester numbers (see *Proc. A. Ph. A.*, XLVI, 883) were within the limits assigned pure beeswax, the acid number being 19.2 in one estimation and 20 in a second, while the ester number was 75.2 in the first trial and 75.4 in the second. An estimation of the iodine number (see *Proc. A. Ph. A.*, XLV, 680) was prevented by the illness of the writer.

During the examinations here mentioned, efforts were made to isolate the principle giving the wax its rosin-like taste. Boiling with water a half hour and extraction of the filtrate with ether yielded a trace of sticky residue, which was intensely bitter. This suspicious product was evidently an accidental impurity transmitted to the wax by the bee.

Not only has illness put a stop to the work, but, by a curious fatality, the death of the client has put the tracing of the source of the suspected wax beyond the power of the writer—thanks to unfortunate procrastination.

The bitter principle is worthy of further investigation, and any information that leads to securing a new supply of the product will be gratefully received.

COVINGTON, LA., December, 1899.

RECENT LITERATURE RELATING TO PHARMACY.

DETECTION OF SHIKIMI FRUIT IN STAR ANISE.

Several proposed methods of distinguishing between these closely similar fruit have been critically tried by Dr. W. Lenz (*Schw. Wochenschr. für Chem. und Pharm.*, 1899, 45), who used in his in-

vestigation eight authentic samples of star anise and ten of shikimi. The processes employed were: (1) Tschirch and Oæsterle's, which is based on the differing behavior of alcoholic extracts of the two fruits when poured into water—a method criticised by von Vogl; (2) difference in size and appearance of the aleuron grains found in the seed; (3) Collin's method, based on presence of numerous and large sclerenchyma cells in the stipe of star anise and comparative absence of same in the stipe of shikimi.

The writer finds the last two methods practically useless, while Tschirch's is both practical and accurate. He finds little ground for von Vogl's strictures and entirely eliminates cause for same in the following modification of the process:

One carpel of the suspected fruit is boiled in a test-tube for two minutes with 5 c.c. 95 per cent. alcohol. The cold liquid (which has lost about 1 c.c. in cooking) is filtered and the filtrate treated with four or five times its bulk of water. If the fruit was star anise, the liquid invariably becomes cloudy (due to anethol), while a shikimi extract remains clear.

When the clear diluted shikimi extract is shaken with petroleum ether (boiling under 60° C.) and separated, the ethereal layer leaves scarcely any residue on evaporation, and that trace has a disagreeable odor.

The cloudy star anise extract, on the other hand, when similarly treated, yields an ethereal layer which, on evaporation, leaves a yellow oily residue of anise odor. Efforts to obtain from this residue microscopic crystals of di-brom-anethol, or di-iso-nitroso-anethol-peroxide, were futile, but the presence of anethol was readily proven by the spectroscope.

H. V. A.

MICROSCOPICAL IDENTIFICATION OF THE MYDRIATIC ALKALOIDS.

A study of the alkaloids of the Solanaceæ is reported by S. Vreven (*Ann. de Pharm.*, Louvain, 1899, 1). It is based on the microscopic examination of the precipitates of these alkaloids with the well-known reagents: compound solution of iodine, potassio-bismuthic iodide, potassio-mercuric iodide, phospho-tungstic acid, phospho-molybdic acid, gold chloride, platinic chloride, potassio-cadmic iodide and picric acid. Of these, the two last enumerated are the only ones giving crystals of sufficient individuality to be of value in identification, and these yield highly satisfactory results,

even when the alkaloids were mixed with decomposing urine. For mixtures of several alkaloids, the process is poorly adapted, crystals from such mixtures having vague outlines. For the characteristic crystalline forms of the several precipitates, the reader is referred to the illustrations in the original article.

The writer finds that the fusing point of the potassio-cadmic iodide precipitates of the several alkaloids is a valuable aid to identity. The atropine precipitate melts at 95°C ., the hyoscyamine, daturine and duboisine precipitates all melt at $86^{\circ}\text{--}87^{\circ}\text{C}$.. This leads him to consider the last three alkaloids as identical.

H. V. A.

THE OXIDIZING FERMENTS OF ACONITE AND BELLADONNA.

E. Lepinois (*J. de Pharm. et de Chim.*, 1899, 49) reports a microscopical and chemical study of the ferments found in aconite and belladonna. His microscopical investigation consisted in treating sections of drugs with tincture of guaiac both before and after immersion in 90 per cent. alcohol. The oxidizing matter naturally gave a blue coloration with the guaiac and thus the location of the ferment was readily determined, and was found only in parenchyma, chiefly in living cells. None whatever was found in the fibrovascular bundles.

That the ferment was a constituent of the juice of plants was shown by these coloring blue with tincture of guaiac and blackening with solutions of resorcin, hydroquinone and pyrogallol. Such reactions failed with juices that had been heated to 100°C .

To prove that this oxidizing ferment performs its functions as an absorber of oxygen from the air, the writer placed a mixture of oxidizable matter (usually hydroquinone) and the juice in a flask, through the cork of which was passed a sealed glass tube. Such a flask was allowed to stand twenty-four hours in some cases, and two to three days in others. Then the point of the tube was broken under water, when the liquid passed in to occupy space left by absorbed air. Results showed that in a flask of 250 c.c. capacity, holding 20 c.c. juice and 50 c.c. of the hydroquinone solution, the absorption of gas ranged from 5 to 15 c.c. On the other hand, when boiled juice was employed, no absorption was noted.

Efforts made toward a quantitative estimation of absorbed oxygen and evolved carbonic oxide merely proved that such a reaction does occur.

Attempts at isolation of the ferment were scarcely successful, the product being almost void of oxidizing properties, showing that the boiling alcohol used in extraction destroyed the activity of the ferment. The ash of these products from both drugs were examined. That from aconite contained iron and scarcely any manganese; while in the belladonna product manganese predominated. This variant composition still leaves unsettled the question whether the oxidation by such ferments is controlled by manganese.

H. V. A.

PICROTOXIN.

The chemical literature touching this official is filled with conflicting statements, some investigators claiming it is a definite chemical compound—citing its constant melting point (199° – 200° C.) as proof—while others insist it consists of two bodies. This view is held by Meyer and Bruger (*Ber. d. Deutsch. Chem. Ges.*, 31, 2958), who have separated the two bodies, calling them picrotoxinin and picrotin. The separation is accomplished with boiling chloroform, in which picrotoxinin dissolves with only traces of picrotin. Better, however, is the separation by treatment of picrotoxin with bromine, when a crystalline monobromo-derivative of picrotoxinin is formed, while the picrotin is unaffected. This method of separation is quantitative and shows that commercial picrotoxin consists of 54 per cent. picrotoxinin and 46 per cent. picrotin. The crystallization from a solution containing this proportion of the two substances yields a product identical with the official.

Picrotoxinin is obtained from the mono-bromo derivative by cooking with zinc dust and acetic acid. It crystallizes from acetic acid in fine colorless needles of melting-point 200 – 201° C., and gives orange-red coloration with concentrated sulphuric acid. Gaseous hydrochloric acid passed through its ethereal solution produces a polymere, picrotoxid, which melts at 308 – 310° C. Picrotoxinin reduces Fehling's solution on warming, is very bitter, and is the active physiological principle of picrotoxin. Its formula is $C_{15}H_{16}O_6$. Picrotin, $C_{15}H_{18}O_7$, crystallizes from hot water in white woolly crystals, melting at 248 – 250° C. It yields mono- and dibenzoyl derivatives and a nitro body. It is but slightly affected by alkalis and by potassium permanganate or bichromate.

H. V. A.

OIL OF THYME.

Understanding that oil of thyme was often falsified by addition of oil of turpentine and abstraction of its natural phenols, thymol and carvacrol, M. Duyk (*Fourn. de Pharm. d'Anvers*, 1899, 41) investigated the substance, and found that, in many cases, the charge was true. Concerning the addition of turpentine, he learned from eye-witnesses that in the crude process of distillation employed by the peasants in the south of France it is usual to place in the bottom of the still body a layer of pine and fir branches, and thereon the herb is laid, the excuse being that the pine needles keep the thyme from scorching.

The writer critically compared the pharmacopœial tests, working with absolutely samples of the oil, and he decides that the best oil is yielded by cultivated thyme (*T. vulgaris*), and that such a product contains no pinene, and yields at least 20 per cent. of thymol and carvacrol. Such an oil will dissolve in its own volume of 84 per cent. alcohol, will boil at not less than 170° C., and will be inactive or slightly laevogyre toward polarized light. After removal of thymol and carvacrol with solution of soda, the residue will be slightly dextrogyre. The oil will have the density of not less than 0.885, and gives negative results with the refractometer. If to 1 c.c. oil and 4 c.c. liquid paraffin be added 2 c.c. sulphuric acid, specific gravity 1.86, of the same temperature, the rise in temperature on mixing will not be greater than 18° C.

H. V. A.

ANABSINTHIN.

Adrian and Trillat have continued their researches (*Nouv. Rem.*, 1899, 93) on absinthium. They scout the idea that their body is absinthin, citing that their compound, which they call anabsinthin, differs from absinthin by being insoluble in ether and by its higher fusing-point (258–260° C.). Moreover, its formula is $C_{18}H_{24}O_4$. It is extracted by treating absinthium with 85 per cent. alcohol, evaporating extract, treating residue with chloroform, filtering and evaporating chloroformic extract, which is then dissolved in 90 per cent. alcohol. This solution is freed from extraneous matter by addition of lead acetate, the lead removed with tartaric acid and the filtered liquid evaporated. From this residue the anabsinthin is extracted with benzin and purified by crystallization from alcohol. It is a crystalline, intensely bitter substance, which gives a color reaction

with sulphuric acid, and neither reduces Fehling's solution nor forms a phenyl hydrazine compound. From the benzin left on removal of the anabsinthin the writers obtained another body in the form of yellow needles, melting at 165° C., and showing on combustion the formula $C_{52}H_{51}O_{20}$.

H. V. A.

FABIANA IMBRICATA.

To the knowledge of Pichi Dr. H. Kunz-Krause (*Arch. der Pharm.*, 1899, 1) has made a valuable contribution, taking up the subject where left by Trimble, Schroeder and Deitz (*JOURNAL*, 1889, p. 405, *et seq.*), confirming their work and entering into minutiae.

An infusion of the leaves showed a considerable quantity of magnesium phosphate, a tannin which he calls Fabiana-tannoid, a fluorescent substance proven to be chrysotropic acid (oxy-methyl cumarol, β methyl æsculetin), while no alkaloids are present, the sole basic principle being choline. The leaves also contain a soft resin, which yields, on heating to 100° C. with diluted acid, a volatile oil, Fabiana tannoid, chrysotropic acid and an inactive sugar.

The ethereal extract from the infused leaves contained chlorophyll, chrysotropic acid, the volatile oil "Fabianol" (which analyzed to $C_{50}H_{90}O_4$, boiled at 275° C., and had refractive value 1.5076) and Fabiana-resin, which appeared in microscopical crystals, melting at 280° C. The wood yielded chrysotropic acid and choline.

These preliminary observations were followed by a careful study of the several characteristic bodies.

The resin yielded two bromine derivatives, one colorless, of formula $C_{18}H_{28}Br_2O_2$, and one that was yellow and of variable composition. It also yields a mono-acetyl and a mono-benzoyl derivative and gives negative results to the methoxyl group test. Hydriodic acid and red phosphorus reduces it to a wax-like substance having the formula $C_{54}H_{98}O_2$. This fact, together with the similarity of the resin to Fabianol, $C_{54}H_{90}O_2$, brings the author to the conclusion that the combustion formula of the resin, $C_{18}H_{30}O_2$, should be trebled. Lastly, the resin, when melted with soda and potassa, oxidizes to a body behaving like vinyl-para methoxyl-pyro-catechin, a point of value in the study of resins.

The tannin proved a glycotannoid, behaving like caffetannic acid, which the author previously showed to be glycosyl dioxy cinamic acid. It yields a bromin product, whose halogen percentage

closely approximates that of di-brom-methoxy-dioxy-cinnamic acid. This is of interest, since the lactone of the latter is chryso-tropic acid, another constituent of pichi.

From analyses of its lead and copper salts the constitution of the tannoid is supposed to be $C_{16}H_{20}O_{10}H_2O$. Direct estimation, as usual with non-crystalline tannoids, does not yield definite results.

H. V. A.

BULGARIAN OPIUM.

S. Hartwich (*Schweiz. Wochenschr. f. Chem. et Pharm.*, 1899, 121) gives an interesting account of the culture of opium in the Balkan region, the data being mostly secured from a former student now engaged in the enterprise. While European Turkey has long produced opium, the culture in Bulgaria dates from 1896, when the wheat culture began declining.

The fields, preferably in level meadows, are plowed two or three times, and are sown between February 20th and March 15th, although some sow in September, risking frost, however, in order to secure hardier plants. When the plants are about 8 centimetres (or 3 inches) high, the field is hoed, thereby removing many of the young plants, leaving only twenty-five to thirty-five remaining to the square metre. Later the field is hoed again to remove weeds. The plants flower in May, and shortly after the flowers fade and the ovary enlarges the collection of the opium begins, the incisions being made in the afternoon and the dried juice scraped from capsule in the morning, just as in Turkey. Care is taken to avoid cutting to the interior of the capsule, in order that the ovary remain sufficiently intact to produce the seed.

The writer gives the planter's actual figures concerning a crop. This shows that a field of 20 dekars (about 5 acres) yielded 25 kilos (55 av. pounds) opium and 1,300 kilos (2,860 av. pounds) seeds, a crop bringing \$304. The outlay for this crop, even including items of rent, taxes and interest, was \$107.20.

Interesting are the figures relating to the cost of labor; for instance, the collection of the 2,860 pounds of seed cost 5.20, while six hoeings of the five-acre field cost \$1.60.

Examination of nine samples of Bulgarian opium showed their morphine strength, estimated for dry opium, ranged from 6.6 per cent. to 20.75 per cent.

H. V. A.

BOILING POINT OF MIXED LIQUIDS.

J. K. Haywood, *J. Phys. Chem.*, 1899, 3, 317.

Previous investigations were carried out by measuring the vapor pressure with varying composition, the temperature being kept constant. The author considered it more profitable to proceed as in actual practice; he, therefore, examined the variation of the boiling point under constant pressure. This method had previously been adopted by Thayer (*J. Phys. Chem.*, 1898, 2, 382; 1899, 3, 36). The apparatus used was essentially that of Orndorff and Cameron (*Am. Chem. J.*, 1895, 17, 517). The materials employed were carefully purified; the thermometer graduated to $\frac{1}{10}$ of a degree was carefully calibrated and all readings are uncorrected. Three diagrams are given. These contain a number of carefully plotted curves, which may be studied with profit, by referring to the original article.

From the results of his investigations the author has drawn the following conclusions:

(1) All mixtures of the following pairs of liquids boil at temperatures between the boiling points of the constituents: alcohol-water, alcohol-ether, chloroform-carbon tetrachloride, acetone-water and acetone-ether.

(2) A solution containing 17.5 per cent. of alcohol in carbon tetrachloride distils without change at 65.5° C., approximately, under 768.4 millimetres pressure.

(3) A solution containing 12.5 per cent. of methyl alcohol in chloroform distils without change at 54° C., approximately, under 770.2 millimetres pressure.

(4) A solution containing from 12-13 per cent. of methyl alcohol in acetone distils without change at 55.9° C., approximately, under 764.8 millimetres pressure.

(5) A solution containing from 15-20 per cent. of carbon tetrachloride in acetone distils without change at a temperature but 0.05° below that of pure acetone, and all mixtures containing more than 40 per cent. of acetone boil within 1° of the boiling point of acetone itself.

(6) The close proximity of the boiling points of the constituents appears to be a favorable condition for the existence of a maximum or a minimum point on the boiling point curve. Similarity of constitution, however, seems to be a strongly modifying condition.

(7) In general, one constituent remaining the same, the mixtures with substances of similar chemical constitution yield similar boiling point curves. One well-marked exception appears: carbon tetrachloride and chloroform in acetone. L. F. KEBLER.

PERMANENCE OF IPECAC PREPARATIONS.

Mr. R. Glode Guyer (1899, *Pharm. Jour.*, 622) assayed a sample of liquid extract of Rio ipecac, and found it to contain only 1.528 per cent. of alkaloids, whereas two months previously the same preparations contained 2.08 per cent. A liquid extract prepared from Carthage root and standardized to assay 2.1 per cent. (age not given) was also assayed, and found to contain 1.525 per cent. These figures show that the liquid extracts of both the Rio and Carthage roots depreciate exactly parallel.

Three samples of wine of ipecac collected from retailers assayed 0.0788, 0.0384, 0.0348 per cent. A similar number from wholesalers contained 0.0882, 0.1022, 0.077 per cent. of total alkaloids. Standard, 0.1 per cent.

The questions suggested by this investigation are: Does the alkaloidal value depreciate by age, or do the alkaloids deposit on standing, and are then removed by subsequent filtration?

NOTE.—In 1897 Mr. C. H. LaWall, this *JOURNAL*, 69, 619, reported on a thirty-three-year-old fluid extract, which contained 2.76 per cent. of total alkaloids.

In assaying, the precipitate was carefully excluded, so that the above per cent. represents only the alkaloids in solution. Recently the abstractor received several samples of fluid extract of ipecac, made by Dr. Squibb, with the information that they were very old, and probably worthless. On the average these samples, after filtering, contained 1.72 per cent. of total alkaloids. L. F. K.

NEW REMEDIES OF 1899.¹

Acetanilid-sulphonate of Sodium.—Soluble antipyretic.

Acetophenone-ortho-oxyquinoline.— $C_9H_6NO \cdot CH_2 \cdot CO \cdot C_6H_5$. Hypnotic and antineuralgic.

Acet-ortho-amido-quinoline.— $C_9H_6N(NHCH_3CO)$. Antipyretic.

Acet-orthotoluid.— $C_6H_4(CH_3)NHCOCH_3$. Orthotolyl-acetamide. Antipyretic. Dose: 0.1–0.3 gramme ($1\frac{1}{2}$ –5 grains).

¹ Merck's Report, 1900, p. 19.

Acet-paratoluid.— $C_6H_4(CH_3)NHCOCH_3$. Paratolyl-acetamide.
Antipyretic. Dose: 1–2 grammes (15–30 grains).

Acetyl ethyl-phenylhydrazine.— $C_{18}H_{22}N_4O_2$. Antipyretic.

Acid, Pipitzahoic.— $C_{30}H_{20}O_6$. Active purgative principle of pipitzahoac. Dose: 0.2–0.3 gramme (3–5 grains).

Acoin.—Dipara-anisyl-monophenetyl-guanidine hydrochlorate. Local anesthetic in eye practice in 0.1 per cent. solution.

Acthol.—Cetyl alcohol. Vehicle in cutaneous affections.

Aghara.—Gaskaral H. Astringent and diuretic. Dose: 30–60 c.c. (1–2 fluid ounces) of 1:20 infusion.

Agoniadin.— $C_{10}H_{14}O_{12}$. Glucoside from bark of *Plumeria succuba*. Used in intermittent fever. Dose: 0.12–0.25 gramme (2–4 grains).

Airogen.—An iodized bismuth compound intended for use as a vulnerary.

Aldunea.—Analgesic.

Alepton, P.—Colloidal ferromanganese peptonate.

Alepton, S.—Colloidal ferromanganese saccharate.

Alkasal.—Aluminium-potassium salicylate. Astringent and antiseptic.

Aluminium Cascinate.—Intestinal astringent. Dose: 0.25–0.3 gramme (4–5 grains).

Aluminium-Potassium Salicylate.—See Alkasal. (*Orthmstedt*)

Amido-acetone-ethyl-disulphone.—Amidosulfonal.

Amidocinnamic-acid Ethyl Ester, Meta.—Properties like those of cinnamic acid; also local anesthetic.

Amidocinnamic-acid Methyl Ester, Meta.—Like the preceding.

Amidosulfonal.—Amido-acetone-ethyl-disulphone. Sedative.

Amyl Nitrite, Carbonated.—See Carbonated Amyl Nitrite.

Anisidine Citrate, Para. (Primary).—Monoanisidine citrate. Antirheumatic and febrifuge.

Annidalin.— $C_6H_8I_2OI$. Triiodophenol. (Not to be confounded with thymol iodide, also known as “annidalin.”)

Antimellin.—Glucoside isolated from the fruit of *Sisygium Fambolanum*. Employed in diabetes.

Antipyrine Tannate.— $C_{11}H_{12}N_2O.C_{14}H_{10}O_9$. Compound containing 37 per cent. antipyrine and used like the latter. Dose: 1.5–3 grammes (24–45 grains); children $\frac{1}{3}$ to $\frac{1}{2}$ as much.

Arsenic Caseinate.—A soluble arsenic compound for internal administration.

Aspidium Spinulosum.—Anthelmintic. Dose: 3-4 grammes (45-60 grains) of extract.

Aspirin.—Acetylsalicylic acid. Succedaneum for sodium salicylate.

Asterol.—Soluble modification of mercury sulphocarbolate (hydrargyrol). Surgical antiseptic and bactericide. *Schaerger's*

Ayapana.—The herb of *Eupatorium triplinerve* (*E. ayapana*), Vall. Tonic and stomachic.

Balatin.—Creamy sap from a South American tree. Used as a skin varnish and vehicle in cutaneous diseases.

Benzoyl Peroxide.—Bactericide and disinfectant.

Bisol.—Soluble bismuth phosphate.

Bromated Phtalimide.— $C_6H_4(CO)_2NBr$. Used in cutaneous affections.

Calliandra Grandiflora.—Reputed antiperiodic.

Calmin.—Compound (?) of antipyrine and heroin used in asthma, etc.

Carbonated Amyl Nitrite.—Amyl nitrite saturated with carbonic oxide. Used like amyl nitrite by inhalation.

Cheiranthin.—Glucoside from leaves and seeds of *Cheiranthus cheiri*. Acts like the digitalis group.

Chiolin—Antiseptic dermic.

Chloralbacide.—Chlorine substitution product of albumin. Tonic in gastric and intestinal affections.

Chloralbacide-sodium.—Compound of chloralbacide and sodium. Used in gastric and intestinal affections. Dose: 1-2 grammes (15-30 grains) before meals.

Chloretone.—Acetone-chloroform; tertiary trichlorbutyl alcohol. Hypnotic and anesthetic.

Chloro-iodolipol.—Disinfectant and antiseptic.

Chlorozone.—Disinfectant and deodorizer.

Cinnamylmetacresol.—Hetocresol.

Collargol.—Colloidal silver. Internal and external antiseptic.

Coriamyrtin.— $C_{30}H_{36}O_{10}$. Glucoside from *Coriaria myrtilifolia*. Cardiac stimulant.

Crenasol.—Antiseptic liquid.

Creosote, Chlorinated.—Antitubercular.

Cupri-aseptol.—Copper sulphocarbolate.

Cuprol.—Copper nucleide. 6 per cent. Cu.

Cystogen.—"Ammonia salt of formaldehyde." Genito-urinary antiseptic.

Diacetphenetid.—



Derivative of phenacetin used like the latter.

Diacetyl para-ethyl-amidophenol.—Monoethylated acetyl-para-amidophenol. Analgesic and narcotic.

Diacetyl-para-methyl-amidophenol.—Monomethylated acetyl-para-amidophenol. Analgesic and narcotic.

Diastol.—An extract of diastase.

Diiodophenol Iodide.—See Phenol diiodide.

Dionin—



Ethyl-morphine hydrochlorate. Readily soluble and efficient succedaneum for morphine, especially in coughs and in the morphine habit. Dose: 0.015–0.06 gramme ($\frac{1}{4}$ –1 grain).

Dithan—Trional.

Dormiol.—Amylene-chloral. Hypnotic. Dose: 0.5–3 grammes (8–45 grains).

Egols.—Compounds of mercury with para-sulphonic acid and a phenol.

Ethyl-phenacetin.— $\text{C}_6\text{H}_4(\text{OC}_2\text{H}_5)\text{N}(\text{C}_2\text{H}_5)\text{CH}_3\text{CO}$. Hypnotic.

Eugenoform.—Sodium salt of eugenolcarbinol. Antiseptic and bactericide. Dose: 0.5–1 gramme (8–15 grains).

Eumenol.—A fluid extract prepared from the Chinese plant tang-kui, kau-kui, wön-row. Efficient emmenagogue.

Febralgene.—Antipyretic.

Fectol.—Disinfectant.

Ferrinol.—Iron nucleide. 6 per cent. Fe.

Fluoroform.—Succedaneum for hydrofluoric acid as spray in aqueous solution in inhalation in tuberculosis.

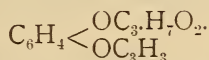
Fluoroform Water.—Aqueous solution of gaseous fluoroform. Used in tuberculosis and lupus. Dose: Teaspoonful four or five times daily.

Formaldehyde-Sulphocarboic Acid.— $2(\text{CH}_2\text{OH})\cdot\text{C}_6\text{H}_3\text{OH}$. Wound antiseptic.

Guaiacol Camphorate.—Antitubercular.

Guaiiform.—Disinfectant.

Guaiamar.—



Guaiacol glyceryl-ester. Succedaneum for guaiacol. Dose: 0.2–1 gramme (3–15 grains).

Hæmoform.—Iron-albumin preparation.

Hæmostat.—Topical application for nosebleed.

Hæmotrophin.—A fluid hemoglobin preparation.

Heroin Hydrochlorate.—Diacetylmorphine hydrochlorate. Succedaneum for morphine.

Hetokresol.—Cinnamyl-meta-cresol. Antitubercular. Used like sodium cinnamate.

Hetol.—Sodium cinnamate. Antitubercular.

Homocresol.—Guaiacol-ethyl; guéthol. Succedaneum for guaiacol.

Hyrgol.—Colloidal mercury.

Iodomuth.— $\text{Bi}_4\text{C}_7\text{H}_7\text{I}_2\text{O}_5$. Siccative antiseptic and alterative. Dose: 0.06–0.6 gramme (1–10 grains).

Iodothymoform.—Iodothymol-formaldehyde. Condensation product of thymol and formaldehyde. Vulnerary and surgical antiseptic.

Iodozen.— $\text{C}_6\text{H}_2\text{I}(\text{COOCH}_3\text{ONa})$. Iodine derivative of methyl salicylate. Antiseptic, discutient, alterative and absorbent.

Kalagua.—Extract prepared from a South American plant. Antitubercular. Dose: 0.2–0.5 gramme (3–8 grains).

Kau-Kui.—See Eumenol.

Kestin.—Antiseptic and deodorant.

Kresoform.—Condensation product of formaldehyde and creosote.

Lanoform.—Compounds of adeps lanæ with formaldehyde used in skin diseases.

Laurotetaninc.— $\text{C}_{19}\text{H}_{23}\text{NO}_3$. Alkaloid from the bark of *Tetranthra citrata*, Nees. Tetanic.

Lipogenin.—Ointment base occurring in solid and liquid form; solvent for iodine for external use.

Lyptol.—Antiseptic ointment base.

Melonemetin.—Bitter principle from melon root. Emetic and purgative. Dose: 0.05–0.07 gramme ($\frac{3}{4}$ –1 $\frac{1}{8}$ grains).

Melon Root.—Substitute for ipecac as an emetic; purgative. Dose:

Of cultivated root, 25 grammes (6 drachms), of wild root, 0.5-0.7 gramme (8-11 grains).

Mercuriol.—Mercury nucleide. 10 per cent. Hg. Bactericide and antiseptic.

Meta-amilo-cinnamic Acid Ethyl-ester.—Local anesthetic.

Meta-amilo-cinnamic Acid Methyl-ester.—Local anesthetic.

Methenyl-ortho-anisidine.—Compound of ortho-anisidine and ortho-formic-acid ester. Local anesthetic.

Methyl-phenacetin.— $C_6H_4(OC_2H_5)N(CH_3)CH_3CO$. Hypnotic.

Methyl-Urethane.— $C.O.NH_2.OCH_3$. Urethylane. Hypnotic.

Monoacetylbresorcin.—Used in cutaneous diseases like resorcin.

Modoformol.—Antiseptic dressing.

Morphine Caseinate.—Compound of morphine and caseine, readily soluble in water.

Morphine Mono-ethylether Hydrochlorate.—See Dionin.

Mutase.—Nutritive prepared from leguminous plants.

Naphtoformin.—Condensation product of alpha- or beta-naphtol, formaldehyde, and ammonia. Antiseptic for cutaneous diseases.

Naphtol-Eucalyptol.—Compound of alpha- or beta-naphtol and eucalyptol. Surgical antiseptic.

Nargol.—Silver nucleide. 10 per cent. Ag.

Negrolin.—Disinfectant.

Nirvanin.—Hydrochlorate of diethylglycocoll-para-amido-ortho-oxybenzoic-acid methylester. Local anesthetic in 0.1-0.5 per cent. solution.

Nucleides.—Compounds of nucleol with oxides of various metals (iron, copper, silver, mercury, etc.).

Nucleol.—Nuclein obtained from yeast.

Oculin.—Glycerinic extract of the ciliary body of the eyes of oxen.

Oxydol.—Solution of hydrogen peroxide.

Oxymethylphtalimide.— $C_6H_4 \left\langle \begin{array}{c} CO \\ CO \end{array} \right\rangle NCH_2OH$. Surgical antiseptic.

Pentodyne.—Analgesic and antipyretic.

Phebalium Argenteum.—A West-Australian Rutaceæ credited with vesicating properties.

Phesine.—Sulpho-metadihydroxy-benzene. Antiseptic dermic.

Phenegol.— $C_6H_5 \begin{array}{c} /O \\ -NO_2=Hg= \\ \backslash SO_3K \end{array} \begin{array}{c} O \backslash \\ -O_2- \\ SO_3 / \end{array} H_5C_6$. Mercury-potassium nitro-paraphenolsulphonate. Antiseptic and bactericide.

Phenetidine Citrate Para.—Monophenetidin citrate. Antirheumatic and antipyretic.

Phenol Diiodide.—Diiodophenol iodide. Succedaneum for aristol.

Phenoleum.—Antiseptic.

Phenoxycaffeine.— $C_8H_9(OC_6H_5)N_4O_2$. Analgesic. Dose: 0.25 gramme (4 grains).

Pimpinellin.—Bitter principle isolated from root of *Pimpinella saxifraga*.

Pipitzahoac.—Mexican name for root of *Perezia adnata*. Purgative. Dose: 3–5 grammes (45–75 grains).

Quinine Caseinate.—Compound of quinine and casein.

Quinine Sulphocresotate.—Internal antiseptic.

Salfene.—Analgesic and internal antiseptic. Dose: 0.3 gramme (5 grains).

Saophen.—Antineuralgic and analgesic.

Sapodermin.—An antiseptic soap said to contain from 0.5 to 1 per cent. of mercury albuminate.

Silberol.—Silver parafenolsulphonate: Hydrargyrol. Vulnery and antiseptic.

Sodium Acetanilid-sulphonate.—Soluble antipyretic.

Sodium Meta-vanadate.—Vaunted succedaneum for arsenic. Dose: 0.001–0.008 gramme.

Sodium Methylacetanilid-sulphonate.—Antipyretic.

Sodium Persulphate.— $Na_2S_2O_8$. Surgical bactericide and vulnery. Used in 3–10 per cent. solution.

Sodium Phenacetinsulphonate.—Soluble succedaneum for phenacetin. Antipyretic.

Steriline.—Ointment-base and vehicle.

Strychnin-Sodium Nitro-Salicylate.—A water-soluble strychnine salt for internal use.

Sudol.—Mixture of adeps lanæ and glycerin with 3 per cent. formaldehyde. Used in skin diseases and in excessive perspiration.

Sulfosot.—Potassium creosote-sulphonate. Antitubercular. Dose: 0.3–1.3 grammes (5–20 grains) several times daily.

Sulpho-paraldehyde.— $(C_4H_4S_2)_3$ Tri-thialdehyde. Hypnotic.

Tang-Kui.—See Eumenol.

Tannocasum.—Compound of tannin and casein. Intestinal astringent.

Tartaric-acid Diphenyl Ester.— $\text{CHOH.COOC}_6\text{H}_5$. Antirheumatic and antipodagric.

Thermol.— $\text{C}_{14}\text{H}_{15}\text{NO}_3$. Antipyretic and analgesic.

Thymol Carbonate.—Succedaneum for thymol for internal use.

Triphenetolguanidine hydrochlorate.—Local anesthetic in eye practice.

Trithialdehyde.—See Sulpho-paraldehyde.

Urthylane.—See Methyl-urethane.

Urosin.—Mixture of quinic acid and lithium citrate in tablet form.

Uric-acid solvent,

Vasothion.—Compound of vasogen and sulphur, used in chronic skin diseases.

Win-Row.—See Eumenol.

Zinol.—Mixture of zinc acetate and aluminol.

THE NEW ELEMENT VICTORIUM.—The new element to which Sir William Crookes gave the provisional name of *Monium* has been renamed *Victorium*. It is less basic than yttria and more basic than most of the earths of the terbia group.—*Brit. and Col. Drug.*, 1899, p. 265.

THE CAMPHOR TREE is being planted as a street tree in New Orleans. A tree in a 4-inch pot in 1883 is now 35 feet high and 52 inches in circumference.—*Meehan's Monthly*, 1899, p. 168.

CURLED HORSEHAIR forms one of the best mechanical devices for cleansing the skin that has yet been discovered. About 3 drachms of curled hair are made into a loose pad. It retains its shape, is easily cleansed before and after each surgical operation; bichloride solutions do not affect it; it may be kept in alcohol, and thus being sterilized, is always ready for use.—Abstract in *N. Y. Med. Jour.*, Sept. 23, 1899.

OPALISIN, a new proteid principle, has been discovered by Wroblewski. It receives its name from the opalescent appearance of its solutions. It was obtained by the addition of sodium chloride to the fluid remaining after the precipitation of the casein in human milk by hydrochloric acid.—*The Amer. Pract. and News*, 1899, p. 233.

HYDROCYANIC ACID GAS has been recommended by Willis G. Johnson as a lethal agent, to be used in place of the rope or the electric current in capital punishment.—*Sci. Amer.*, 1899, p. 299.

DEXTROSE is the principal sugar in gentian root. Its identity has been proven by Hérissey (*Jour. Phar. Chem.*) by its rotary power and the melting point of its osazone.—*Brit. and Col. Drug.*, 1899, p. 522.

THE SEEDS OF *DATURA FASTUOSA* contain, according to Mareevw (*Chem. Centralb.*), about 1.5 per cent. of hyoscyamine.—*Ibid.*

EDITORIAL.

MICRO-ORGANISMS AND DISEASE.

While our present knowledge of electricity may be considered to be a child of the nineteenth century, it must be admitted that our knowledge of bacteriology is essentially that of the youngest child of this century. It is only a comparatively few years ago that the eminent physicist, Balfour Stewart, referred to the micro-organisms that were suspected of causing disease as representing a world of creatures, of which we know as little as of the inhabitants of Mars. How much attention has been given to the study of the different micro-organisms, bacteria in particular, is shown by the voluminous literature on the subject, including not only the various periodicals devoted entirely to this subject, but other publications as well during the past ten years. Beginning with the remarkable results of the labors of Pasteur, we find that in the hands of various investigators the studies of the various micro-organisms have unquestionably aided the manufacturer and physician in their respective vocations, and we can safely say that we are dealing with a form of life that we do and shall know more about in the immediate future than of the life on any of the other planets in years or even centuries to come.

In regard to the subject of disease being due to various forms of micro-organisms, which had its advocates more than 2,000 years ago, it must be said that "there still exists a controversy between the bacteriologists and the older pathological school over the role which is played by the bacterium as a cause of disease. While Koch and his pupils still hold largely to the orthodox teaching that the bacteria alone represent the 'cause' of those diseases which are designated as bacterial, the opponents of this view will only recognize the bacteria as partial causes, and find in certain changes of the tissues, which they designate as predisposition, auxiliary causes of disease. Some go as far as to deny the etiological influence altogether of the bacilli."¹ A large number of experiments have been made which would tend to show that in both animal and plant life, the latter in particular, there must be a certain lack of tone, or a predisposition on the part of the plant or animal, before the bacteria become active, *i. e.*, the tissues must undergo certain changes before they can become diseased bacterially.

While there are evidences of the more or less accidental discovery of ways and means for combating disease by the ancient Hindus and Persians, it must be admitted that it has been demonstrated that in at least certain cases it is the presence of certain micro-organisms, or at least the production of metabolic products from them, that causes disease and that the serum-therapy of the past few years, as scientifically applied in the administration of certain antitoxins, in at least some cases, justifies the labors that are being put forth by a large class of investigators, *viz.*, the bacteriologists. But while the germ theory appears entirely admissible in specific infections in which rare forms of bacteria are constantly associated, as in glanders or anthrax, "it is well to remember that such virulent affections as variola, scarlatina, yellow fever and syphilis appear to have no bacterial causation. When a germ is really the

¹ See the following: *Pediatrics*, 1898, p. 507; *Eclectic Med. Jour.*, 1899, p. 553; *Amer. Pract. and News*, 1899, p. 283; *Medical Age*, 1899, p. 857; Editorial in this JOURNAL, 1899, p. 94.

cause of a disease, modern methods of cultivation, staining, or both, readily demonstrate its existence, and when no germ can be found, it by no means logically follows that one must be present. It is generally admitted that the bacterium is pathogenic, by virtue of certain highly poisonous toxins, or ferments, which are either set free during its life or after its death. There is every reason to believe that substances equally poisonous and pathogenic may be formed without the aid of pathogenic bacteria. Schleich, the noted investigator, has notes of a surprising number of cases of wound infection in which pathogenic bacteria are not at all in evidence. He explains these cases of infection as due to catalytic or contact chemical action; for instance, rancid oil possesses a ferment potency, and only in this way can we explain the infinite variety in wound infection. If the cause of infected wounds is a streptococcus, we would have typical symptoms, one case would resemble another, or in a word, the streptococcus should cause a specific affection. All talk about 'increased virulence,' 'favorable soil,' etc., is, to a certain extent, begging the question. Schleich, in addition to (1) decomposing oils, has described a group of wounds from (2) infected saliva. Close observation teaches us that the bite of every species of animal has a distinct individuality. Dissection wounds, infected by decomposing fluids, constitute a third group. It appears to be certain that the pathogenic agency in all such cases is a ferment. Half a century or more ago pathologists wrote much of ferments as causes of disease, but at that period we had no evidence that such bodies existed in pathology. We now know that ferments play a part in disease, that they are able to liquefy solid tissues and coagulate albuminous fluids. One of the most striking forms of local surgical infection takes the form of a solidification and necrosis of subcutaneous fat, and surely nothing but a ferment could produce such a condition; while it is almost certain that this ferment is not of specific, bacterial origin, but may be formed in the disintegration of organic compounds, in which, at most, only harmless saprophytes play a part. The truth is that men of the type of Rosenbach and Hueppe—two of the pioneers of bacteriology—have always had conservative leanings in regard to the pathogenic power of bacteria. It is the man without practical knowledge of micro-organisms who claims everything in pathology as the work of the latter, and it is another sciolist who takes the opposite ground of bacteriological nihilism. The attitude of Schleich is, therefore, one to be copied by men at once conservative and wise."¹ The subject is one of great interest, and while apparently positive information of all kinds is at our command, it is well to remember that the truth as finally revealed will no doubt tend to show that certain of the micro-organisms may exist in a symbiotic relationship in the plant and animal, others apparently only live on tissues when in an unhealthy condition. Still, in other cases, a diseased condition of the organism is due to the fact that either the leucocytes have not been able to destroy the invading pathogenic bacteria or that the organism has not produced physiological antagonistic substances to counteract the poison secreted or excreted by the bacteria. Our knowledge of bacteria is more objective than subjective, and until more extended results and observations are at our command in regard to the relationship between micro-organisms in the healthy and diseased condi-

tions of plants and animals, we may expect an abundance of speculation and a multiplicity of theories regarding this subject. Even after a savant like Pasteur has illuminated such a subject as fermentation, we have seen, as was pointed out in last month's editorial, that the exact relationship between micro-organisms and fermentation is a more complicated and interesting one than at first supposed. The same will, no doubt, prove true in the study of micro-organisms and diseases of animals and plants.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A MANUAL OF ORGANIC MATERIA MEDICA AND PHARMACOGNOSY. By Lucius E. Sayre, B.S., Ph.M., Dean of the School of Pharmacy, Professor of Materia Medica and Pharmacy in the University of Kansas. Second edition, revised, with Histology and Microtechnique, by Wm. C. Stevens, Professor of Botany in the University of Kansas. With 374 illustrations. Philadelphia: P. Blakiston's Son & Co. 1899.

The plan of this work is a comprehensive one, the intent of the author evidently being to give the greatest possible amount of information in the least possible space. The scope of the work is lessened from that of the first edition by dropping out the chapters on "Morphology" and "Organic Remedies Formed by Synthesis." The first of these could be well spared, as it was too much abridged to be of special value, but the dropping out of the latter is a decided loss. The book is designed for the use of students making a systematic study of organic drugs, but several features make it of value as a reference book.

In the fore part of the book is a "Conspectus," in which the drugs are elaborately classified, and in the back part a "synopsis" of Natural Orders, arranged in the order in which they are studied in the body of the book. The number of drugs studied is 628; those official are, of course, given the greater prominence, and are printed in larger type, so that one may know at a glance which are official. In the study of individual drugs, one gets in a condensed form a large amount of information, all of the important facts, excepting, perhaps, their history, being given in plain, concise language. A desirable feature is the dosage, which is given, not only of crude drugs, but of all official preparations. The large number of illustrations throughout the book, both macroscopic and microscopic, are excellent and true to the subject. Part III is an interesting chapter on "Insects Injurious to Drugs."

The chapters on "Elements of Plant Histology and Microtechnique" are very instructive. The proper use of the microscope and microtome is stated in a way that can be readily understood by the student.

In the chapters on Histology there is a commendable lack of extreme technicalities, that are too much in evidence in some recent works on this subject, intended for the use of students in colleges of pharmacy.

After enumerating the many excellent qualities of this book, one feels like passing over the fact that it contains some errors. For example, on page 123, under "Source of Coca," is this phrase: "The bush bearing coca bean is extensively cultivated," etc. Students are apt to get "Coca" and "Cacao" mixed in their minds, and this phrase tends to add to the confusion. The per cent.

of oil of lemon in Spir. Aurantii Comp. is stated to be 20 per cent.; it is 5 per cent. Spiritus Anisi is omitted under official preparations of Oleum Anisi. Under Physostigma, reference is made to the "Curved radicle." The radicle does not exist in the embryo, and recent works on botany refer to the organ by its proper name of Caulicle. "Extractum Phytolaccæ Fluidum" is placed under the fruit, instead of the root. The habitat of "Sandarac" is given North America, instead of Africa. Digitalis is said to be most commonly adulterated with mullein, a most improbable adulterant, and never found, at least in recent years.

The acidity of Rhus Toxicodendron is stated to be due to toxicodendric acid. Extended research, made three or four years ago by Professors Pfaff and Balch, of the Harvard Medical School, showed the poisonous principle to be an oil, to which they gave the name of toxicodendrol.

It may be said that errors occur in most books, but it is also to be said that a book specially designed for students is valuable in inverse ratio to the number of errors.

Notwithstanding this, however, the work is a valuable one, and will be largely used as a text and reference book.

C. F. NIXON.

LEOMINSTER, MASS.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, at the forty-seventh annual meeting, held at Put-in-Bay, O., September, 1899

An abstract of the Proceedings of the forty-seventh annual meeting of the A. Ph. A. has already been given in the October issue of this JOURNAL. The Proceedings as published contain, in addition, the Report on the Progress of Pharmacy, the Constitution, By-Laws and Roll of Members. The most valuable part of the book, outside of some of the original papers, lies in the Report on Progress of Pharmacy. The Proceedings have been brought out again on good time, which reflects creditably on the Secretary. It is unfortunate, however, that the matter of indexing is not so sufficiently complete as to render the volume as valuable as it otherwise would be. No mention is made in the index of the improved formula for solution of magnesium citrate, given on p. 75, or of the improved formulæ for syrup of tolu, on pp. 75, 76, or of the improvements on other pharmaceutical preparations, etc., as contained in the valuable report of the Chairman of the Committee on Practical Pharmacy. The same criticism of failing to index them applies to papers enumerated and abstracted from the Proceedings of the different State Associations, on pp. 784-794, as well as to the names of deceased members of whom obituary notices are given in the Report of the Committee on Membership. It is not necessary to say that the value of a good book lies in a comprehensive and working index. The editing of such a work is not a small task, and when one considers the limited time in publishing the book, it appears remarkably free from mistakes, and we find that nearly all of the unimportant things have been omitted, while the important matter has been condensed as much as possible. It is questionable, however, if the discussions should not be even more condensed. Such a procedure, it is true, would tend to rob the Proceedings of much of their value, particularly to those members who do not for various reasons attend the meetings.

LEXIKON DER KOHLENSTOFF-VERBINDUNGEN, von M. M. Richter. Zweite Auflage der "Tabellen der Kohlenstoff-Verbindungen nach deren empirischer Zusammensetzung geordnet." Hamburg and Leipzig: Verlag von Leopold Voss. 1899. London: Williams & Norgate; Paris: H. Le Loudier; New York: G. E. Stechert.

This work consists of 35 Lieferungen, which are published in the form corresponding to Beilstein's Handbuch der organischen Chemie, 3 Aufl., and it may be said that it can be employed as an index of this valuable book. In 1883 M. M. Richter published his "Tabellen der Kohlenstoffverbindungen," which contained the mention of about 16,000 compounds. It is estimated that in Beilstein's Handbuch there are about 57,000 organic compounds described, whereas, in the present edition of Richter, the title of which has been changed as above noted, 67,000 organic compounds are considered.

In the consideration of all the carbon compounds known up to date, the author has arranged them in a manner conforming to the arrangement recommended by the Council of the German Chemical Society, and introduced into the Berichte in 1898.

The arrangement of the compounds depends first upon the number of carbon atoms in them and then upon the number of elements which, in addition to carbon, are contained in the compounds. The succession of the elements combined with carbon is determined by their frequency of occurrence in some cases, as with H, O, N; Cl, Br, I, F; S, P; whereas the others are arranged in alphabetical order, as Al, As . . . Zr. So that if one is desirous of looking up cocain one turns to the C_{17} group with three elements and under $C_{17}H_{21}O_4N$ are given the melting points, derivatives and important references to literature, including Beilstein. But here is also given corresponding comparative information of no less than sixteen isomeric compounds, as atrosin, i-scopolamine, hyoscin, etc. The literature to which references are given is that which relates particularly to the preparation, properties and decomposition of the carbon compounds. No reference is made to purely theoretical papers, nor those with analytical, mathematical, crystallographic or medico-physiological information. The literature is fully treated up to the end of the first quarter for 1899, and the publishers propose to edit yearly supplements to the Lexikon. The work is not only to be regarded as an index *par excellence* to Beilstein, but is also an index to the important chemical literature on the preparation and properties of the carbon compounds, as well as treating tersely of properties of the compounds themselves. The book is such as one continually desires in laboratories where organic chemical work is being carried out, and no manufacturing plant or chemical laboratory or library is complete without this well-digested and conveniently arranged Lexikon, which is published at such a reasonable price, being M. 1.80 for each Lieferung.

A SYSTEM OF INSTRUCTION IN QUALITATIVE CHEMICAL ANALYSIS. By Arthur H. Elliott, Ph.D., Emeritus Professor of Chemistry and Physics, and George A. Ferguson, Ph.B., Professor of Analytical Chemistry and Director of the Laboratory in the College of Pharmacy of the City of New York. Third Edition, 1899. Published by the authors at 115 West Sixty-eighth Street, New York. Price, \$1.50.

The first and second editions of this manual were reviewed in this JOURNAL (February, 1893, and March, 1894). The authors state that in this edition the

field has been widened and the work made more useful by numerous additions, and, in some instances, by the substitution of schemes which have been found to be shorter and to give better results when used by the beginner in chemistry. Thus, the scheme for acids has been changed, a number of radicals being included which were not mentioned in the last edition, and an endeavor is made to make this more practical for mixtures containing the interfering acid radicals. The sections are numbered consecutively throughout the book, but the index references are to the pages, and seem to be quite complete. The book is of convenient form and size for ready reference.

S. P. S.

SEMI-ANNUAL REPORT OF SCHIMMEL & Co. (Fritzsche Brothers). Leipzig and New York. October, 1899.

These semi-annual reports, containing as they do so much information on the essential oils, may be said to have been for years the harbingers of enlightenment and instruction on the special properties characterizing pure essential oils, and distinguishing them from the sophisticated products. It will be welcome news to those in the United States who do not have a working knowledge of German, that the masterly treatise on "Essential Oils," by Gildemeister & Hoffmann (already reviewed at length in this JOURNAL, 1899, p. 439), will be translated into English. We are informed that both French and English translations of this work will be ready by the 1st of May, 1900.

A most excellent *résumé*, as usual, is given of the progress relating to the scientific as well as commercial aspect of the essential oils during the past six months. Some of these we will call attention to in later issues of this JOURNAL.

"The property of aqueous solutions of sodium salicylate, of giving a clear solution with the oxygenous constituents of essential oils, has been carefully studied by M. Duyk.¹ His experiments show that the maximum power of solution is possessed by a solution of sodium salicylate in an equal part of water, a colorless syrupy liquid of 1.240 specific gravity. Duyk determined the solubility of a number of pure alcohols, ketones, aldehydes and phenols by dissolving 1 c.c. of the material in 4 c.c. of the salicylate solution above referred to, and adding water by drops, under constant shaking, until a permanent cloudiness ensued. He thus obtained the following results:

Eugenol solution required, for separation	3.5 c.c. water.
Geraniol " " "	2.5 " "
Benzaldehyde " " "	2.5 " "
Carvone " " "	2.0 " "
Citral " " "	1.7 " "
Cineol " " "	1.5 " "
Cinnamic aldehyde " " "	1.5 " "
Citronellal " " "	0.5 " "

"The hydrocarbons of the terpene series are insoluble, or nearly so, and can therefore be mostly separated from the oxygenous bodies. Duyk distinguishes the latter into two classes, according to their solubility.

(1) Easily soluble:

(a) Alcohols: Geraniol, linalool, citronellol, borneol, menthol.

¹ Bull. de l'Acad. Royale de Médecine de Belgique, 1899, 503.—Ann. de Pharm., 5 (1899), 348.

(b) Aldehydes : Benzaldehyde, salicylic aldehyde, anisic aldehyde, cinnamic aldehyde, citral, citronellal, cuminic aldehyde, vanillin, heliotropin.

(c) Ketones : Carvone, methyl-heptenone, pulegone, methyl-nonylketone, menthone, thujone, camphor.

(d) Phenols : Eugenol, thymol and carvacrol.

(e) Cineol.

Of these bodies, menthol and camphor are less soluble than the others.

(2) Less soluble, or insoluble :

(a) Sesquiterpene alcohols : Santalol.

(b) Phenol derivatives : Anethol, safrol, apiol.

(c) Esters of borneol, geraniol, linalool and menthol.

"Finally, the author has examined a series of essential oils for their relative solubility, and recommends this property to be used in testing the purity of oils, a method which may be practical in certain cases. His suggestion, to use the process referred to for the preparation of oxygenous derivatives of oils, would probably not be technically possible, because of its great cost and the insufficient purity of the products obtained. For although hydrocarbons are practically insoluble in a pure salicylate solution, they are absorbed therein in a larger degree, if that solution already contains oxygenous bodies in state of solution.

"The most interesting result of Duyk's research is the establishment of the fact that alcohols are much more soluble than their esters. As an instance we may mention Bergamot oil, of which, under direct treatment, 12 per cent. was absorbed by the salicylate solution, and after saponification, 35 per cent. The difference of 23 per cent. represents linalool, which was present in the oil as linalyl acetate. Saponification had shown the oil to contain 31.5 per cent. of linalyl acetate, equal to 24.75 per cent. of linalool.

"Although we do not implicitly share Duyk's expectations in the practical advantages of the sodium salicylate process, we believe that it may play a useful part in special cases, as well as in the scientific examination of essential oils."

EDITORIAL NOTES AND COMMENTS.

PHARMACY.—The question of the commercial purity of asafetida has been the subject of some interesting discussion in Great Britain as the result of a paper on this subject read by Mr. Moore, at the Society of Public Analysts. The B. P. requires that asafetida shall yield not less than 65 per cent. of matter soluble in alcohol and shall not yield more than 10 per cent. of ash when incinerated. C. G. Moore and Dr. Martin¹ recently examined twelve samples of the gum resin, and found that the percentage soluble in alcohol ranged from 14 to 39 and the ash from 26 to 63. Inasmuch as samples could be had that gave only 7 per cent. of ash, there is reason to believe that the sophistication of asafetida was intentional by those who collected the drug. Mr. Moore further claimed that the requirements of the B. P. were too high unless steps could be taken to raise the standard of the commercial article. In

¹*Chem. and Drug.*, 1899, p. 953.

the discussion which followed the reading of Mr. Moore's paper, Mr. Chattaway said that he had found asafetida in tears as required by the B.P. to give 8 per cent. of ash, and some even as low as 2 to 3 per cent. Mr. Cribb said that samples purchased of London chemists contained from 15 to 37 per cent. of ash. Mr. E. M. Holmes, acting as referee to the B.P. committee, had examined asafetida, and said that while the ash of the crude drug often reached from 20 to 60 per cent., still pure samples yielding as low as 8 per cent. had been found upon the market.

J. C. Umney,¹ in a recent paper, has given his results on the ash yielded by asafetida, which varies in the picked tears from 3.2 to 13.9 per cent.; in commercial masses from 35.5 to 62.2 per cent. and in powdered gum resin from 21.5 to 57.7 per cent. The solubility of asafetida in alcohol Mr. Umney finds to vary from 21.1 to 79.8 per cent., and furthermore that there is a great difference in the solubility in alcohol of 50 per cent. and 70 per cent. Mr. Umney claims that a case of the finest drug that enters the port of London would not yield 5 per cent. of the drug of the official standard, although tears could be picked answering the pharmacopœial requirements. The printing of proportions of ash yielded by the various grades of powdered gum as practised by some wholesalers is commended and it is recommended that in the preparation of the tincture the quantity of drug be increased so that 100 c.c. yield 12 grammes of extractive.

In a subsequent note on the subject, Mr. E. M. Holmes² points out the fact that in none of the more recent Pharmacopœias—German, Swiss and Japanese—does the per cent. of ash in asafetida exceed 10 per cent. as the maximum, and that Mr. Umney himself has shown that the tears will yield between 3-6 per cent. of ash. In regard to the scarcity of good asafetida Mr. Holmes considers it purely a matter of price, and that if dealers would pay the price the demand would soon bring about a supply. "The standard of purity for drugs to be used in prescriptions should be the very highest obtainable, and it can hardly be expected that the General Medical Council should countenance the use of a drug containing 20-60 per cent. of mineral matter to suit the convenience of cheap buyers, when an article containing less than 10 per cent. is procurable by those who will pay an adequate price for it and buy it when imported."

Mr. Holmes further considers that, inasmuch as there is a use for asafetida outside of prescription work, there is, therefore, a necessity for a normal or average standard of purity of drugs to be used for technical and domestic purposes. This is certainly an interesting subject, and involves a question as to whether high pharmacopœial and legal standards will drive out poor or sophisticated drugs, and as to whether low standards of articles for technical and domestic purposes (unless standardized and sold on standard) may not tend to keep the article from meeting the highest requirements in regard to purity for other purposes.

CHEMISTRY.—The explosion of 156 tons of *chlorate of potassium* which was properly packed and stored and in which no organic matter was present, at St. Helens, appears to be analogous, according to C. A. Lobry de Bruyn,³ to a

¹ *Chem. and Drug.*, 1899, p. 983.

² *Chem. and Drug.*, 1899, p. 1037.

³ *Zeitschr. f. angew. Chem.*, 1899, p. 633; *Chem. News*, 1899, p. 270.

local fire which broke out in a gun-cotton magazine; the fire began slowly, the gun-cotton simply decomposed and burnt. After this, the fire spread, and eventually a moment arrived when the gas generated could not escape sufficiently quickly, and thus collected, it acted the part of a detonator and caused the remainder of the gun-cotton to explode with violence. As a matter of fact, chlorate of potassium requires a much more powerful detonator than does gun-cotton; it is not combustible by itself, but it is probable that at St. Helens a portion of the salt was decomposed by a local fire in the immediate neighborhood of the magazine, and that the rapid accumulation of gas caused the explosion above referred to.

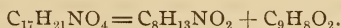
In a contribution to the *Chemistry of Honey*, O. Haenle¹ has made a comparison of (1) pure honey produced by bees from flowers with that (2) produced by bees fed upon sugars and the so-called (3) "artificial" honey. He found that they gave marked and characteristic polarization numbers, as follows: The first was -35° to -37° ; (2) gave -3° and (3) -50° .

Continuing their researches on essential *oil of jasmine*, Hesse and Müller² have recently communicated an analytical process suitable for the quantitative determination of the components of a mixture of benzyl acetate. It is based upon the behavior of the said compounds toward a cold 3 per cent. solution of potassium permanganate. This reagent causes the quantitative oxidation of the benzyl alcohol into benzoic acid. Benzyl acetate, on the other hand, is not attacked; while linalool and linalyl acetate are completely decomposed with the formation of acetic and carbonic acids. The authors, after having tested the practical usefulness of their method on artificial mixtures of known composition, have applied it to the examination of essential oil of jasmine, with the result that this oil was found to contain about 65 per cent. of benzyl acetate, 7.5 per cent. of linalyl acetate, 6 per cent. of benzyl alcohol, and 16 per cent. of linalool.

In a paper on the *solanaceous alkaloids*, Hesse³ calls attention to the fact that pure atropine is optically inactive and that, on keeping, it becomes active, owing to the presence of hyoscyamine. Atropine and hyoscyamine yield tropin and atropic acid according to the following:



Hyoscine and atrosin (in root of *Scopolia atropoides*) yield oscin and atropic acid as follows:



BOTANY.—In a note on a *spurious Alexandria senna*,⁴ Henry G. Greenish calls attention to a so-called "Alexandria senna" imported from Suez, which differs from the official drug in that the leaflets are obovate in outline, maybe 2 centimetres by 1 centimetre, have a rounded mucronate apex and distinct primate venation. The upper surface is glabrous and the lower pubescent. The odor is senna-like, the taste being mucilaginous. In powder the peculiar papillæ-like epidermal cells of the under surface, resembling those in coca, are characteristic.

¹Pharm. Zeit., 1899, No. 83; *ibid.*, 797.

²Ber. d. Deutsch. Chem. Ges., 1899, p. 765; through Schimmel & Co.'s Report, October, 1899.

³Ann. d. Chem., 1899, Bd., 309, p. 75.

⁴Pharm. Jour., 1899, p. 470.

The drug, which is nowadays on the market under the name of *opopanax*, is almost certainly derived from *Balsamodendron Kafal*, Kunth, a plant of the natural order Burseraceæ. The true *opopanax*, of the natural order Umbelliferae, is difficult to obtain, and is derived, as is generally accepted, from *Opopanax Chironium*, Koch (*Ferula Opopanax*, L.). A chemical examination of undoubtedly genuine *opopanax* has recently been made by A. Kniti.¹ The essential oil was separated from the bulk by shaking the alcoholic resin solution with petroleum ether. By treatment with bisulphite solution, a brown fat was isolated from the oil, which, by sublimation between watch-glasses, produced white, odorless needles, M. P. 135-134°, formula C₂₀H₁₀O₇. It has received the provisional name "oponal." The oil, upon fractional distillation, yielded first a colorless distillate, with an odor like lovage, and afterward a portion colored blue. In the neck of the retort, crystals of "oponal" separated out.

The investigations of Leprince² on the bark of the *Rhamnus Purshiana* confirm the presence of chrysarobin, chrysophanic acid and emodin.

PHARMACOLOGY.—As a result of a series of experiments on the pharmacology and therapeutics of *Veratrum album* and *Veratrum viride*, H. C. Wood and H. C. Wood, Jr.,³ conclude that the only evidence of differences in action which they have been able to obtain is that *Veratrum album* in toxic doses more frequently purges than does *Veratrum viride*, and that some specimens of *Veratrum album* are stronger than specimens of *Veratrum viride*. The authors believe that, inasmuch as there is hardly any conceivable difference in the action of therapeutic doses of the two plants, it would be proper for the U.S.P. to recognize both species, but as any difference between the two *veratrum*s is in favor of the American drug as less apt to disturb intestinal digestion, the recognition of the European drug seems of doubtful expediency.

According to the experiments of M. P. O. Vejux-Tyrode⁴ it appears that the tincture of the brown seeds of *strophanthus* is much more toxic than that of the green seeds, whilst on the other hand the green seed tincture has a much more marked action on the heart. Dr. Rusby⁴ believes that these experiments prove the existence of two distinct principles, a "toxic principle" and a "cardiant principle," although they have not been isolated. He thinks that the two plants yielding these seeds are specifically distinct. Should these results be confirmed, it follows that the green seeds, or those of *Strophanthus Kombé*, Oliver, should alone be specified and described in the U.S.P.

The poisonous principles in fungi may be brought from a chemical consideration of the subject, according to Kobert,⁵ into either (1) the acids, e.g., helvellic acid; (2) alkaloids or alkaloid-like substances, as muscarin and neuroin; or (3) albuminoid or albuminoid-like compounds, as the enzymes and toxalbumins of fungi. From a pharmaco-pathological standpoint they may be divided (if we except ergot) into those (1) acting purely upon the nerves, as muscarin and fungous-atropin; (2) those that produce local irritation, as in various species of *Lactarius* and *Russula*; (3) and those acting primarily upon the blood, as the helvellic acid of *Lorchel* and the phallin of *Amanita phalloides*.

¹ *Archiv. d. Pharm.*, 1899, p. 256, through Schimmel & Co.'s Report, October, 1899.

² *Compt. Rend.*, 1899, T., 129, p. 60; *Pharm. Zeit.*, 1899, p. 822.

³ *Amer. Jour. Med. Sci.*, 1899, p. 562; *Med. Chronicle*, 1899, p. 107.

⁴ *Amer. Jour. Med. Sci.*, July, 1899; *Med. Chronicle*, 1899, p. 176.

⁵ *D. Aertze. Zeit.*, 1899, No. 11; *Pharm. Zeit.*, 1899, p. 797.

Many attempts have been made to free *tobacco* from its nicotine, but no one as yet has completely solved the problem. Stern¹ thinks the method of Gerold the best yet devised. It consists in treating tobacco with a decoction of tannic acid (15 grammes) and oil of origanum (30 grammes); water, 750 c.c., to be boiled down to 550 c.c. After the tobacco has absorbed the liquid it is treated with moderate pressure and heat. With cigars made from tobacco thus prepared, Stern has experimented with patients who were non-smokers and got practically no disturbance of the heart, respiration or nervous system.

Bulletin des Sciences Pharmacologiques is the title of a new pharmacological journal which contains the names of over forty collaborators who are well known in pharmaceutical and medical circles.

BACTERIOLOGY.—It is a matter of great concern that pharmacists generally appreciate the value of vaccination and the treatment of diphtheria by antitoxin. It is a matter of record how in Germany, where in 1871, with a population of 50,000,000, there were lost over 140,000 lives by *smallpox*, and there is at the present time, since vaccination has been rendered compulsory in that country, a mortality which from the same cause has dwindled to an almost nominal figure. "The anti-vaccinationists claim that the ravages of disease have been stayed, not by means of vaccination, but because of the great advances made in municipal and domestic hygiene. This contention is, to a very large extent, an idle one; personal cleanliness and good sanitation may effect something in this direction. In the case, however, of a susceptible person directly exposed to the contagion of smallpox, these would be but slender reeds on which to lean. Effective vaccination is the only reliable safeguard. Much of the objection urged formerly against vaccination was for the reason that it was often carelessly performed and that the lymph was frequently not aseptic and consequently calculated to induce infection. With the introduction of carefully prepared glycerinated vaccine lymph, all fear of danger from these sources has been completely eliminated, and if lymph thus prepared is used, in place of the old-fashioned points, no unpleasant effects, such as sore arms, fever or scars, will follow vaccination. We would earnestly impress upon the minds of our readers that vaccination does not only concern the individual, but is a matter of the highest importance to the public at large, and parents, guardians and employers who do not insist on its performance are guilty of a grave dereliction of duty."²

At the last meeting of the American Medical Association, the Section on State Medicine had some interesting papers, followed with discussion, on the *Treatment of Diphtheria with Antitoxin*. In Denver, the mortality from diphtheria has been reduced from 28.7 per cent. in 1894, before the antitoxin was employed, to 8.8 per cent. in 1898. In the city of Chicago the yearly average of deaths from diphtheria for 1886 to 1895 was 1,417; between 1896 and 1898, the yearly average was reduced to 851—thus an annual saving of 566 lives. The statistics for all parts of this country, as well as abroad, show a similar reduction in mortality for diphtheria since the employment of the treatment with antitoxin. "By the timely and intelligent employment of the antitoxin, epidemics can be controlled, severe cases are rendered mild and

¹*Med. Rev. of Reviews*, April, 1899; *Pediatrics*, July, 1899.

²*Pediatrics*, 1899, p. 410.

laryngeal complications are less common. In a word, no more powerful resource than the antitoxin of diphtheria has been added to the armamentation of the physician since the discovery and introduction of vaccination for smallpox."¹ However doubtful the value of vaccination and use of antitoxins may seem to some, the statistics which are at hand regarding the successful treatment of diphtheria and stamping out of smallpox would indicate that it is not only sanitary measures which are valuable, but that the employment of vaccine and antitoxin that are properly prepared, sanitarily preserved and properly applied have in great measure contributed to the notable reduction of the mortality due to smallpox and diphtheria. Pharmacists ought to be prepared to supply these remedial agents at a moment's notice, and it is a grave dereliction of their duty towards the medical profession and the public not to be able to do as required.

AMERICAN PHARMACEUTICAL ASSOCIATION.

SCIENTIFIC SECTION.

The following is a list of the queries submitted by Committee on Scientific Papers :

- (1) A paper on Urine and bacteriological examinations by pharmacists.
- (2) Cannot disinfection of infected houses be undertaken by pharmacists in the smaller cities and towns with profit to themselves? A paper on the methods employed is desired.
- (3) To what extent are official plasters employed in the practice of Pharmacy and Medicine?
- (4) What has been the effect of Serum therapy on the practice of Pharmacy?
- (5) Official *Aspidium* is said to be difficult to obtain. What is usually supplied for it, and what is the medicinal value of the substitute?
- (6) Is it desirable to increase the strength of official Syrup of Hydriodic Acid?
- (7) What is the quality of Potassium Iodide and Bromide usually found in the market?
- (8) Give a method of making Liquid Petrolatum free from odor and color.
- (9) Is it practicable to make Red Mercuric Oxide, commercially, entirely free from Nitric Acid or Nitrates?
- (10) What effect has age on *Podophyllum*, after collection, as to the amount of resin it will yield?
- (11) What is the real medicinal value of *Carthagena Ipecac*?
- (12) Have favorable results been obtained by the use of Acetic Acid Fluid Extracts in medicine?
- (13) Hydrochloric Acid sold as chemically pure is said to often contain Iodine and Bromine. Is this a fact?
- (14) Is the U.S.P. Sulphuric Acid test for organic impurities in Salicylic Acid and Sodium Salicylate too rigid?
- (15) Is Salicylic Acid prepared from Oil of Wintergreen more desirable for medicinal use than a carefully prepared synthetic product?
- (16) Is the Oil of Cade usually found in the market such as the U.S.P. describes?

¹ *Jour. Amer. Med. Assn.*, December 16, 1899.

(17) Some pills sold as Quinine Sulphate are found to approach in solubility in water Quinine Bisulphate. Is it proper to sell such pills for Pills of Quinine Sulphate? Examine commercial samples.

(18) Is it practicable to make a compressed tablet which, when added to water, will make Liquor Calcis of the strength of the U.S.P.?

(19) What Fluid Extracts are best made from "green drugs?"

(20) What official solid extracts can be replaced by extracts in powdered form? Give methods for making the same.

(21) Give a formula for making effervescing tablets of Lithium Citrate, which will yield a product reasonably permanent.

(22) What is the most satisfactory diluent for use in making hypodermatic tablets?

(23) Asafetida of commerce is said not to conform with the U.S.P. as to its solubility in alcohol. Should the requirement be changed, and if so, what standard should be adopted?

(24) Embalming solutions are now largely employed by undertakers. Would not the manufacture and sale of these solutions be a proper and profitable business for pharmacists? Give reliable formula for their manufacture.

(25) A paper on "Notes and Observations" of interest to pharmacists.

MINUTES OF THE COLLEGE MEETING.

A quarterly meeting of the members of the Philadelphia College of Pharmacy was held on Thursday, December 28, 1899, at the College, 145 North Tenth Street. Twenty-two members were present; Wm. J. Jenks presided. The minutes of the meeting of September 25th were read and approved. The minutes of the Board of Trustees for the meetings of October, November and December were read and approved.

Mr. Beringer stated that a committee of the Board of Trustees was at work upon a revision of the by-laws of the Board, and suggested that the College should appoint a committee to compile any amendments to the by-laws of the College that may have been adopted since their last publication in 1891. On motion, this work was assigned to the committee already appointed by the Board of Trustees.

Professor Remington referred to the work that had been done by the assistant professors in preparing and placing in the cabinet in the reading room, a complete list of the drugs, chemicals and pharmaceutical preparations of the Pharmacopœia, for the use of the students, which is a feature peculiar to this College, and one that is not known to exist in any other of the colleges of pharmacy; and, as this work had not been officially noticed by either the College or the Board of Trustees, he moved that a vote of thanks be tendered the assistant professors for their work, which motion was unanimously agreed to.

The Librarian announced the receipt from Hon. Robert Adams, member of Congress, of the ten volumes of "Richardson's Messages and Papers of the Presidents, from 1789 to 1897," as a donation to the library of the College. On motion, the Librarian was directed to convey to Mr. Adams the thanks of the College for his gift.

Professor Ryan spoke of the death, recently, of Israel J. Grahame, and eulogized his work for the advancement of pharmacy.

Mr. Boring, Mr. Wiegand, Professor Remington and Mr. Ellis followed with high tributes to the integrity, scientific attainments and devotion of Professor Grahame to the profession of pharmacy.

The Committee on Deceased Members was instructed to prepare a suitable memorial notice for publication in the AMERICAN JOURNAL OF PHARMACY.

Mr. Jenks presented to the College, for the library, eight volumes, from 1818 to 1825, inclusive, of the "American Medical Recorder of Original Papers and Intelligence on Medicine and Surgery," conducted by "John Eberle, M.D., member of the American Philosophical Society and of the Academy of Natural Sciences of Philadelphia."

On motion, the thanks of the meeting were extended to Mr. Jenks for his gift.

On motion, the meeting adjourned.

W. NELSON STEM,
Secretary.

MINUTES OF THE PHARMACEUTICAL MEETING.

The regular monthly pharmaceutical meeting was held Tuesday, January 16th, in the Museum of the College, with William McIntyre in the chair.

Dr. Joseph McFarland, of this city, and perhaps best known as the author of a work on "The Pathogenic Bacteria," was the first speaker on the programme, and made a very interesting address on "Immunity, What is It, and Upon What Does It Depend?" The speaker said that in the sense in which the term is ordinarily employed *immunity means resistance to disease*, and that when considered in connection with micro-organisms the subject may be divided into: (1) immunity to infection, and (2) immunity to intoxication. The most important factors to be considered in the production of infection are (1) the *kind* of bacteria, (2) the *number* of bacteria, for the greater the number of bacteria present the greater the resistance required to withstand them, and (3) their *avenue of entrance*, as for instance if certain kinds of bacteria are introduced into the skin they cause no trouble, but if introduced into the stomach, may and do cause serious illness. (4) The *kind of soil* which the bacteria find is also of much importance. If the individual be in such a condition as to favor the growth of the bacteria introduced into his organism, he is said to be susceptible to their influence. If, however, his system is in such a condition as not to favor the development of the micro-organisms, he is said to be immune.

Immunity to infection may be divided into two distinct classes, namely, *active* and *passive*, the former being dependent upon the natural powers of the individual, while the latter is a condition brought about by artificial means. Active immunity represents a sort of combat between the individual and the bacteria, and this phase of the subject has furnished a theme for much scientific speculation. Two theories are in vogue for explaining it, viz., the cytogenic and the hematogenic. According to the cytogenic theory, there are certain cells in the body which are comparatively free and independent entities, and which wander about in response to certain stimuli. These are the leucocytes or white blood corpuscles, and it is held by some investigators, prominent among them being Metchnikoff, that they have the

power of destroying bacteria; that, according to the law of chemotaxis, they are attracted to the region infected by the bacteria, and that thus they act as the scavengers of the system. According to the hematogenic theory, whose chief advocate is Büchner, the blood contains certain substances, known as alexins, which are destructive to bacteria.

Passive immunity is conferred upon the individual by certain substances, such as antitoxins, comminuted nervous tissue, molecular matters, etc., which are prepared without his influence, but by receiving which (by hypodermic injection, etc.) he becomes immune. The best illustration is in the use of antitoxins for the prevention of disease.

Immunity to intoxication is that resulting from the resistance to, or the destruction of, toxins. It thus appears that immunity means not only the ability to combat the bacteria themselves, but the ability to resist the influence of their poisons as well.

In this connection the speaker alluded to the experiments whereby it has been found that by progressive intoxication a new substance is produced in the blood, which becomes antitoxic, this being the origin of the antitoxins.

Among those taking part in the discussion of the address were Prof. Jos. P. Remington, Dr. C. B. Lowe and Messrs. Jos. W. England and L. F. Kebler.

Professor Remington said that the subject was one fraught with much interest, and inquired whether immunity could be transferred through heredity, alluding in this connection to the natural history illustrations of protective mimicry.

Dr. Lowe spoke of examples of the immunity of young infants to smallpox as due, perhaps, to hereditary influences.

In replying to the previous speakers, Dr. McFarland said that acquired immunity is not hereditary, and that the best illustration of this is furnished by the exanthematous fevers of childhood to which we, who have had them, are immune, though our children are not. Referring to the investigations of Ehrlich, he said that forced immunity may be transferred to the offspring, as shown in the case of mice securing immunity through milk.

In response to a query by Mr. England in regard to the chemical nature of the antitoxins, Dr. McFarland said that there were several views on this point. Some investigators consider them to be proteid substances, while others, like Behring, believe them to be in the nature of forces, and still others look upon them as ferments. On account of the difficulty of separating them from the serum, their exact chemical nature cannot readily be determined. They are precipitated along with the globulins by magnesium sulphate, but no one has yet separated them pure.

Lyman F. Kebler, having been engaged in the examination of certain of the medicinal salts for some time past, presented a paper on "Bismuth Salicylate, Basic." (See page 65.)

Referring to the constitution of some of the bismuth salts, Mr. Kebler said that practically $\text{BiONO}_3\text{H}_2\text{O}$ does not exist. On the other hand, bismuth salicylate is so uniform that there should be no trouble as to its therapeutic effect, and any difference which may have been noted in this respect he thought was probably due to a confusion of the normal and basic salts.

Replying to a series of questions asked by Mr. England in the discussion of the paper, Mr. Kebler said that he had never been able to prepare satisfactory acid

salicylate of bismuth; (2) that it is difficult to answer the question as to the amount of free salicylic present in the basic salicylate, as the addition of alcohol liberates a portion of the acid normally present; and (3) that he had found the Kjeldahl method to be the most simple for estimating the amount of nitrate in bismuth salicylate.

F. W. Haussmann, having been experimenting for some time with the formulas for certain of the official syrups, presented a paper suggesting improved methods for syrup of orange, syrup of wild cherry and syrup of rose.

Mr. E. M. Boring, in remarking on the formula for syrup of orange, said that just in proportion as the syrup is rendered more clear the less flavor it will have. He recommended rubbing fresh orange peel with sugar in a mortar, and also adding the juice of the fruit, the proportion being one orange to one pint of syrup.

A short but interesting communication, entitled "Notes on Beeswax," which was received from Dr. H. V. Army, was read by Dr. Henry Kraemer. (See page 73.) Before reading the paper, Professor Kraemer remarked that Dr. Army has entirely recovered from his serious illness of last summer, which he was sure would be welcome news to those present.

Mr. England called attention to a specimen of fresh or uncured vanilla bean which had been received by Mr. George M. Beringer, from Messrs. Dodge and Olcott.

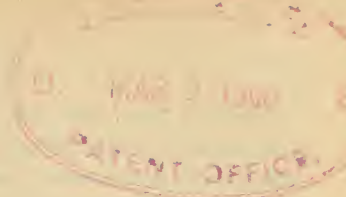
Professor Kraemer exhibited a number of samples of commercial arrowroots, viz., Bermuda, Montserrat, St. Vincent and American, and called attention to the fact that he had been using for several years in his classes Montserrat arrowroot obtained from Evans & Sons, of New York, and that it showed better than any other arrowroot the typical starch grains, and that a microscopic as well as a chemical examination showed it to be as free from foreign impurities as that of Bermuda arrowroot. Comparing it with St. Vincent it was very much better.

On motion, the meeting adjourned.

FLORENCE YAPLE,
Secretary pro tem.

MAXIMUM DOSE.—E. L. Abogado compares (*Chronica Med. Mexicana; Jour. Amer. Med. Assoc.*, 1900, p. 230) the maximum doses of opium as given in the various pharmacopœias of the world, and finds them to differ amazingly. The dose of the powder, for instance, according to the French Codex, is 1 to 10 centigrammes; German, 15 to 20, and Foy's Formulary gives 4 to 5 grammes as the maximum dose. The writer urges the general adoption of the statement of the *initial* dose for an adult, leaving it to the physician to determine how much this can be increased by observation of the effect on the patient.

ASPIDIUM SPINULOSUM has been shown by Lamén (*Brit. and Col. Drug.*, 1899, p. 458) to be a useful anthelmintic.



THE AMERICAN
JOURNAL OF PHARMACY

MARCH, 1900.

SYNTHETIC CHEMICALS UNDER THE WAR REVENUE
ACT.

BY C. A. CRAMPTON AND F. D. SIMONS.

(A paper read before the Washington Chemical Society, February 8, 1900.)

Schedule B, of the War Revenue Act, provides for a stamp tax upon medicinal proprietary articles and preparations, as follows:

“ Medicinal proprietary articles and preparations: For and upon every packet, box, bottle, pot or phial, or other inclosure, containing any pills, powders, tinctures, troches or lozenges, sirups, cordials, bitters, anodynes, tonics, plasters, liniments, salves, ointments, pastes, drops, waters (except natural spring waters and carbonated natural spring waters), essences, spirits, oils, and all medicinal preparations or compositions whatsoever, made and sold, or removed for sale by any person or persons whatever, wherein the person making or preparing the same has or claims to have any private formula, secret or occult art for the making or preparing the same, or has or claims to have any exclusive right or title to the making or preparing the same, or which are prepared, uttered, vended or exposed for sale under any letters-patent, or trade-mark, or which, if prepared by any formula, published or unpublished, are held out or recommended to the public by the makers, venders or proprietors thereof as proprietary medicines, or medicinal proprietary articles or preparations, or as remedies or specifics for any disease, diseases or affection whatever affecting the human or animal body. . . . ”

This is seen to be a comprehensive list, covering quite thoroughly the entire field of pharmaceutical preparations.

Section 20 of the law, however, containing the penal clause, has also a proviso which makes certain exemptions from Schedule B, and at the same time extends the scope of the law, as follows:

“Provided: That no stamp tax shall be imposed upon any un-compounded medicinal drug or chemical, nor upon any medicine sold to or for the use of any person which may be mixed or compounded for said person according to the written recipe or prescription of any practising physician or surgeon, or which may be put up or compounded for said person by a druggist or pharmacist selling at retail only. The stamp taxes provided for in Schedule B of this Act shall apply to all medicinal articles compounded by any formula, published or unpublished, which are put up in style or manner similar to that of patent, trade-mark or proprietary medicine in general, or which are advertised on the package or otherwise as remedies or specifics for any ailment, or as having any special claim to merit, or to any peculiar advantage in mode of preparation, quality, use or effect.”

It will be seen that the first paragraph of this proviso has the effect of restricting the scope of Schedule B; first, by exempting *uncompounded* drugs and chemicals, and, second, by exempting compounded preparations when prepared by direction of a physician. The last paragraph, on the other hand, *extends* the scope of Schedule B, by applying it to preparations which, though not patent, trade-mark or proprietary medicines, are “put up in style or manner similar to proprietary medicines in general.”

The first regulations issued by the Commissioner of Internal Revenue in execution of the Act made no attempt to define what was or was not an “uncompounded drug or chemical,” the ambiguous character of this term having been early recognized. In fact, this question was not raised, the earlier contentions in regard to the scope of the law having been mainly with pharmacists and pharmaceutical manufacturers over the interpretation of the phrase, “put up in style or manner similar to patent, trade-mark, or proprietary medicines in general.”

Several months after the law was in operation, some of the importers of the class of medicines known as patented synthetics made a move upon the Internal Revenue Office, claiming exemption for their medicines as uncompounded chemicals, and rebate of tax upon such as had been sold. The Commissioner refused to so consider them, and the contention was taken into court upon a sort

of an agreed case, the proceedings being in the nature of an action *in rem*, against twelve articles of this class, viz., aristol, phenacetin, europhen, piperazine, protargol, losophan, lycetol, sulphonal, tannigen, tannipine, trional and salophen, all products of the Farbenfabriken of Elberfeld Co. A jury trial was waived and testimony taken before the District Judge of the Southern District of New York.

It was admitted that the articles in question were trade-marked or patented, or both, but it was claimed that they were exempt under the proviso, as un-compounded chemicals.

A large number of experts testified in the case, including persons prominent in chemistry, pharmacy and medicine. By these experts, the importers aimed to show that while the articles in question were known as chemical *compounds*, they were not *compounded* in the sense in which the word is used in medicine and pharmacy; that, while composed of different elements, these elements were combined in such a way that the constituents had lost their individualities, while the compound acquired a being or individuality entirely its own, with characteristics and properties peculiar to itself and distinct from other compounds—different and distinct also from the properties of the various constituents of which it was composed. In pharmacy, on the other hand, it was shown that *compounding* is understood to mean the mechanical mixing of two or more different substances where no chemical union takes place, the resultant compound having no distinctive features peculiar to itself, but retaining the characters of all its constituents.

The Government, while admitting in general the contentions above stated, argued that the design of Congress was to tax, primarily, *proprietary* medicines, even to the extent of including medicines which imitated or counterfeited proprietary medicines; that this object would be defeated if the desired construction was placed upon the law, as it would result in relieving a medicine which could be designated as an un-compounded chemical from any restriction whatever, so that quinine, for example, could be sold unstamped as "Smith's Ague Cure," or under any patent or trade-mark designation, so long as it were unmixed with other substances. Moreover, Congress deals with broad and general meanings, and could not be expected to note such delicate distinctions as that between *chemical* compounding and *pharmaceutical* compounding, between cohesion

and chemical attraction. The court upheld the technical construction of the law, and decided the articles in question to be exempt from tax. The decision (published as Treasury Decision No. 20634; 91 Fed. Rep., 608) is quite a clear and comprehensive discussion of the disputed points, and marks out, with a considerable degree of exactness, the distinction between a *compounded* and *uncompounded chemical*, basing it entirely upon the question whether the substance in question is or is not a distinct chemical species unmixed with any other substance. It is worthy of note, however, as an indication of the difficulty experienced by a layman in dealing with the extensive field of substances used in medicine, that Justice Brown, in his decision, classes *opium* with quinine as a chemical compound, while he puts *alkaloids* along with tinctures, extracts, etc., in the category of pharmaceutical compounds. Little light is thrown upon the more difficult question of the definition of an uncompounded *drug* as distinguished from an uncompounded *chemical*.

The decision was accepted by the Commissioner of Internal Revenue, and regulations issued in accordance therewith, providing for the submission, in the case of an article claiming exemption, of a sample for chemical analysis or examination, the result to govern the action of the office in the premises.

These samples have occupied a large share of the time of the Chemical Division of the Internal Revenue Office during the past year, the analytical work having been performed chiefly by Mr. Simons. A complete ultimate analysis was not found necessary in any case, the estimation of the nitrogen in bodies containing it, of halides or metallic bases in others, together with the determination of melting points, solubilities and other characteristics, usually serving to establish the identity and individuality of a chemical, although it will be seen that each sample required a separate investigation and study, in some cases constituting quite a puzzle, as chemical literature is very scant concerning them. The work has been interesting in many ways, however, more particularly on account of the interest attaching to the preparations as representing the products of the skill of the synthetic chemist.

It would be highly interesting, no doubt, to make a study of the class from any one of three different points of view, of the chemist, the pharmacist or the physician, but such a presentation of the subject would be entirely outside the limits of our time, and we aim

to give you to-night only a general idea of the work we have been doing. Most of you are doubtless aware of the marvellous rapidity which has marked the development of the use of this class of remedies in medicine, and the consequent increase in the variety of different compounds discovered and manufactured for such use. Antipyrin was about the first to attract general attention, and, as the patent on this has recently expired, it will be seen that all have been originated within the past fifteen years.

The contention over the construction of the act, which we have previously described, affords, in itself, a further illustration of the very recent origin of the class, in this way; the language of Section 20 of the Act, including the phrase "uncompounded chemicals," was taken almost word for word from the old War Revenue Act, the proprietary medicine feature of which was repealed in 1883; during the operation of that Act no question was ever raised as to the exemption of proprietary medicinal articles as uncompounded chemicals, for the very good reason that, as we have seen, there were no chemical compounds which were patented or proprietary, the large class of patented synthetic chemicals having been originated subsequent to the repeal of the law.

The extent and variety of their present use may be well shown by the size of these reference books, Coblenz and Thoms, which are merely lists of the remedies in question, giving very briefly the principal characteristics of each substance with no extended description.

Coming now to our work on these chemicals, the following list of medicinal articles represents those which have been examined, and having been found to be definite chemical compounds, are, therefore, uncompounded chemicals, and exempt from payment of tax as proprietary remedies (Treasury Decisions, No. 21,875).

Acid carbohc Merck (phenol).

Agathin (salicyl-methyl-phenyl-hydrazone).

Airol (bismuth oxy-iodo-gallate).

Alumhol (beta-naphthol-disulphonate of aluminum).

Antifebrin (acetanilid).

Antiseptic credé (citrate of silver).

Apolysin (mono-phenetid in citric acid).

Aristol (di-iodo-dithymol).

Baking soda (bicarbonate of soda), Arm & Hammer brand.

- Baking soda, Cow brand.
Benzosol (guaiacol benzoate).
Beta-eucaine (hydrochloride of benzoyl-vinyl-diaceton-alkamin).
Blennostasine (cinchonidine dibromide).
Bromalin (hexamethylene-tetramine-brom-ethylate).
Chloralamid (chloral-formamid).
Dermatol (bismuth subgallate).
Dithion (dithiosalicylate of soda II).
Duotal (guaiacol carbonate).
Eudoxine (bismuth salt of tetraiodo-phenolphthalein).
Euphthalmine (hydrochloride of methyl-vinyl-diacetone-alkamine-phenyl-glycolyl).
Euphorine (phenyl-urethane).
Euquinine (ethyl-carbonic ester of quinine).
Europhen (isobutyl-ortho-cresol-iodid).
Exalgine (methyl-acetanilid).
Ferropyrine or ferripyryne (ferric-chloride-antipyryne).
Formalin (solution of formaldehyd).
Geosot (guaiacol valerianate).
Guaiacol-salol (guaiacol salicylate).
Guajacetin (pyro-catechin-mono-acetic acid).
Guaiquin (quinine guaiacol-bisulphonate).
Heroin (acetic ester of morphine).
Holocain (para-diethoxy ethenyl-diphenyl-amidin hydrochloride).
Hydrogen dioxide, Oakland brand.
Hypnal (mono-chloral-antipyryrin).
Iodole (tetra-iodo-pyrrol).
Kryofine (methyl-glycollic-phenetidin).
Lactophenin (lactyl-phenetidin).
Losophan (tri-iodo-meta-cresol).
Lycetol (dimethyl-piperazin tartrate).
Lysidine (methyl-glyoxalidin, solution in water).
Neurodin (acetyl-p-oxy-phenyl-urethane).
Oleoguaiacol (guaiacol oleate).
Orphol (beta-naphtholate of bismuth).
Orthoform hydrochloride (methyl-para-amido-meta-oxybenzoic hydrochloride).
Orthoform, new (methyl-meta-amido-para-oxy-benzoate).
Parachlor-salol (salicylate of chlor-phenol).

- Paraform (para-formaldehyd).
Phenacetin (para-acet-phenetid).
Phenocoll hydrochloride (amido-aceto-para-phenetid hydrochloride).
Piperazine (diethylene-diamin).
Protargol (silver and albumen).
Pyoktanin yellow (imido-tetramethyl-di-p-amido-diphenyl-methan chloride).
Pyramidon (di-methyl-amido-phenyl-dimethyl-pyrazolon).
Pyrodin (acetyl-phenyl-hydrazin).
Quinalgen (ortho-oxyethyl-alpha-benzoyl-amido-quinolin).
Salacetol (salicyl-acetol).
Salipyrin (salicylate of antipyrin).
Salol (phenyl salicylate).
Salophen (aceto-para-amido-salol).
Soziodole mercury (soziodolate of mercury).
Soziodole sodium (di-iodo-para-phenol-sulphonate of sodium).
Soziodole zinc (soziodolate of zinc).
Sulphonal (diethyl-sulphon-dimethyl-methan).
Stypticin (cotarnine hydrochlorate).
Tannoform (methylene-ditannin).
Tannigen (diacetyl-tannin).
Tannopine (hexamethylene-tetramine-tannin).
Thermodin (acetyl-para-ethoxy-phenyl-urethane).
Trional (di-ethyl-sulphone-methyl-ethyl-methan).
Triphenin (propionyl-phenetid).
Tussol (antipyrin mandelate).
Urotropin (hexa-methylene-tetramine).
Water, distilled.
Xeroform (tribrom-carbolate of bismuth).

The pharmaceutical profession has been discussing of late the propriety and advisability of admitting some of the patented synthetics to the U. S. Pharmacopœia at the next (1900) decennial revision. Should this be done, it is likely that only such as have been shown to have a definite chemical structure, together with valuable medicinal properties, would be recognized in this way, and the work represented by the foregoing list may prove of some value in that connection as well.

It would seem, at first sight, a very simple proposition to deter-

mine whether a substance in hand is or is not a definite chemical species or entity. With most of the chemicals examined, it is true, no serious difficulty was experienced. A substance like phenacetin, for instance, having a definite chemical formula, crystalline in form, with a well-defined melting-point and characteristic reactions, gave us very little trouble, but it was by no means such clear sailing with less definite substances; and, thinking that, perhaps, you would find a hasty review of some of the articles which failed to pass the ordeal more interesting than those which did, we have brought a number of the latter, and will show them to you, with an explanation of the reasons for rejection in each case.

The Commissioner of Internal Revenue is inclined to hew pretty close to the line, and exempt no proprietary remedy under the proviso which is not clearly and fully entitled to it under the terms of the decision of the Court. This being the case, a rather rigid standard was adhered to, and quite a number of medicinal chemicals failed to answer its requirements.

Many preparations which are classed in the trade as synthetic remedies, and included in the lists given by Coblenz and Thoms, are very far from being definite bodies, pure and unmixed with any other substance whatever. *Ichthyol* and *Tumenol*, for example, are products obtained by treating mineral oil with sulphuric acid, whereby sulphones and sulphonic acids of the various unsaturated hydrocarbons present in the oil are produced. While both preparations contain sulphur in organic combination, and are doubtless valuable in medicine, they are mixtures, not only of the sulphones of different hydrocarbons, but even of the different classes of bodies, sulphones and sulphonic acids, as shown by the following figures, hence they are not definite bodies:

	Ichthyol. Per Cent.	Tumenol. Per Cent.
Loss at 100° C.	43'09	6'32
Ash	0'03	9'28
Extracted by alcohol (sulphonic acids)	50'21	46'09
Insoluble in alcohol (sulphones)	6'30	38'31
Totals	99'63	100'00

Somewhat similar is the case of albuminoid or proteid bodies, and combinations of such bodies with different bases and acids. Hemol, hemogallol, ferratin, iron somatose, tannalbin, argonin, etc., are examples. Iron, for instance, enters into chemical combination

with proteid bodies, and the combinations formed are very stable ones; but that a preparation made by treating egg albumin with an iron salt produces a single definite chemical compound is altogether improbable. In fact, it is disproved by the very variable quantity of combined iron found in such preparations, as will be seen by the analyses which follow. No proteid bodies, therefore, have been exempted except one, protargol, this having been included with the articles passed upon in Justice Brown's decision.

	Per Cent. Total Proteids N X 6'25	Per Cent. Iron Fe
Ferratin	89'25	7'18
Iron somatose	84'87	1'52
Hemol	88'81	0'30
Hemogallol	89'94	0'26

Some of the difficulties experienced in marking out the line of division between compounded and un-compounded chemicals may be illustrated by the two closely allied preparations called *creosotal* and *duotal*. The latter, being the carbonate of a single definite body, viz., guaiacol, is itself definite, having a crystalline structure and constant melting point. It is, therefore, a distinct chemical compound and entitled to exemption. Creosotal, on the other hand, is prepared by the action of phosgene gas upon beechwood creosote. It contains, therefore, carbonates of the various phenoid bodies contained in creosote, consequently is a mixture of different substances in indefinite proportions, and *not* an un-compounded chemical.

Pyoktanin blue and *pyoktanin yellow* are two aniline dyes used in medicine. The yellow is exempt, being a single definite chemical compound; the blue is not, being a mixture of the hydrochlorides of penta and hexa methyl para rosaniline.

Two very interesting preparations used in latter-day medicine are colloidal silver and mercury, known under the trade names of *collargolum* and *hyrgolum*, respectively. In both preparations the intention has been to produce the metal in a colloidal state, the advantage for medicinal purposes being the solubility in water of metals in this condition. Colloidal silver or mercury would, of course, fully answer the requirements of the definition of a distinct chemical entity, being simple elements. Upon examination, however, the samples submitted were found to contain such considerable pro-

portions of other chemicals as impurities incident to the process of preparation, some of which have, moreover, decided therapeutic properties of their own, that they cannot possibly be considered as pure silver or mercury. As these preparations have considerable interest in themselves, and much attention has been paid in the journals recently to metals in the colloidal state, we give the results of analysis in full. A large percentage of the metals had reverted to the ordinary, or insoluble form. According to the latest theory in regard to colloidal metals they are in a state of emulsion, as it were, and the impurities are necessary to keep the minute particles of the metal in suspension.—(*Four. Soc. Chem. Ind.*, 1899, 18-1129.)

COLLARGOLUM.

	Per Cent.
Water (loss at 100° C.)	2'32
Silver (Ag)	84'05
Iron (Fe)	1'39
Equivalent to ferrous tartrate	5'06
Ammonia (NH ₃)	2'25
Equivalent to ammonium tartrate	7'42
	<hr/>
	98'85
Soluble in water	25'28
Insoluble in water	74'72
	<hr/>
	100'00

HYRGOLUM.

Mercury (Hg)	70'47
Tin (Sn)	8'60
Equivalent to colloidal stannic acid	12'22
Ammonia (NH ₃)	3'22
Equivalent to ammonium citrate	15'33
Water, etc. (by difference)	1'98
	<hr/>
	100'00

Diurctin represents a class of preparations in which the application of the usual test of a definite chemical formula would appear to entitle them to exemption. It is prepared by mixing solutions of the sodium salt of theobromine and sodium salicylate in the proper molecular proportions to form a double salt, and evaporating to dryness. The manufacturers claim that a definite compound is produced, but the combination, if any, is a very weak one. The presence of free theobromine is also shown by its extraction with a solvent.

Similar preparations are Uropherin S and Uropherin B, the analyses of which follow. We think chemists will agree with us in considering such preparations as mixtures.

DIURETIN.		Per Cent.
Water (loss at 50° C.)		0·85
Sodium theobromate		53·40
“ salicylate		42·30
Extracted by chloroform		2·13
		98·68

UROPHERIN S.		
Water (loss at 50° C.)		0·93
Lithium theobromate		54·23
“ salicylate		41·99
Theobromine extracted by chloroform		1·87
		99·02

UROPHERIN B.		
Water (loss at 50° C.)		0·25
Lithium theobromate		56·58
“ benzoate		38·45
Theobromine extracted by chloroform		2·34
		97·62

The remaining preparations which we will bring to your attention are of the nature of “frauds” of variable dimensions, and indicate that charlatanism in medicine is not entirely confined to the remedies sold to the general public. They are offered for sale to the medical profession only, purport to be of definite composition—a formula being given in some cases—and are provided with a trademark name suggestive of either pathologic conditions or chemical components, after the manner of synthetic remedies. Acetanilid seems to be a favorite ingredient, appearing in preparations intended for topical use, as well as in those recommended for internal administration as antipyretics.

Phenalgin is a preparation which is described on the label as “phospho-ammonio-phenylacetamide.” It is the ordinary type of “headache powder,” as will be seen by the analysis :

	Per Cent.
Acetanilid	67·38
Sodium bicarbonate	28·20
“ carbonate	1·34
Ammonium carbonate	0·80
Moisture (by difference)	2·28
	100·00

Febrinol is a preparation of very similar composition, although it is held out to the profession as "methyl-para-acet-phenetidin." There is a compound corresponding to this designation, listed by Coblenz as methyl phenacetin, and stated to have hypnotic properties. It is not known to us, but is stated to have a melting point of 40° C., while the crystalline substance extracted by ether from febrinol melts at 112° C., and is, in fact, acetanilid. Following is the complete analysis of febrinol:

	Per Cent.
Acetanilid	49'79
Sodium bicarbonate	34'28
" carbonate	4'03
Sugar	11'59
	99'69

Puronal is held out as a valuable remedy for external use on ulcers, etc., and internally in fermentative conditions of the alimentary canal. It is described on the label as "The tetra methylate of phenol, iodine and bismuth." Analysis gave the following results:

	Per Cent.
Acetanilid	97'22
Bismuth oxyiodide	2'35
	99'57

Phaccine is described in literature accompanying it as "sulpho-metadihydroxy benzene," with the formula $C_6H_4(OH)_2SO_4$. Its composition is as follows:

	Per Cent.
Resorcinol — $C_6H_4(OH)_2$	81'30
Zinc sulphocarbolate	18'45
	99'75

Iatrol is a preparation held out as a substitute for iodoform. It is described by Coblenz as "oxy-iodo-methyl-anilid, obtained by the action of iodine on an aniline derivative." Thoms gives it the same designation, but says that little is known of the details of its preparation. Both authors must have accepted the statements of the manufacturers as to its composition, for no such constitution can be made out from the sample we examined. It has a melting point of 112° C., and gives all the reactions of acetanilid. The percentage of nitrogen is 10.23, corresponding to 98.65 per cent. acetanilid. On shaking with carbon disulphide, a slight trace of iodine was obtained, which may come from a minute addition of aristol, as it seems to have the faint odor of that substance.

CROCUS AND SOME OF ITS ADULTERANTS.

BY WILLIAM STAIR WEAKLEY.

The following studies were carried out in the Botanical Laboratory of the Philadelphia College of Pharmacy at the suggestion of Professor Henry Kraemer, and to whom I am indebted for suggestions in regard to the work. The studies are based upon natural specimens of *Crocus sativus*, L., grown in Lancaster County, Pa., which were furnished by Mr. Joseph L. Lemberger, of Lebanon; and upon herbarium specimens of *Calendula officinalis*, L., and *Carthamus tinctorius*, L., in the Martindale Herbarium of the Philadelphia College of Pharmacy.

Crocus Sativus, Linné.—The two parts of the illustration, as given in Plate I, represent a longitudinal section of the plant, so as to show more fully its internal structure from roots to stigma.

In the plant we find the roots originating in the lower half of the corm and penetrating through its tissues and passing into the soil (see 8). Around the epidermis of the living corm are found numerous brownish-colored layers with fine longitudinal fibres. These layers represent the remains of previous years' growth (see 7). The leaves arise at the apex near the centre of the corm, are nearly erect and surrounded by a sheath of membranous scales. These leaves vary in number from six to nine, are 4-5 inches long, linear, acute, entire, stiff, curved outwards, smooth, shining, deep green, with a white depressed midrib; sessile and form an erect tuft which is closely invested in its lower part by four or five large, broad, thin, tough, membranous, sheathing scales.

The flowers may be either solitary or two together, and are borne on an erect short scape from a leaf axil, closely enveloped by a delicate membranous sheath which is trifid at the apex, presenting a somewhat serrate appearance, and it being delicately veined and united near its base.

The stamens are three in number and are inserted in the mouth of the tube opposite the outer segments; the anthers are linear, longer than the filaments, sagittate at the base, blunt at apex (see 4) and of a bright orange-yellow color. It may be noted that Carson, in his Medical Botany, figures the innate anthers as having an acute apex. On the contrary, they are blunt with somewhat rounded edges.

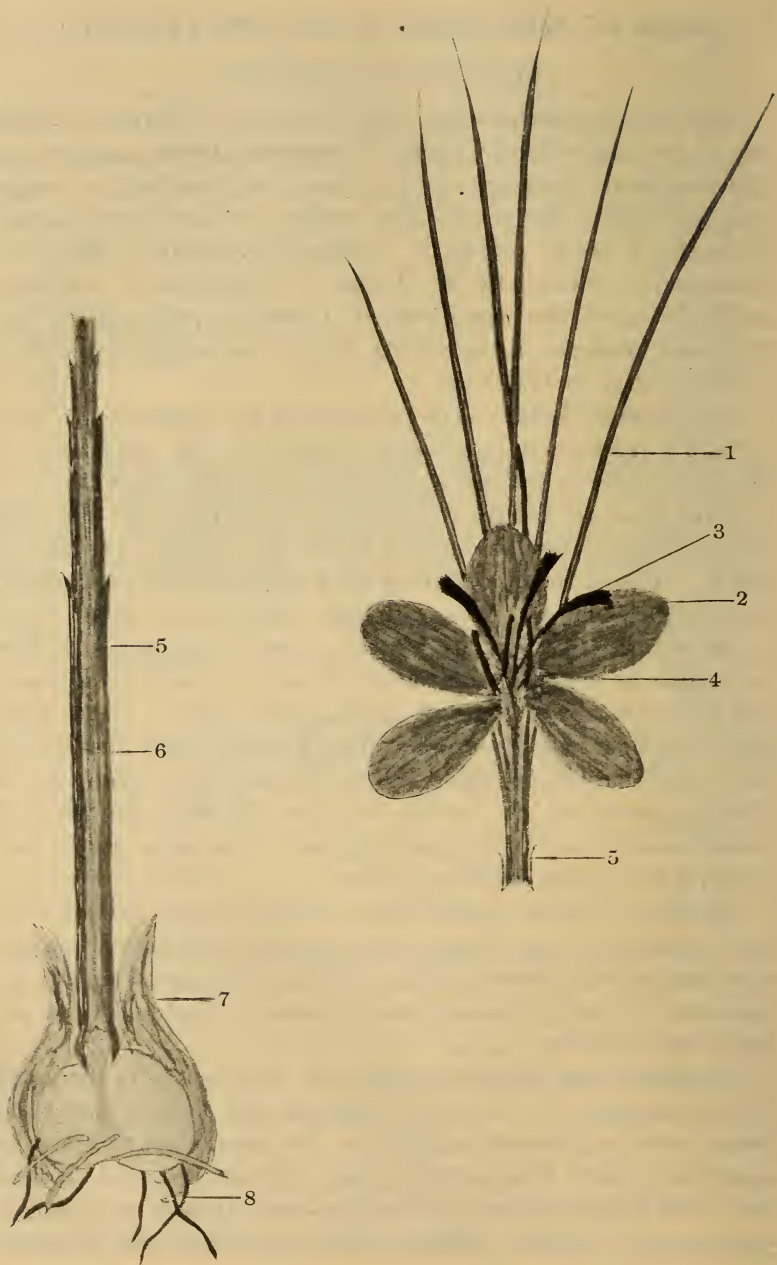


PLATE I.—Longitudinal section through the entire plant of *Crocus sativus*, L.

The style is long and slender, and at about the level of the base of the anthers it bears the three parted stigmas (see 3), each of which is tubular, dilated, often notched along one side and of an orange-carmine color.

The principal characteristics distinguishing crocus, calendula and carthamus have already been given in a paper by Henry Kraemer (*Proc. Penn. Pharm. Assoc.*, 1898; also this JOURNAL, 1898, p. 386). Drawings of these characteristics are given in Plate II. These drugs, when pure and placed under the microscope, may be recognized by their color alone, but when adulterated a careful microscopical examination is necessary.

The group of figures under A represent the chief characteristics of powdered crocus, in which is shown the papillæ present on the apex of the stigma, together with the pollen grains, which are few in number, scattered throughout the field; they possess numerous fine prickles, and have a diameter of 98.175 mikrons, with a wall 4.462 mikrons thick, there being found a few with abnormally large prickles. A grain is also shown just prior to the germination of the pollen tubes, the number of projections found in eight mounts never exceeded two, which was found in but one instance, and but few were found having one tube formed, the remaining ones being characterized by freedom from exuding tubes, and in possessing a spherical shape; not infrequently do we find small yellow oil globules adhering to these grains. There is also herein shown the dotted and striated appearance of the cells of a fragment of the anther.

The figures in the group B represent the chief characteristics of powdered calendula, in which is shown elongated cells having a wavy cell wall, in the cells of which are found yellowish oil globules.

The pollen grains in this drug are somewhat more numerous than in crocus, and differ quite widely as to their spinose character, the long pointed spines systematically alternate with each other when focused upon, and measure 3.57 mikrons. The grains have a diameter of 32.13 mikrons, with a wall of 3.57 mikrons. A grain in process of germination is also shown, which is characterized in being triangular in outline, and having three points of egress for the germinating grain.

The chief characteristics present in powdered carthamus, as shown by the figures in group C, are the sienna-brown laticiferous

vessels running lengthwise throughout portions of the flower, between which are found the spiral ducts, the whole being surrounded by numerous, matted, one-celled, colorless hairs.

The shape of the pollen grains, some of which are elliptical, together with the large number of grains present in this powder,

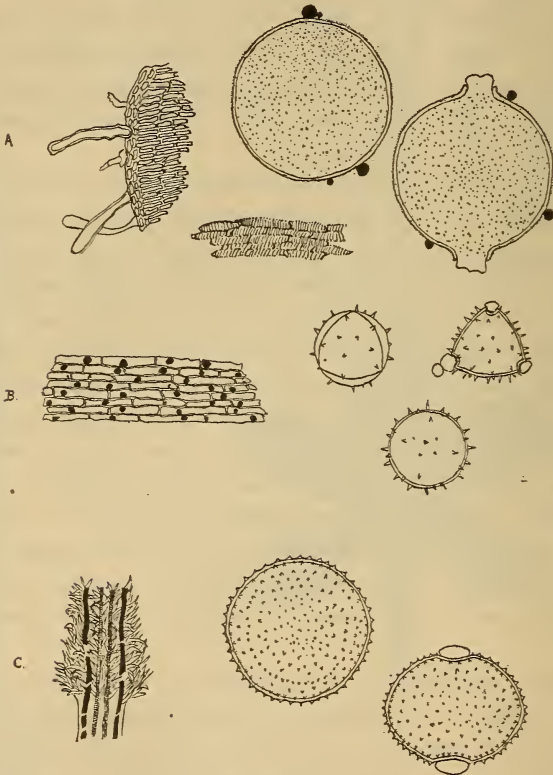


PLATE II.—A, Fragments of stigma and anther and pollen grains of *Crocus sativus*, L.; B, fragment of corolla and several pollen grains of *Calendula officinalis*, L.; C, fragment of corolla and some pollen grains of *Carthamus tinctorius*, L.

forms a very striking characteristic; they possess spines somewhat shorter than those of calendula, but more numerous; also differing from those of the latter in that their method of arrangement is scattered, these spines measuring 2·38 mikrons, the grain having a diameter of 60·69 mikrons, with a wall of 3·57 mikrons.

VALUATION OF CROCUS.

The object of this part of the investigation was to ascertain the degree of purity that can be met in good commercial saffron. It was considered that the U.S.P. definition, requiring the drug to consist of stigmas only, was too stringent and not practicable, as the style and other parts of the flower were likely to be present, not intentionally, but rather by reason of difficulty in collecting stigmas only.

The micro-chemical valuation, as suggested by Professor Kraemer, was carried out in the following manner: From six or eight different parts of the sample were taken small portions of the drug (about 5 grammes), these were then mixed, after which 100 pieces were counted out at random to be tested; a suitable number of these pieces were then laid upon a slide and sulphuric acid C.P. added, those giving the characteristic blue color reaction noted, the number of which is compared to those giving other than a blue coloration, and the percentage of adulteration estimated.

In the examination of twelve commercial specimens by the above test, the following results were noted:

	Blue with Sulphuric Acid.	Coloration other than Blue.
I	90	10
2	68	32
3	86	14
4	78	22
5	82	18
6	74	26
7	88	12
8	48	52
9	46	54
10	spurious.	
11	"	
12	carthamus.	

The results thus obtained indicate that the purest samples of crocus upon the market are but 90 per cent. pure; *i. e.*, contain but 90 per cent. stigmas, as required by the U.S.P.

Two other samples obtained from different sections of Lancaster County were absolutely pure and free from any admixture, either mineral or organic.

The materials present in the first seven samples examined were, besides stigmas, fragments of yellow anthers and styles.

No. 8, labelled Alicanth saffron, was found to be adulterated with some portion of another plant, together with quite an appreciable quantity of adhering barium sulphate. The coloring matter present dissolved with a red color in sulphuric acid.

No. 9.—The adulteration here present turned brown with sulphuric acid and contained a coloring matter soluble in dilute alcohol, imparting to this solvent a magenta color. The pollen grains present measured 99.96 mikrons in diameter, having a wall of 7.14 mikrons in thickness and finely spinose, the chromoplastids ranging from 1.19–1.47 mikrons in diameter. The pollen grains were colored purplish-red, a portion of the coloring matter having been absorbed, which thus gave conclusive evidence of a prepared and intentional adulteration.

No. 10.—This sample was labelled German saffron, and possessed a somewhat tea-like odor, with a brownish-red coloring matter soluble in dilute alcohol.

The few pollen grains which were present had a diameter of 39.27 mikrons, possessing numerous spines 7.14 mikrons long and a wall of 2.38 mikrons.

Upon the addition of sulphuric acid to this sample it gradually turned a seal-brown.

No. 11.—This sample presented in bulk about the same appearance as the previous sample, although in detail it differed from the former in that the pollen grains were absent, and with sulphuric acid it turned brownish-black, gradually becoming darker and disintegrating with slight pressure. The coloring matter present was insoluble in dilute alcohol.

In order to determine the coloring matter present in the adulterants of these samples, the tests given in Prescott's and in Allen's works on Organic Analysis were applied, but without success, not even a clue being found as to their identification. The failure at this point seemed to be due to the presence of the natural color in the undyed petal or a mixture of dye colors was used, thus vitiating the results.

In the case of No. 12, Spanish saffron was ordered and carthamus received instead.

Some possible adulterations of crocus were considered in the course of the work. The pollen grains with measurements, together with those of the chromoplastids and average size of petal are given.

All of these adulterations belong to the compositæ, two being cultivated varieties of chrysanthemum, and hence those most liable to be used by the dealer in trying to imitate the true drug by coloring matter and other available means.

Yellow chrysanthemum: Petal, 30 x 7 millimetres; pollen grains, 42.84 mikrons in diameter, with adhering oil globules; wall, 1.785 mikrons; spines, 1.785 mikrons, and chromoplastids, 2.677 mikrons.

Scarlet chrysanthemums: Petal, 32 x 5 millimetres; pollen grains, absent, and chromoplastids, 2.677 mikrons.

Sunflower: Petals, .40 x 10 millimetres; pollen grains, 32.13 mikrons in diameter; wall, 2.677 mikrons; spines, 4.462 mikrons, and chromoplastids, 3.57 to 4.462 mikrons.

SOLUBLE FERRIC PYROPHOSPHATE.

BY W. E. RIDENOUR.

Research Committee E, Pharmacopœia Revision.

The investigation herein presented was suggested by the statement of a very large pharmaceutical manufacturing firm, that no "Iron Pyrophosphate, Soluble," on the market would answer the U.S.P. requirements, especially in regard to the absence of orthophosphate.

A few years ago Dr. Julius Stieglitz¹ gave a very exhaustive paper on a method for distinguishing orthophosphoric acid from pyrophosphoric acid by the use of magnesium sulphate and acetic acid. In this connection the author mentioned that the soluble pyrophosphate of iron as found on the market varied to a marked degree, some of the samples examined containing only a trace of orthophosphate, while others showed the absence of any pyrophosphate; and in view of these results, asked the interesting question as to whether soluble pyrophosphate of iron reverts during the process of manufacture.

In 1892 F. A. Thompson² reported the examination of several samples of soluble pyrophosphate of iron according to the directions of the U.S.P., with the result that all contained orthophosphate.

J. B. Naglevoort³ favored Fresenius' method for the detection of

¹ AM. JOUR. PHARM., 1891, 585-593.

² *Proc. Am. Ph. Assoc.*, 1892, 259.

³ AM. JOUR. PHARM., 1895, 210.

orthophosphate in pyrophosphate, using limited quantities of magnesium sulphate and ammonium chloride.

With the above data before me, I collected a number of samples of iron pyrophosphate, soluble, taking only those for examination which could be secured in the original package. Seven samples were thus obtained and tested for orthophosphate according to the method of the U.S.P., which is as follows:

If 1 gramme of the salt be boiled with 10 c.c. of potassium or sodium hydrate, T. S., a reddish-brown precipitate will be produced, and if the colorless filtrate from this precipitate be strongly acidulated with hydrochloric acid, then magnesia mixture added, and subsequently a slight excess of ammonia water, no precipitate should be produced (distinction from and absence of ferric phosphate).

According to the above test, all the samples gave heavy precipitates, indicating, apparently, the presence of orthophosphate.

I here wish to call attention to a result of the examination, which developed while making the above tests. Samples Nos. 1, 4, 5 and 7 evolved a very strong odor of ammonia when treated with sodium or potassium hydrate, T. S., which indicates that the manufacturers from whom these samples were obtained are not making "*Ferri Pyrophosphas Solubilis*" according to the U.S.P., 1890, but for some reason are following a process official in the U.S.P., 1860 and 1870; according to which sodium phosphate was converted into the pyrophosphate, by moderately igniting it. This was then dissolved in water and mixed with a diluted solution of tersulphate of iron, when ferric pyrophosphate was precipitated. The precipitate was washed with cold water and dissolved in a solution of citrate of ammonium.

A sample of iron pyrophosphate was now prepared according to the directions of the U.S.P., 1890; the sodium pyrophosphate, prepared by myself, was free from orthophosphate by the ammonium molybdate test, as was also the finished iron salt. However, this product would not stand the U.S.P. test.

Here, apparently, was some discrepancy, and an effort was made to overcome the difficulty. The U.S.P. procedure was now modified by using varying proportions of magnesia mixture, but the results were unsatisfactory. Even sodium pyrophosphate, free from orthophosphate, by the ammonium molybdate test, indicated the presence of the latter by the magnesia mixture. This test was

therefore abandoned. In this connection I wish to call attention to an observation which I have not heretofore seen recorded, which is that magnesium phosphate and ammonium magnesium phosphate, freshly precipitated, are completely soluble in sodium pyrophosphate in large excess, and are not reprecipitated by ammonia, but by excess of the magnesium salt.

The following test, which is a slight modification of the one proposed by Stieglitz, was finally adopted as being most satisfactory. Very accurate results may be obtained with it by moderate care, and for this reason I recommend it to the notice of the Committee of Revision of our next Pharmacopœia.

Boil 1 gramme of the salt with 10 c.c. of potassium or sodium hydrate, T. S., to remove the iron. Filter, acidulate the colorless filtrate with hydrochloric acid, and add a slight excess of ammonia water and a solution of magnesium sulphate¹ so long as a precipitate is formed; slightly acidulate with acetic acid, boil and filter. The filtrate should give no precipitate upon adding ammonia water in slight excess.

The following results were obtained with the above test upon the samples collected:

No.	Author's Test for Orthophosphate.	Proved by Ammonium Molybdate Test.	Proved by Silver Nitrate.
1	Heavy precipitate	Heavy precipitate	Yellow precipitate
2	Very heavy precipitate	Very heavy precipitate	" "
3	Small " "	Small " "	" "
4	Heavy " "	Heavy " "	" "
5	Very heavy " "	Very heavy " "	" "
6	" " " "	" " " "	" "
7	Small " "	Small " "	" "
8	—	—	—
9	—	—	—

No. 8 was prepared by the author. No. 9 was handed the author by a fellow-chemist, and guaranteed to be free from orthophosphate.

It is thus proved that iron pyrophosphate soluble does not revert

¹ Magnesium sulphate, 10 grammes; ammonium chloride, 20 grammes, and water a sufficient quantity to make 120 c.c.

during the process of manufacture, and that the presence of orthophosphate is due to the carelessness of the operator in the making of the pyrophosphate of sodium.

Only two of the above samples claimed to be U.S.P. on the label, these being Nos. 2 and 6.

For examining iron phosphate soluble, the directions should read:

If 1 gramme of the salt be boiled with 10 c.c. of potassium or sodium hydrate, T.S., a reddish-brown precipitate will be produced, and, if the colorless filtrate from this precipitate be acidulated with hydrochloric acid, then a slight excess of ammonia water added, and a solution of magnesium sulphate (magnesium sulphate, 10 grammes; ammonium chloride, 20 grammes; water, a sufficient quantity to make 120 c.c.) added so long as a precipitate is formed, this precipitate should be completely soluble in acetic acid, added in slight excess, and not reprecipitated upon boiling.

FLORA FILIPPINENSIS.¹

In the Free Library of Philadelphia (Chestnut, above Twelfth), I found the celebrated *Flora Filipinensis*, by Blanco, Mercado and Llanos, edited by Naves and Villar, Manila, 1877-1880, in two big folios plates, and four folios text.

This flora will be found on the top floor, where the other rare and costly works are kept.

I give in the following a synopsis of contents (merely number of species in each family), which may come handy. The plates are fully the equal of any I have seen (colored), but not exactly arranged properly, and not provided with numbers.

- | | |
|-----------------------|-------------------------|
| 1. Dilleniaceæ (3), | 9. Pittosporaceæ (1), |
| 2. Magnoliaceæ (3), | 10. Caryophyllaceæ (1), |
| 3. Anonaceæ (8), | 11. Portulacæ (1), |
| 4. Menispermaceæ (1), | 12. Hypericineæ (2), |
| 5. Nymphaeaceæ (1), | 13. Guttiferæ (2), |
| 6. Papaveraceæ (1), | 14. Dipterocarpeæ (3), |
| 7. Capparideæ (7), | 15. Malvaceæ (18), |
| 8. Bixineæ (3), | 16. Sterculiaceæ (13), |

¹The above information was communicated by Mr. Hans M. Wilder to the editor, and it was thought that it might be useful to others.

17. Tiliaceæ (4),
 18. Malpighiaceæ (1),
 19. Geraniaceæ (3),
 20. Rutaceæ (7),
 21. Simarubeæ (1),
 22. Burseraceæ (1),
 23. Meliaceæ (6),
 24. Olacineæ (1) (what is that?),
 25. Celastrineæ (1),
 26. Rhanneæ (2),
 27. Ampelideæ (5),
 28. Sapiudaceæ (3),
 29. Anacardiaceæ (5),
 30. Moringeæ (1),
 31. Connaraceæ (1),
 32. Leguminosæ (66),
 33. Rosaceæ (2),
 34. Crassulaceæ (2),
 35. Rhizophoreæ (4),
 36. Combretaceæ (4),
 37. Myrtaceæ (8),
 38. Melastomaceæ (3),
 39. Lythrarieæ (5),
 40. Onagrariæ (1),
 41. Samidaceæ (2),
 42. Passifloræ (1),
 43. Cucurbitaceæ (10),
 44. Begoniaceæ (1),
 45. Cacteæ (1),
 46. Ficoideæ (1),
 47. Araliaceæ (1),
 48. Rubiaceæ (17),
 49. Compositæ (10),
 50. Goodenoviæ (1),
 51. Campanulaceæ (1),
 52. Plumbagineæ (1),
 53. Myrsinea (3),
 54. Sapotaceæ (4),
 55. Ebenaceæ (2),
 56. Oleaceæ (2),
 57. Apocynaceæ (14),
 58. Asclepiadaceæ (8),
 59. Gentianeæ (1),
 60. Borragineæ (6),
 61. Convolvulaceæ (13),
 62. Solanaceæ (11),
 63. Scrophularieæ (6),
 64. Bignoniaceæ (4),
 65. Pedalineæ (1),
 66. Acanthaceæ (10),
 67. Verbenaceæ (15),
 68. Labiataæ (8),
 69. Plantagineæ (1),
 70. Nyctagineæ (3),
 71. Amarantaceæ (7),
 72. Chenopodiaceæ (2),
 73. Polygonaceæ (1),
 74. Aristolochieæ (1),
 75. Piperaceæ (3),
 76. Laurineæ (2),
 77. Loranthaceæ (2),
 78. Santalaceæ (1),
 79. Euphorbiaceæ (22),
 80. Urticaceæ (15),
 81. Juglandæ (1),
 82. Cupuliferæ (2),
 83. Coniferæ (1),
 84. Scitamineæ (11),
 85. Orchideæ (7),
 86. Irideæ (2),
 87. Amaryllideæ (8),
 88. Bromeliaceæ (1),
 89. Liliaceæ (4),
 90. Pontederaceæ (1),
 91. Commelinaceæ (4),
 92. Palmæ (5),
 93. Pandaneæ (3),
 94. Aroideæ (4),
 95. Cyperaceæ (1),
 96. Gramineæ (7),
 97. Filices (1),
- Total, 483 plates.

ALL OXYMETHYLANTHRAQUINONES possess purgative properties, and Tschirch (*Arch. der Pharm.*, 1899, p. 632) suggests that they may well replace the natural drugs containing them, as rhubarb, etc. The trioxy-compounds (as emodin) are more powerful than the dioxy-compounds (as chrysophanic acid).

RECENT LITERATURE RELATING TO PHARMACY.

PERSIAN TOBACCO.

The Persians smoke a species of *Nicotiana*—probably *N. Persica*—which they call *tumbac*. M. R. Georgiades (*Bull. Soc. Phar. de Bordeaux*, 1899, 179) discusses this plant and its uses, referring to the native method of curing and the smoking of same through the *narghileh*—the oriental water pipe. The writer, desiring to know if the use of this species of wash bottle lessened the probability of absorption of nicotine by the smoker, estimated the alkaloid in the dry tobacco, in the wash liquor of the pipe, which is called the *nafas*, and lastly in the inhaled smoke, running the latter into a wash bottle containing water.

Assayed by the method of Schloesing, each 18 grammes of tobacco (a pipeful) showed 0.947 gramme nicotine, the *nafas* through which this quantity of tobacco was smoked showed 0.595 gramme nicotine, while the washed smoke from same amount contained but 0.0225 gramme.

The figures are of course approximate, but they show the value of such forms of nicotine absorbers.

The article contains analyses of moisture and salts in the *tumbac*—results similar to those from American tobacco.

H. V. ARNY.

A NEW REAGENT FOR MORPHINE.

Professor R. Kobert reports (*Ztschrift. Oest. Ap. Vereins*, 1899, 368) on the value of formalin—sulphuric acid (made by adding 2 or 3 drops formalin solution—40 per cent.—to 3 c.c. concentrated sulphuric acid)—as a watch-crystal color reagent for morphine and its derivatives. It colors morphine purple-red, then violet, then blue-violet, and finally pure blue. The solution gives an absorption spectrum from which the orange and yellow is extinguished.

The report gives the color modifications when dionine, codeine, heroine and peronine are employed. It is interesting that the reagent colors methylphen-morpholin a deep red. This substance has no medical properties in common with morphine, but is a decomposition product of same and an agent in synthesis of the alkaloid.

H. V. A.

PHILADELPHIA HOSPITAL FORMULARY.

Under the name Pharmacopœia of the Philadelphia Hospital, the formulæ used in the Philadelphia Hospital have been published in 1875, 1882 and 1888. The old title has been replaced by the above title. The present "Formulary" contains a revision of many of the original formulæ, as well as new formulæ of the newer remedies.

ELIXIRIA.

Elixir Acetanilidi.

Each teaspoonful contains :

Acetanilide	2'5 gr.	0'15 gm.
Spt. Ammon. Aromatic	15 m.	1 c.c.
Tr. Card. Comp.	15 m.	1 c.c.
Alcohol	15 m.	1 c.c.
Elixir, Orange, to measure	1 fl. dr.	4 c.c.

Dose : One teaspoonful.

Elixir Ferri, Quininæ et Strychninæ.

Each teaspoonful contains :

Iron Pyrophos.	2 gr.	0'13 gm.
Quinine Hydrochlor.	1 gr.	0'065 gm.
Strychnine Sulphate	$\frac{1}{64}$ gr.	0'001 gm.
Glycerin	10 m.	0'6 c.c.
Syrup	20 m.	1'2 c.c.
Elixir, Orange, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Elixir Glonoini.

Each teaspoonful contains :

Solution, Nitroglycerin (1 per cent.) 1 m. = $\frac{1}{100}$ gr. of Nitroglycerin	1 m.	0'06 c.c.
Elixir, Orange, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Elixir Potassii Arsenitis.

Each teaspoonful contains :

Sol. Potass. Arsenite, 2 m. = $\frac{1}{50}$ gr. of Arsenious Acid, with Potassium Bicarbonate	2 m.	0'12 c.c.
Tr. Card. Comp.	5 m.	0'3 c.c.
Elixir, Orange, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Elixir Strychninæ Arsenatis.

Each teaspoonful contains :

Strychnine Arsenate	$\frac{1}{64}$ gr.	0'001 gm.
Elixir, Orange, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

EMULSA.

Emulsum Olei Gaultheriæ.

Each teaspoonful contains :

Oil, Wintergreen	15 m.	1 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure	1 fl. dr.	4 c.c.

Dose : One-half to one teaspoonful.

Emulsum Olei Morrhuæ.

Each tablespoonful contains :

Oil, Cod Liver	2 fl. dr.	8 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia,		
Sugar, of each, sufficient.		
Water, to measure	4 fl. dr.	15 c.c.

Emulsum Olei Morrhuæ Cum Hypophos.

Each tablespoonful contains :

Oil, Cod Liver	1·5 fl. dr.	6 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia, of each, sufficient.		
Syrup, Hypophos.	1 fl. dr.	4 c.c.
Water, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Emulsum Olei Morrhuæ Cum Hypophos., Creosot.

Each tablespoonful contains :

Creosote	2 m.	0·12 c.c.
Emulsion, Cod Liver Oil and Hypophosphite, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Emulsum Olei Morrhuæ Cum Lactophos.

Each tablespoonful contains :

Oil, Cod Liver	1·5 fl. dr.	6 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia, of each, sufficient.		
Syr. Calcium Lactophos.	1 fl. dr.	4 c.c.
Water, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Emulsum Olei Terebinthinæ.

Each teaspoonful contains :

Oil, Turpentine	5 m.	0·3 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Emulsum Terebeni.

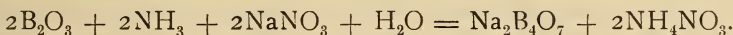
Each teaspoonful contains :

Terebene	3 m.	0·18 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

MANUFACTURE OF BORAX.

Boric acid, ammonia and sodium nitrate are mixed in the proportion indicated by the following equation :



Just sufficient water is added to dissolve the ingredients. The chemical reactions produce enough heat to warm the solution, which, on cooling, deposits crystals of borax. These are separated from the ammonium nitrate solution by means of a centrifugal machine.—Eng. Pat., No. 862, January 13, 1899. L. F. K.

ITALIAN BEESWAX.

A. Funaro gives the following constants for pure beeswax: Specific gravity, 0·961–0·964; melting-point, 63–64·4° C.; acid number, 21–22; saponification number, 91–96; index of refraction, 42–45°.—*L'Orosi*, 22, 109. L. F. K.

SODIUM HYPOCHLORITE CRYSTALS.

To obtain these, a solution containing about 400 grammes of available chlorine per litre is subjected to a low temperature, when a considerable deposit of crystals will take place.—Eng. Pat., No. 25,925, December 8, 1898. L. F. K.

A NEW INDICATOR.

A. E. Sunderland and A. E. Rhodes (*J. Soc. Dyers and Colorists*, 1899, 15, 206) recommend the diazo compound of para-nitranilide and propylmetacresol as an indicator in alkaline and acid work. It is a powder insoluble in water, but soluble in water containing 30 or more per cent. of alcohol. It can replace lacmoid in estimating the hardness of water; is more sensitive than phenolphthalein, is serviceable for organic acids and equal to methyl orange for estimating ammonia. It is, however, sensitive to carbonic acid and

the carbonates. It is said to surpass other indicators in sensibility and sharpness of end reaction. The color reaction is pink when alkaline and faint yellowish in an acid medium. L. F. K.

“PEREZOL,” A NEW INDICATOR.

Under the above name, Duyk describes a new indicator, which is derived from the rhizomes of a Mexican plant, *Perezia adnata*, by means of benzene or toluene. The proximate principle, pipitzaic acid, obtained by evaporating the above solvents from the extractive to crystallization and recrystallizing from the same, is a reddish-yellow crystal, melting at 67–70° C., sparingly soluble in water, alcohol, ether and oils. A ½ per cent. alcoholic solution is recommended. It is extremely sensitive to both fixed and volatile alkalis, and the end reaction is very sharp, even when highly diluted. Distilled water boiled in glass will give a distinct reaction. Alkaloids react with great delicacy with perezol, making it a valuable indicator for estimating these bodies volumetrically. Carbonic acid and organic acids deport themselves like mineral acids. Boric acid, however, acts like a base towards this indicator. Borates, acetates, carbonates and bicarbonates have an alkaline reaction, but the ammonia salts react neutral.—*Ann. de Chim. Analyt.*, 4, 372.

L. F. K.

A NEW SOURCE OF PILOCARPINE.

Rocher describes a new jaborandi *Pilocarpus racemosus*, indigenous in the French Antilles. The leaves contain about 1 per cent. of total alkaloids, of which 0.6 per cent. is pilocarpine and the remainder jaborine. The leaves also contain a greenish, very aromatic essential oil.—*Rep. de Pharm.*, 1899 (3), 11, 439.

L. F. K.

MANUFACTURE OF BARYTA.

H. H. Lake intimately mixes finely-powdered barium carbonate with about 8 per cent. of carbon, and places the mixture into a crucible lined with some vegetable fibre, like cardboard, which is also used to cover the same. The lid is luted down with earth, and the whole heated to 1,100° to 1,200° C. for ten hours. The evolving gases prevent ingress of air, which is essential. About 99 per cent. of the barium carbonate is transformed into the anhydrous baryta, from which the hydrate is easily obtained.—*Eng. Pat.*, No. 25,027, November 26, 1898.

L. F. K.

EDITORIAL.

THE OLD AND THE NEW PHARMACY.

If one takes the pains to compare the Proceedings of the American Pharmaceutical Association of recent years with those of twenty or twenty-five years ago, it is very apparent that the problems and affairs pertaining to pharmacy now are very different from what they were then.

The problems of a quasi-business character or those pertaining to the shop have been almost entirely replaced by more or less scientific investigations. We find that the collecting and preserving of drugs were then frequent subjects of papers; the Committee on Drug Markets, Adulterations and Sophistications of Drugs presented painstaking and valuable reports; graduated measures and general apparatus for chemical and pharmaceutical uses were chosen as themes for articles; the labelling of shop furniture, stock bottles and vials was a subject that was given closest attention; the devising of formulæ, with criticisms on the same, as well as useful notes on the Pharmacopœia and exhibitions of specimens, also tended to make the meetings peculiarly valuable to the retail pharmacist. If we look carefully into all of these contributions we find that it was the teachers and those closely allied with pharmaceutical colleges who were giving their best energies and unselfish labors for the benefit of the pharmacist. Since those days gradual changes have been taking place in pharmacy and necessarily in the character of the contents of the Proceedings of the American Pharmaceutical Association. Marked changes may be said to date, however, from the formation in the Association of the various sections on science, education, etc.

About this time a marked division of labor or specialization was developed, the manufacturers took up the problems relating to the furnishings and equipment of the pharmacy, and while one has supplied shop furniture, another has made a specialty of glassware, etc. At the same time the retail pharmacist has been supplied with drugs and preparations the purity of which was guaranteed by tests, etc., that he, for economic reasons, apparently could not well apply. The result has been that little by little the modern pharmacy has been converted in many instances into a shop in which some one else's preparations, be they patent or pharmacopœial, may be purchased. While the pharmacist is apparently not as independent as he was

some years ago, nevertheless it is evident, as indicated in the report of the Chairman of the Committee on Practical Pharmacy and Dispensing of the A.Ph.A. at the last meeting, that not only an equal degree of knowledge is required in the compounding of galenicals, but even a more intimate knowledge of the subjects involved, or, in other words, greater professional skill. When we consider what analytical and synthetical chemistry have given us in the nature of alkaloids, essential oils and new remedies, and when we look at the array of elegant, tasteless and at the same time efficient preparations furnished by galenical pharmacy, it is apparent that the pharmacist is no longer concerned in merely dispensing the more or less crude products of the vegetable and mineral kingdoms, but rather in dealing with those that are the products of the brain and skill of those engaged in the application of the sciences to modern pharmacy.

If no one scientist is master of even a very small part of a division of science, how little hope is there for a pharmacist of to-day to become a master of the different sciences the results of which are employed in the manufacture of the medicaments of to-day, and when we consider the number of experts who are engaged in devising new furniture, new apparatus, new preparations and medicaments involving a knowledge of the different departments of science, we expect the practical pharmacy and dispensing of to-day to be different from what they were some years ago.

Formerly the professor was intimately associated with the retail pharmacist and not infrequently had at least an interest in a retail store. In his work of instructing the students at college he collaborated the results of his own experience and those of others; he also instituted experiments and encouraged others in investigations relating to pharmacy. The teacher is now more concerned in expounding the principles and theories of the sciences than in working out the minor problems which his students and the pharmacists with their advanced training may and ought to do for themselves. At the same time the results of the investigations of the professor, as shown in the Proceedings of the A. Ph. A., of recent years indicate that his thoughts and energies are now in the direction of the applied sciences and arts. While the professional side of pharmacy has been advancing, as shown in the teachings of the colleges as well as by the report of the Chairman of the Committee

on Practical Pharmacy and Dispensing of the A. Ph. A., so have the opportunities for business enterprise been increasing. The retail pharmacist with a small monopoly of certain products has grown to be in many instances the successful manufacturer. Furthermore, the retail pharmacist of years ago doing a small business with large profits has been met in recent years by an increase in the number of pharmacies sharing these profits. We observe that the same principle which has obtained throughout the professional and business world also applies to the retail pharmacist.

While corporations have been organized, so have individual business enterprises been developed, each contributing its share to the welfare of the race. Unfortunately, many who have not adjusted themselves to existing conditions cannot but refer to the "good old times" and look painfully upon the present. All who fail to read the signs of the times and adapt themselves to the inevitable decrees of commerce find that during this adjustment period they are either partially or wholly losing their grip upon their profession and business. It is the wise man who benefits by the achievements made possible by corporations and yet observes the peculiar advantages of independent professional and business labors.

The retail pharmacist has, in the first place, been met by competition in the numbers who have entered the business solely because of the apparent "millions in it." Some of the more intelligent pharmacists soon recognized, in the supplying of the mediocre class who now swelled the ranks of pharmacy and who were incompetent to make their own preparations, that here was an unusual opportunity of supplying them with pharmaceutical products. This fact, as well as the natural development of the corporation, has made possible the condition which exists to-day.

The evolution of the retail pharmacist is in the direction of the manufacturer, and we witness the large number who either on a small or large scale have developed their business from small beginnings to large and even still greater manufacturing enterprises. The ambition of many college graduates is either to become associated in some way with a manufacturing firm, or himself to become a manufacturer.

Every pharmacist who is true to his profession makes as many of his medicaments as possible. Every pharmacist who makes any medicaments for other than his own use in filling prescriptions, etc.,

is a manufacturer. The more professional and educated the pharmacist is the more likely is he to become a manufacturer, the extent of the products of his manufacture depending upon his abilities and the money at his command. The pharmacist must recognize the inevitable current of commerce, and, according to the mariner he proves himself to be, so is his course either on the sands or rocks, or in the tide that leads him to his highest ambitions. So long as man inhabits the earth there will be sickness and disease, and physicians and pharmacists will be called upon to do their respective duties. With the advance of time there will be more specialization and the field with its opportunities will be larger to those who possess and manifest the true professional spirit. There will be more to satisfy the man with the interests of his profession, providing he recognizes first the situation which confronts him, then his own powers, and finally conducts his life and actions according to his reason and position. The whining pessimist who sees nothing but disaster in the future will be displaced by the high-souled professional man of character and purpose, be it in pharmacy or any other profession.

EDITORIAL NOTES AND COMMENTS.

NOMENCLATURE.

NOTES ON BOTANICAL NAMES.—The matter of the botanical nomenclature of the U.S.P. is of great importance, and while there is little doubt in the minds of the majority that Engler and Prantl should replace Bentham and Hooker as our authority, as already pointed out by Prof. H. H. Rusby, still it is a matter of some concern as to how far we are justified in following even Engler and Prantl as our guide. In a recent letter from Professor Rusby on this matter, which we are permitted to publish, he says:

“I would depart from the authority, however, in cases of obvious error, such as classing *Cimicifuga* as an *Actæa*. In regard to specific names, I would follow the Rochester code, except in matters of style, such as decapitalization. I can see no other road to uniformity and ultimate simplicity, and it appears that everything is working surely, even if slowly, in this direction. Several mistakes made by the last committee, for which I assume the responsibility, are to be

corrected. As to what changes will be required on the above basis, it is a mere matter of detail to work them out. I will here indicate a few which I have in mind, in addition to those enumerated in my A. Ph. A. paper.

“APOCYNUM.—Species wholly indefinite, and requires full pharmacological investigation.

“ASAFÆTIDA.—Add ‘and probably from other species of *Ferula*.’

“ASPIDOSPERMA.—I think it almost certain that more than one species yields the bark (of good quality) of commerce.

“ASPIDIUM?

“CASTANEA.—Write ‘*C. dentata* (Marsh.), Borkh.’

“CHONDRUS.—Worked out by Henry Kraemer. See ‘Proc. Pennsylvania Pharmaceutical Association,’ 1899; also AMER. JOUR. PHARM., 1899, p. 479.

“CINCHONA.—After *C. Calisaya* insert *C. Ledgeriana*.

“COCA.—I believe that the chemical and therapeutic differences are sufficient to warrant two titles for the Truxillo and Huanuco. Or else let cocaine represent the latter, and let the preparations be made from the former, and make it the official one.

“EUCALYPTUS.—I think it should be required that these come from their native home. They apparently differ greatly in quality, as coming from different places where they have been introduced.

“HEDEOMA.—The synonym should be ‘American Pennyroyal,’ and the same qualification should be applied to the oil.

“IPECACUANHA.—The relative properties of cephæline and emetine should be investigated, and the advisability of admitting the *Carthagenæ* be thus determined.

“KINO.—Eucalyptus gum is almost wholly sold for Kino, and it is probably even better.

“MENISPERMUM.—The Southern (Texan) is very likely specifically distinct from the Northern.

“MENTHA VIRIDIS should be written *M. spicata*, L.

“MENTHOL.—Holmes is author of the two variatal names involved. See B.P.

“PILOCARPUS.—Drop *P. Selloanus* and perhaps add one or more of the newly-discovered ones. Even then it will be hard enough to meet the demand.

“RHEUM.—The B.P. definition is correct.

“RUBUS.—Omit *R. Canadensis*.

“SERPENTARIA.—Add *A. Nashii*, Kearney.

“SPIGELIA.—Tropical species should be tested. They are apparently very good, and should be added. It will be hard enough, even then, to meet the demand with a genuine article.

“STROPHANTHUS.—Restrict to *S. Kombé*.

“VIBURNUM PRUNIFOLIUM.—Add *V. Lentago*.

“VIBURNUM OPULUS ought to be dropped.

“XANTHOXYLUM.—I think Engler is correct, as to the Southern species representing a different genus.”

MEDICAL NOMENCLATURE.—The nomenclature question in all the sciences and arts is one of the greatest moment. In medicine, apparently, it is in a similar chaotic condition. The terms used are at best only symptomatically descriptive, and it is conceded not without reason that medical nomenclature should have an etiological rather than a symptomatic basis.¹

In an extended communication on this subject, Dr. A. F. McKenzie² considers it likely that most new words of the future will be coined by medical men connected with the great medical centres where scientific research is carried on. In regard to the spelling of words, which is closely connected with the subject of nomenclature, the changes proposed by G. M. Gould³ some years ago have been adopted by many authors.

UNIVERSAL LANGUAGE IN MEDICINE.—While Latin is the recognized universal language in the sciences, it appears that in medicine each nation not only has its own home nomenclature, but has employed its own language in communicating the ideas of the physicians to one another as well as to other nations. Some have advised the adoption of the modern Greek as being suitable for a universal language in medicine. Dr. A. F. McKenzie² suggests that the English language, although probably greatly altered, may become the medium of exchange of ideas in medicine as well as in commerce. It is safe to say that a universal language must be the result of natural growth and fostered by influences outside of medicine.

ENGLISH ABBREVIATIONS.—In the Formulary of the Philadelphia Hospital, published on p. 131, of this JOURNAL, it will be noted that,

¹ *Southern California Practitioner*, 1898, p. 353.

² *Dominion Medical Monthly*, 1899, p. 233.

³ *Philadelphia Medical News*, 1893, June 17.

while the Latin titles of the formulas are retained, a system of English abbreviations has been adopted in indicating the names and quantities of the ingredients. The reason given for such a step is to diminish the false readings in prescriptions by the pharmacist. The plan that has been followed in the Formulary has been to give: (1) the *class* of medicinal products to be used, followed by (2) the *specific member* of the class. Thus Calomel is written: "Mercurous Chloride, Mild;" and Corrosive Sublimate is written: "Mercuric Chloride, Corrosive;" or, "Vallet's Mass" is given as: "Mass, Ferrous Carbonate," or Mucilage of Acacia as: "Mucilage, Acacia;" or Aromatic Sulphuric Acid as: "Ac. Sulph. Arom.;" or Compound Fluid Extract of Sarsaparilla as: "Ext. Sarsap. Comp. Fl.," etc.

There are two objections to this system as followed in the Philadelphia Hospital Formulary: (1) Inconsistency in nomenclature of title (in Latin), and names as well as quantities of ingredients (in English). (2) The important benefit from the universal comprehension and interpretation of Latin has been entirely disregarded.

This latter feature is one reason that calls for a more extended use of Latin and of the metric system in the United States, where not only English is spoken, but all the other languages.

A SCIENCE CRIPPLED BY WORDS.—Perhaps no one subject has been placed in such a false light and has yielded so little returns to the pharmacist as the study of botany. A number of causes have been at work, and Walter Bryan¹ believes it to be due to the use of such a large number of foreign descriptive words. Mr. Bryan suggests that these words be exchanged for English words, and believes that botany would be more readily assimilated and practically applied by the student and pharmacist. It is furthermore suggested that the U.S.P. substitute English descriptive words for the foreign botanical terms. This is a matter for serious consideration, and we cannot but agree with the author to a certain extent. We may discuss this subject later in some of its various aspects.

THE IDEAL PHARMACOPŒIA.

Much has already been written upon the coming U.S.P., and the editor of the *Pharmaceutical Review*² makes some very pertinent

¹ Paper read before the King's County Pharmaceutical Society, and contributed to the *Pharm. Era*, 1899, p. 570, for publication.

² *Pharm. Review*, 1900, p. 57.

remarks on the ideal pharmacopœia, which he considers to be "an up-to-date treatise that contains concise information with regard to every drug and preparation the modern physician may want to prescribe and which the pharmacist is called upon to dispense; not only of those which are regarded as 'sufficiently important to be made official.'

"The ideal pharmacopœia is one that changes with every step of scientific progress, the change to be made as rapidly as is consistent with good work and in doubtful cases with the best judgment of the Revision Committee. It is not at all necessary to revise the entire book each year or oftener. The new revised edition being published, the Committee should issue circulars with regard to changes or additions to be made. These could either be inserted into the book, so bound as to provide for such additions or changes, or at the end of each year an addendum could be issued comprising all of the information of the circulars. Whenever demanded, a new revised edition could be issued. There is no reason why pharmacopœias should not be completely revised as often as our present dispensatories."

THE WAR REVENUE TAX.

It is generally known that the normal receipts from the war tax are far in excess of what is necessary, and the public expect that Congress will certainly at this session at least amend the act creating this revenue so as to strike out those things that cause annoyance and trouble without producing very large revenues to the government. It ought to be said, moreover, that the tax on medicinal preparations falls with crushing weight upon the retail pharmacists of the country, and the resolutions adopted by the Chicago Retail Druggists' Association, at a meeting held January 30, 1900, speak really the sentiment of every retail druggist in the United States, and it is hoped that Congress will come to their relief. We have already referred to this matter editorially (see this *JOURNAL*, 1898, pp. 354 and 625), in the first case favoring the act, considering the emergencies of the case, and secondly recommending its amendment. The resolutions as adopted by the Chicago Retail Druggists' Association are as follows:

"*Resolved*, By the Chicago Retail Druggists' Association, representing 900 druggists of the city of Chicago, that there is no

longer any reasonable excuse for the further continuance of this unjust and oppressive tax; that said tax, unlike nearly all other taxes imposed by the Government, is not and cannot be shifted to the consumer; that said tax, so long as it is collected, is and must remain an enormous and discriminative burden upon the retail druggists, equivalent to an income tax upon them many times greater than the general income tax, proposed by the Act of 1894, but which, in a suit prosecuted by the financial interests of the East, was overthrown by the Supreme Court.

Resolved, That we earnestly petition Congress to repeal this vexatious and harassing tax. We especially urge our Senators and members from Illinois to use every means in their power to secure its repeal, and we ask them not to abate their efforts by reason of the specious arguments now being put forth by the advocates of big appropriations against such action at the present session. We ask them to consider that the first duty of Congress is to do justice; we ask them to remember that the levying of this tax involves the grossest injustice involved in any tax now levied by the Federal Government; we ask them not to forget that it falls for the most part upon a class of citizens who are already suffering under burdens and disabilities which render it difficult for them to make even expenses in their business.

Resolved, That a copy of these resolutions be transmitted to both Senators and to each member of Congress from Illinois, with the urgent request that they do everything in their power to induce the Ways and Means Committee of the House to report for passage at this session a bill to repeal this odious, obnoxious and oppressive tax."

ASAFETIDA IN THE UNITED STATES.

Owing to the importance attached to the commercial purity of asafetida at the present time (see this JOURNAL, 1900, p. 97), the editor of this JOURNAL has been in correspondence with some well-known firms in regard to the purity of this drug in the American market, and the following letter from Lehn & Fink, of New York City, places the matter clearly before our readers:

"DEAR SIR:—We acknowledge receipt of your favor of the 25th ult., in which you desire a statement from us whether a reduction of the limit of purity as established by the Pharmacopœia for 'Asafetida' is advisable.

"We see no necessity for such a reduction, as suitable grades are always in ample supply in the primary markets, and there is no difficulty in procuring sufficient quantities for use in medicine.

"As to the *commercial* aspect of the question, we beg to report as follows:

"The demand in this market from buyers of large quantities is mostly for a low-priced gum, such as does not meet the requirements of the U.S.P. Asafetida of this description is almost exclusively used for powdering, and, as it contains a large amount of mica and other inert material, is better adapted for this purpose than resinous gum of good quality.

"Jobbing druggists, who in turn supply the retail trade with the whole gum, usually buy good grades.

"There is no difficulty in obtaining asafetida containing 60 per cent. resin and over in the primary markets.

"No restrictions were formerly placed by the customs authorities on the quality that should be admitted to this country. Importers dealt in various grades suitable for various wants.

"The trouble began when the appraiser of the port of New York excluded asafetida not meeting pharmacopœial requirements, which he can do under the law of August 30, 1890, prohibiting the importation of adulterated merchandise. Importers had been accustomed to half-hearted attempts on the part of the appraiser to carry out this law, but they had learned by experience that such attempts, sometimes fully justified, sometimes not warranted, are soon given up and old customs prevail. When restrictions were first placed on asafetida, they were only enforced for a short time; later on importations of inferior grades were again allowed to come in. This state of affairs was embarrassing to some importers, who were quite willing to comply with the requirements established by the appraiser, and when, because of protests, the appraiser's office became more watchful, it still happened that examination of the quality of new arrivals was not carefully carried out, and some importers managed to bring in asafetida which was below standard, while others were compelled to return their shipments. At this stage some importers directed their shipments to ports other than New York, where the supervision was less strict, and this way obtained supplies of low-priced asafetida, for which there is always a good sale, as explained above. This caused those New York im-

porters who were not quite so 'smart' to again complain to the proper authorities, which had the effect of making importation through other ports more difficult. After all, the examination of new arrivals of gum asafetida is not strictly carried out in our opinion, as it has recently happened to us that part of a shipment was refused, although we were unable to detect any material difference in the quality of the rejected part and that which was admitted; in fact, the latter did not quite meet the requirements of the U.S.P.

"This unsettled state of affairs will continue as long as no strict supervision and exact method of examination of every importation into the United States exists.

"Asafetida is not sold according to test abroad, and buying brokers have to use their best judgment whenever making selections of suitable grades for export to the United States; it is evident that an error on the broker's part may put the importer, although he may have the best intentions, to a great deal of annoyance and expense."

EXPERIMENTS ON LOWER ANIMALS.

It was commanded of man long ago that "thou shalt not kill." The interpretation that was to be placed upon this commandment was that he should not kill his fellow-man. No restriction was laid upon his taking any other form of life, whether for sport, food or for purposes of experimentation, etc. We are also taught that "to everything there is a season, and a time to every purpose under the heaven," so that there is "a time to kill and a time to heal," etc. The advance of civilization has made it all the more apparent that there was a hidden truth in the words of Voltaire when he spoke of physicians as "pouring drugs, of which they know little, into bodies of which they know less." While certain classes of scientists have been at work giving us a more intimate knowledge of drugs, the experimental physiologist has given us a vast amount of information upon the various functions of the body itself. Beginning with Vesalius, the founder of human anatomy, who by means of his experiments upon living animals laid down the principles of anatomy, we observe the host following, each of whom has, by reason of his observations upon living animals, made possible the "time to heal." By means of vivisection experiments, Harvey demonstrated the circulation of the blood; Lavoisier and Priestly the principles of respiration; Schmidt and Bidder the important

facts connected with digestion and assimilation, etc. As a result of the work of physiologists on living animals, Weber laid down the principles of a rational treatment for the prevention of heart failure; Duhamel and others explained the processes by which wounds are healed, and injured parts restored, and especially how fractured bones are united; Esmarck and others have by use of ligatures inaugurated the era of bloodless surgery, etc. See what vivisection has done in abdominal surgery. In the Civil War, out of 3,717 cases of intestinal wounds, 3,273 ended fatally. Since that time experiments made upon dogs which were etherized and then shot showed the feasibility of opening the abdomen. If what we know to-day had been known then, 3,273 soldiers instead of 446 would now probably be living.

See what experiments upon living animals have accomplished in indicating to us the value of over 150 new remedies introduced during the year 1899. This means that instead of experimenting upon human kind to get this information lower animals have been used. Surely no sane man can fail to appreciate the conditions under which we live. It is man's privilege to save life and no one recognizes the privilege and duty more than the conscientious physician. He will save man, dog, canary bird and even the ubiquitous sparrow. If he can save all, he will, but he must prolong and save man's life under nearly all circumstances and all lower forms of life must be sacrificed if needs be. From the beginning it has been recognized that man was to have dominion over all and that every form of life was to contribute to his life in health and disease. In matters of food hundreds of lives of lower animals are sacrificed for sustaining the life of man, but in medicine comparatively few lives of lower animals are given to the saving of countless millions, as statistics will easily demonstrate. The matter of legislation regarding vivisection and experimentation upon the lower animals can safely be left with the scientists and professional men themselves. It is well to remember that it is the type of man like Darwin who not only hesitates to hurt a living creature, but who recognizes his responsibilities to the whole living world.

There can be no question in the mind of any enlightened person that it should be the highest duty of all to protect every living object, plant or animal, which has any claim whatsoever to our mercy and consideration. Many of the humanitarian and kindred

movements of the present time show that a kindlier and more benevolent spirit is growing in the world, and these should receive our most earnest support in all instances when they do not interfere with what may be considered the real progress of the race; and while we heartily approve of such measures as look to the amelioration of the sufferings and cruelties which those below us in the scale of existence are oftentimes forced to undergo, still we cannot overlook the vast benefit which has been rendered humanity by the large number of experiments upon the lower animals in some form or another. It would seem that humanitarian and scientific movements should co-ordinate one another, particularly when we consider that the large body of experimental physiologists and pathologists are working with the object of lessening the ravages of disease.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

PROCEEDINGS OF THE NEW HAMPSHIRE PHARMACEUTICAL ASSOCIATION AT THE TWENTY-FIFTH ANNUAL MEETING, held at Isles of Shoals, September 6-7, 1898.

The proceedings also contain the report of the Commissioners of Pharmacy.

Charles A. Tufts presented a paper on "Adulterations," in which he enumerated the chief adulterants in foods and drugs.

PROCEEDINGS OF THE TEXAS STATE PHARMACEUTICAL ASSOCIATION, held at Waco, Tex., May 16-18, 1899.

The following is the list of the titles of the papers presented: "What Legislation can be Proposed to Check the Exorbitant Charges Made in this Country by Foreign Manufacturers on the So-called Patent Chemicals as Compared with Prices Asked in other Countries," by Mr. Pfeiffer; "What Should be the Relation of Druggists with One Another in Handling Prescriptions Composed in Whole or in Part of Private Formulæ of their Own or of Physicians?" by John Pfeiffer; "Is there Any Difference in Strength or Therapeutic Value Between a Tincture Made by the Regular Method and One from Fluid Extract?" by several authors.

PROCEEDINGS OF THE MAINE PHARMACEUTICAL ASSOCIATION. Thirty-second Annual Meeting, held at Portland, July 6-7, 1899.

A number of papers were presented: "The Pressing Present Need," by W. F. Jackman; "What Standard of Knowledge of the Pharmacopœia Should be held Necessary for Registration in Pharmacy?" by Ernest Jordan; "Abstract of Special Investigations in the Laboratory of the Department of Pharmacy, University of Maine, 1899," "Notes on Some of the Questions Proposed to Competitors for Prizes in 1899," by H. T. Cummings; "The Relation of the Physician to His Co-worker," by T. J. Stevens; "The Cultivation and Collection of Opium," by E. T. Bowers; "Some Thoughts on Beginning the Study of Pharmacy."

VIRGINIA PHARMACEUTICAL ASSOCIATION. Proceedings of the Eighteenth Annual Meeting, held at Natural Bridge, July 18-20, 1899.

The proceedings contain reports of officers, but no original papers were presented.

NEW JERSEY PHARMACEUTICAL ASSOCIATION. Proceedings of the Thirty-ninth Annual Meeting, held in Atlantic City, May 24-25, 1899.

The following are the titles of the papers presented: "The Pharmacopœia and Examinations," by Wm. C. Alpers; "Poor Lime Water," by Pierce P. Bear; "Lime Water," by George E. Thum; "A History of Umbelliferous Plants," by P. E. Hommell.

BULLETIN OF THE NEW YORK BOTANICAL GARDEN. Vol. I, No. 4.

This report contains, besides reports of the officers, various botanical contributions.

BULLETIN OF MISCELLANEOUS INFORMATION. Botanical Department, Trinidad. Vol. III, Parts 8, 9, 10, 11.

These bulletins contain, as usual, a number of notes on economical plants growing in Trinidad.

BULLETIN OF MISCELLANEOUS INFORMATION. Royal Gardens, Kew. Nos. 139, 143, 147-150.

These numbers contain valuable information on economical plant subjects.

PLANTES MEDICINALES ET TOXIQUES DU DEPARTMENT DE L'HÉRAULT. Par le Dr. Louis Planchon.

A list of plants with their scientific, French and local names, together with geographical distribution, part employed and uses, which were exhibited at the exposition at Montpellier, in 1896, for the department of l'Hérault.

LA NATURALEZA. Segunda Serie. Tomo III. Guadernos Números 3 y 4.

This number of the Natural History Society of Mexico is principally devoted to a voluminous and important paper on the ornithology of Mexico, by Alfonso L. Herrera. The paper is illustrated with a large number of large colored plates of the more prominent birds of Mexico.

The following papers have been published in the Transactions of the Academy of Science of St. Louis:

NOTES ON SOME WESTERN WILLOWS. By C. R. Ball. This paper contains the results of a systematic and comparative study of over thirty species and their varieties of Western willows.

ON TEMPERATURES IN GASEOUS NEBULÆ. By Francis E. Nipher. The paper deals with the conditions in a gravitating nebula having uniform temperature throughout its mass, on the assumption that the initial temperature diminishes from the centre outwards.

THE PROCESS OF FERTILIZATION IN ASPIDIUM AND ADIANTUM. By Charles Thom. This is an important paper on plant cytology and adds to our knowledge of fertilization in those plants marking the boundary line between the lower and higher plants.

MINUTES OF THE PHARMACEUTICAL MEETING.

The regular monthly Pharmaceutical Meeting was held Tuesday, February 20th, with Mr. Richard M. Shoemaker, a member of the College and a member of the old-established drug firm of Robert Shoemaker & Co., in the chair.

The first speaker on the programme was Prof. Samuel P. Sadtler, who gave a very interesting talk on "Mineral Tannage," illustrating the same with specimens.

It may be mentioned here that Professor Sadtler has been employed for the past seven years as an expert in litigation concerning tanning processes and has in that connection patented two processes for chrome tanning.

In describing the skins which are used for making leather, he said that in ordinary usage the skins of larger animals are known as hides, whereas those of smaller animals are known as skins. He said that the animal skin, owing to the processes which have been used for removing the hair and otherwise cleansing it, is in an extremely sensitive condition when ready for tanning, and if exposed to high temperature soon spoils, or if dried in this condition it becomes like parchment.

Coming, then, to consider the subject of tanning, the speaker said that chemists differ as to whether the process involved in tanning is a chemical or a mechanical one. A number of methods have been used for converting animal skins into leather, and of the processes now in use that of tanning by the use of vegetable extracts or infusions containing tannic acid was the earliest known. In this process the tannin combines with the fibre of the skin so that it does not become parchment-like on drying. Later it was discovered that certain mineral salts have a similar effect on the skins, the processes involving this action being grouped under the head of mineral tannage or tawing. Still another process of tanning is that involving the application of oil to the skins and its subsequent oxidation.

Alum was one of the first of the mineral salts to be used for tanning purposes, but is found to be distinctly inferior to tannic acid in this respect, owing to the fact that, when the leather is put into water, the alum is washed out and the leather becomes parchment-like on drying. Later it was found that other oxides like those of iron (F_2O_3) and chromium (Cr_2O_3) had the property of combining with hide fibre. The iron salts do not appear to be very satisfactory in this respect, however, as the leather becomes hard and brittle.

For our earlier knowledge of chrome tanning we are indebted to the German chemists, Knapp and Heinzerling. The chrome tanning industry has, however, assumed the greatest proportions in this country, Philadelphia being its chief centre, and in recent years a number of patents have been taken out for various modified processes. One of the first of these was the Schultz patent process, which, though slow to be adopted by tanners, has proved of great value, and has been the occasion of much litigation extending from 1892 to the present time, owing to the number of infringements of the patent. The process, briefly stated, is (1) to treat the skins with a solution of potassium bichromate in the presence of acid, which liberates chromic acid (CrO_3); (2) then to put them into a bath of an acidified sulphite or hyposulphite for reducing the chromic acid, whereby chromic oxide (Cr_2O_3) is produced. The chrome tanning process has been found to be particularly applicable to light skins, such

as kid, goat, sheep, etc. The leather produced in this way is insoluble in water, and is superior to bark-tanned leather in the respect that it does not stretch. Its superiority to alum skin lies in the fact that it can be washed without becoming like parchment. If the tawed skins are taken before they have become perfectly dry, they may be readily given any shade of color.

The methods in use for chrome tanning are known as "one-bath" and "two-bath" processes. According to the first, the skins are subjected to the action of green chromium salts at once, and according to the latter they are impregnated with chromic acid in the first bath, and in the second treated with reducing agents. The "two-bath" process is considered to be the more valuable.

A number of two-bath processes other than the Schultz method were described by the speaker, the principal difference in these methods being due to the use of different reducing agents. The reduction is accomplished with: (1) alkaline sulphides and acid (Norris and Little); (2) hydrogen sulphide gas (Norris); (3) hydrogen dioxide or peroxides (Sadtler); (4) lactic acid (German patent by Böhringer); (5) hydrosulphurous acid (Norris); (6) nascent hydrogen, electrolytic (Sadtler).

The principal one-bath processes in use are the Martin Dennis and that known as "Eureka Tannage." In the first a solution containing chromium chloride and chromium hydrate, and sold under the name of "Tannolin," is used. The second of these processes was patented by G. W. Adler and consists in using a solution of chromium chloride or sulphate and acetate of soda.

The speaker remarked in this connection that a book was published in Germany two years ago on chrome tanning patents, which showed that three-fourths of these patents have been developed in the United States.

One of the most recent methods for coagulating the fibre of skins is that involving the use of formaldehyde. Dr. Charles S. Dolley, of Philadelphia, who has developed this method, was present, and was asked to make some remarks on it. He first referred to the use of formaldehyde for fixing animal and vegetable tissues in microscopic work, and said that its property of acting on the collagen of animal skin renders it of value in the production of leather. The advantages claimed for this leather were: that it may be put into hot or cold water without becoming hard or going back again as tawed leather. It seems to stretch very little and it was thought that perhaps formaldehyde is a better fixing agent than chromic oxide; it comes out of the formaldehyde bath almost white and is perfectly neutral to colors; owing to its suppleness it is used for valves, etc., and is thought to be more uniform in texture than chrome tanned leather. It was also stated that the method of tanning by the use of formaldehyde has the advantage of being performed in a comparatively short time. The principal drawbacks to this method are the disagreeable properties of the gas and its tendency to polymerize.

Commenting upon Dr. Dolley's remark in regard to the texture of chrome tanned leathers, Professor Sadtler said that in order to produce a uniform product the process of reduction must be thoroughly carried out and the acid afterward neutralized by an alkaline bath.

Prof. Jos. P. Remington expressed himself as being very much pleased with the remarks on the above subject, and said that it seems strange that the achievements pertaining to the chemistry of this industry should be reserved

for the nineteenth century. He wished to know how the leather prepared according to these various new processes compared in durability to that prepared with tannic acid.

Replying, Professor Sadtler said that sole leather is still made by the use of tannin, as it is desirable to have the leather built up slowly. He remarked also that 45,000,000 goat skins alone are imported into this country annually, and that when we consider the magnitude of the tanning industry, it soon becomes apparent that an economy of time and expense becomes of prime importance.

A distinction which Dr. Dolley noted was that the heavy leathers are sold by weight. The phlobaphene or coloring matter of the vegetable tanning material is taken up by the skins, so that in the leather sold by weight a certain proportion of the weight is vegetable substance.

W. E. Ridenour read a paper on "Soluble Ferric Pyrophosphate." (See page 125.)

Mr. J. W. England commended Mr. Ridenour's work very highly. He was especially interested in the reference made to possible reversion of pyrophosphate to phosphate, when the former is in solution in the presence of free acids, and thought that this factor with that of oxidation might explain, perhaps, the variability in composition of commercial scaled iron pyrophosphate, and the proneness to change of the triple elixir of iron, quinine and strychnine, made with the soluble ferric pyrophosphate. He said that many of the triple elixirs of commerce, so far as the iron constituent was concerned, were made with soluble phosphate of iron or citro-chloride of iron. Such products, he thought, did not give as good clinical results as did the elixir made with the soluble iron pyrophosphate, though they were less prone to change in composition. A perfect formula for making triple elixir from the sol. iron pyro. had not, so far as he knew, yet been devised.

A paper on "Crocus and Some of Its Adulterants," which was illustrated by specimens, paintings and drawings, was presented by William S. Weakley, assistant in the Botanical Laboratory of the College (see page 119).

A feature of the meeting was an exhibition of a variety of interesting and valuable specimens. Prof. F. G. Ryan called attention to quite a collection of specimens of crude opium, which showed how opium is put up in different countries. The collection also contained some "false" opiums and adulterants of opiums. The exhibition was made through the courtesy of Messrs. Gilpin, Langdon & Co. Professor Remington also remarked upon the special interest of the specimens and exhibited some adulterants of opium which he had procured for his cabinet.

In this connection, Mr. F. W. E. Stedem remarked upon the peculiar red color of some deodorized tincture of opium which he had made from opium which had the proper assay value.

Professor Remington said that the red poppy is very common in European countries, but that the flowers of the plant yielding official opium are white.

Prof. F. X. Moerk called attention to a collection of representative samples of the fertilizer industry, which were obtained from Baugh & Sons Co., of Philadelphia, through Mr. Geyer, one of our graduates, and which he said may be briefly mentioned in the order of their valuable constituents.

Potassium Salts: Kainite, with samples of potassium sulphate and magnesium sulphate, obtained from the same; Potassium chloride from either Sylvite

or Carnallite; these come from the celebrated deposits at Stassfurt, Germany. Another mineral from the same locality is Kieserite, having the formula $MgSO_4 \cdot H_2O$, used to make the official salt $MgSO_4 \cdot 7H_2O$.

Ammonia-yielding materials: Ammonium chloride and sulphate obtained from the ammoniacal liquors of the gas-works; sodium nitrate or Chili saltpetre.

Phosphoric acid-yielding materials: Phosphate rock from Tennessee, which is found more desirable than that from South Carolina, because of the ease with which it can be ground; bone and bone-products, bone-black or animal charcoal, bone ash or crude calcium phosphate, and a sample of asphaltum produced in the destructive distillation in which bone-black is obtained. A number of these samples are also in what is called "dissolved" form, which simply refers to the treatment with the proper quantity sulphuric acid and evaporation to pulverulent form, by which the calcium phosphate is rendered soluble in water. Lastly, a good line of fertilizers are shown, adapted to particular crops, such as wheat, potatoes, tobacco, etc.; these differ from each other by varying proportions of potash salts, soluble phosphoric acid and ammonia-yielding materials.

Mr. Shoemaker exhibited some particularly fine samples of senna pods, and in reply to some questions by Prof. Henry Kraemer said that they are replacing the senna leaves to a considerable extent and by some persons are considered to be more efficient than the leaves, and at the same time less griping in their effects. They have been used mostly by the manufacturers of proprietary remedies.

On motion, the meeting adjourned.

FLORENCE YAPLE,
Secretary pro tem.

AMERICAN PHARMACEUTICAL ASSOCIATION.

SECTION ON EDUCATION AND LEGISLATION.

The following is a list of queries submitted by the Section on Education and Legislation:

- (1) A draft of a "uniform poison law," with penalties for violation of the same.
- (2) A draft of a "pure food law," with penalties attached for adulterations.
- (3) What amount of pharmaceutical education is being given to the medical students of the present time, and how far do they profit by it?
- (4) Who is responsible for the large growth in the use by physicians of proprietary articles? How can this tendency be best controlled?
- (5) What *practical* steps can be taken by the Association towards the repeal of the present unjust trade-mark laws?
- (6) To what extent have pharmacists been benefited by pharmacy laws?
- (7) To what extent are these laws observed by pharmacists?
- (8) Some of the pharmacy laws recognize only "registered pharmacists," others have an additional class called qualified assistants; which is preferable?
- (9) Under what restrictions should pharmacists be permitted to sell liquors?
- (10) Should pharmacy boards be supported by the fines and fees accruing through the administration of the law, or by direct appropriation from the State treasury?

(11) What are the arguments, *pro* and *con*, for the admission of some of the more important of the new synthetic remedies into the U.S.P.?

(12) Give a list of those whose admission would seem desirable, and the names under which they should be admitted.

(13) A dose list is wanted for the articles official in the U.S.P., and in addition the maximum amount that can be given in twenty-four hours.

SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

At the request of F. G. Ryan, Chairman of the Special Committee on Weights and Measures, we present the following :

"The Committee on Coinage, Weights and Measures of the House of Representatives is again considering the subject of the adoption of the metric system of weights and measures as the legal system of the United States—with a view of presenting a report to Congress upon this subject. The Chairman of the Special Committee on Weights and Measures of the American Pharmaceutical Association would urge all members of the Association and all pharmacists of the United States who favor the adoption of the measure to write to the Hon. James H. Southard, Chairman of the House Committee, Washington, D. C., presenting their views upon this subject.

"Probably no class of persons would be more benefited by the adoption of this measure than the pharmacists of this country, hampered and annoyed as they now are by being compelled to use *avoirdupois* and *apothecaries'* weight, wine measure, and, in some sections, *imperial* measure, as well as the metric system.

"Since the foundation of the Republic there probably has never been a time when the importance of this subject was more apparent than it is at present. With the acquirement of new territory in distant parts of the world, and the increase of our commerce with foreign nations, a universal system of weights and measures becomes more than ever desirable. Pharmacists of the United States are to be congratulated on the advanced position they have taken in securing the adoption of the metric system exclusively, by the United States Pharmacopœia in 1890, and it is hoped that they will continue to aid in securing its adoption by Congress as the only legal system of weights and measures in the United States."

CHICAGO COLLEGE OF PHARMACY.

The Alumni Association of the Chicago College of Pharmacy held the first of its series of meetings for the discussion of pharmacopœial revision in the parlors of the Palmer House on Thursday evening, February 8th.

The meeting was called to order at 8 o'clock, President W. B. Day presiding. Notwithstanding the very stormy weather there were twenty-four members in attendance.

The first speaker was Prof. C. S. N. Hallberg, delegate to the Convention from the Chicago College of Pharmacy, and his subject, "General Observations on the Revision of the Pharmacopœia." The Professor gave an outline of the manner in which the work of revision is accomplished, and as a member of the last Revision Committee, recalled the problems that had con-

fronted the revisers in 1890. He then dwelt very briefly on the more important suggestions that had been made since the last revision, and will probably come before the Convention, and indicated some of the changes in the Pharmacopœia that are likely to be made.

Following this address, Dr. J. A. Patten, delegate to the Convention from Rush Medical College, read a paper upon "The Revision of the Pharmacopœia from a Medical Point of View." The doctor presented suggestions collated from several sources and representing the opinions of quite a large number of physicians concerning the popularizing of the Pharmacopœia among medical practitioners. Chief among these suggestions were: Simplification and condensation of the text through the reduction in the number of classes of remedies and the omission of many preparations; for example, it was suggested that there be but one solid and one liquid preparation of each vegetable drug; the inclusion of a table of doses, either in the text or the appendix; insertion of information concerning new remedies, possibly even to the extent of issuing an annual supplement bringing such information up to date; standardization of galenicals, chemically and perhaps physiologically. The author disclaimed responsibility for some of these suggestions and stated that he would not at this time commit himself as favoring them, but presented them as suggestions emanating from medical men.

In the discussion which followed it was pointed out that it was not so much the desire of the framers of the Pharmacopœia to have physicians actually possess the work as it is to bring before them, by introduction into the Pharmacopœia, and from thence through the dispensaries and works on materia medica, such drugs and pharmaceuticals as are likely to prove of value in medical practice.

The papers referred to above, being of general character, necessarily introduced many important topics, time for discussion of which could not be allowed. Several of these topics are so important that later meetings will be devoted entirely to them. One of these, "Standardization," will be the subject for discussion at the next meeting, which will be held at the same place on Wednesday evening, February 21st.

UNIVERSITIES AND ORIGINAL INVESTIGATION.—Thomas Dwight believes it is not the duty of universities to urge, much less to force, original investigations on students. It should be on hand for those whose zeal is so great that it will take no denial. He would not give more prizes, but of scholarships for deserving men we can hardly have too many. As to the encouragement and support of investigation in its faculty, it is the primary object of the professor to teach, but there are cases where it is necessary for his reputation and influence to do some original work, and the university should assist, especially in the financial needs of this. The best plan would be to place a sum in the hands of the professor at the head of each scientific department, to be spent for the good of that department, including publications. If the individual lacks discretion in the use of this fund, a check to the system would naturally follow.—*Jour. Am. Med. Assoc.*, 1900, p. 157.

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IN LANDS WHERE DRUGS GROW.

BY F. B. KILMER.

Of the several papers which I have had the honor to read before this body, the present might be considered as the third in a series of observations taken in the lands which furnish market supplies of certain drugs.

On examining a pharmaceutical map, we observe that in nearly every region of the earth, whether habitable or waste, medicinal plants are found growing. While the vision of a Hanbury, a Flückiger, or a Maisch may sweep around the entire globe, the horizon of the ordinary worker extends but a little way.

Much work has been done by very able workers upon a few of the more prominent drugs. We possess the Pharmacographia of Flückiger and Hanbury, but with reference to the production and cultivation of, and the commerce in, drugs, the authors have admitted that their information is but fragmentary and of uncertain value. In these and similar works we find statements repeated and perpetuated for a generation with no attempt at correction, verification or addition. Often we find the text-books greatly at variance with the bills of lading as to the habitat of drugs.

In commerce it often occurs that the name of a country or province is attached to a drug, not so much to indicate the source as the variety. In respect to most drugs the real field of origin is a trade secret. For example: The entire result of a recent attempt to investigate the source of a certain vegetable drug was the information that it came from South America. Taken literally this

would mean that the plant might be found alike in the tropical, the torrid, the temperate, and possibly the frigid zone; indeed, that it could be gathered anywhere from the Gulf to Van Diemen's Land. For the lack of something better we often accept the shop label as authority, and reason out that all the root found in the drawer marked "Rheum Turk" comes from Turkey; that the senna comes from Egypt, and that "Spanish Flies" come from Spain.

At best we little know the story of the life and preparation of the plants comprised in our *Materia Medica*. The methods by which our drugs are cultivated, gathered or prepared for the market are for the most part beyond our observation. The importance of such knowledge must be apparent to every worker; the lack of it lamented by all.

During the manipulation of drugs, who has not wondered at the great differences of color, size, shape, texture, and in the yield and quality of extractive matter or active principles, the wide variability in physiological and chemical characteristics, and of therapeutic properties? The revelations of the lens and the reagent may start a train of thought running out to the fields, the hills and the forest, and lead on to speculation and inquiry concerning the operations in the living laboratory, and the changes which may have taken place in the shapeless fragments before him from first to last. Of all the questions that will thus suggest themselves, the greater number remain unanswered, and many at present seem unanswerable.

Recently I made a flying visit to those parts of England where, on a commercial scale, a limited number of medicinal plants are cultivated or are gathered in a wild condition. I also visited a portion of the Continent where the harvesting of certain drugs attains the rank of an industry. It is with regret that I admit the paucity of the information collected. The most that can be claimed is that in some instances the observations made by others are herein confirmed. A few errors are pointed out; a few new facts are presented; some of the problems involved are restated.

England seemed to me to be an ideal land for drug culture. A balmy, equable climate, a varied and fertile soil, a rural population of intelligent husbandmen holding the experience and traditions of many generations. In certain localities the culture of drugs has been successfully carried on for a hundred years or more.

It may be here noted that farming, as we know it in America,

does not obtain in the British Islands. Many of the formerly great estates are now at the best only poor dairy farms. Many of the ducal owners have entered the once despised trades; as one of them tersely expressed it, "farms now are poor-paying truck." Possibly some of these gentry, now so rich in land and titles, but poor in purse, might retrieve their depleted rent rolls by giving over a portion of their acres to growing drug plants. Altogether, it seemed to me that if any one country might attain supremacy in the drug-culture industry, it should be England. At the present time there are numbers of successful growers of strictly medicinal plants in the British Islands. The names of many of them are familiar to the American trade: Ransom & Sons, Hitchin; Peter Squire & Sons, Stafford Allen & Sons, Ampthill, Bedfordshire. In addition to these, there are several cultivators of small portions of land. Other medicinal plants have become naturalized and are collected from the wild or spontaneous growths; and thus drug-growing and gathering, taken altogether, is a considerable industry in the British Isles.

A number of economic problems are involved in this industry. At the prevailing prices the drug farming by itself would bring but poor returns. The English as well as the Continental drug culturists succeed largely by reason of other industries to which plant culture is an adjunct. In England it would be impossible to secure at a reasonable price laborers enough to harvest any large crop if the labor required for a few weeks were all that could be offered. The large growers, therefore, conduct laboratories where extracts are prepared and where oils are distilled. They are thus enabled to keep their laborers employed at all seasons of the year. English growers must meet Continental competition; prices and wages on the Continent are lower than in the British Isles, to the great advantage of the Continent in cost of production. In the more thickly settled portions of the Continent, however, wages are advancing, and this industry is being crowded more and more from the old centres, and mainly toward the East and North into regions where labor is still cheap.

On the Continent wild plants are gathered by a low grade of peasant labor, including women, children and aged or decrepit people, who are content to receive the lowest wages. Some drug gatherers earn as little as 10 pfennigs ($2\frac{1}{2}$ cents) per day. While

the constant tendency to secure cheaper labor for the industry keeps the prices down, it militates against any improvement in quality.

My limited observations tended to indicate that the available supply of many crude drugs is not on the increase. In England the area given over to drug cultivation could not nearly supply home consumption if no drugs were imported into the country. Reliable figures as to the acreage under cultivation could not be obtained. On the Continent, so far as I could learn, the cultivation zone is not extensive nor is it increasing.

In rural England the struggle for existence is very keen. The large drug farmer places every obstacle in the way of his smaller neighbor. He rigidly guards his methods of culture and preparation. The smaller man cannot find out what to grow or how to make it grow; the larger man controls the market, and takes good care that the "little fellow" makes no profit. Wild medicinal plants of certain kinds seem quite plentiful in the British Islands, but buying prices are kept down to a point where there is no inducement for the laborer to gather the product.

As an example we may take henbane. The leaves of the first year's growth in the English market bring 75 cents per pound; those of the second year bring \$2.12 per pound. The supply is in the hands of a very limited number of growers. There are many small farms where the plant might be cultivated in areas ranging from a small patch to a few acres, but the small farmer lacks the requisite knowledge. Wild henbane seemed to me fairly plentiful, but in the vicinity where it is to be found labor is scarce, and there would be great difficulty for the small gatherer to find any market, except he should turn to his fortunate neighbor—the large producer—who controls both the inlet and the outlet.

Turning to the Continent, where drugs are gathered more largely from their natural habitat, we find that the annual yield of any given drug is not on the increase; good grades are always scarce; the supply is limited; and even an offer of extra price in most instances will not bring a better quality nor a much larger amount. In the evolution of "The New Germany," the regions where drugs were once gathered in quantity are now occupied by villages, factories and cultivated farms; the drug plants have been exterminated and the gatherer has "moved on."

The reasons for these conditions are various. Drug gathering is at present not like the cultivation of cotton, corn, wheat and food-stuffs, a settled industry; it is controlled by factors, small and large buyers, who seem to take good care to keep it within very narrow limits.¹ The main producer—the small peasant gatherer—is quite likely to be a very insignificant person who knows but little, whose desires are small, to whom a minute fraction of this world's goods brings content. If he or his family gather a hundredweight of drugs in a year he has only one market, and is satisfied to take whatever price may be offered him. These last observations do not altogether apply to such plants as yield essential oils, etc., or those which enter largely into other arts than medicine. Again, we may note some prominent exceptions in the case of certain very intelligent English and German producers, and of a few English chemists or German apothecaries who pursue this industry in a most painstaking manner in very remote and lonely regions.

We also see a ray of promise in the fact that in certain cities of the Continent there are being established sewage farms, on some of which medicinal-plant growing is in an experimental stage.

A visit to an English drug farm, or a stroll through the regions where the plants grow wild, is a delightful change from the smoky British city, and a wholesome relief from the pent-up shop and laboratory.

The roads, or rather the lanes, lead through woodlands, peaceful valleys, past quaint old ivy-covered stone houses, pretty commons and village greens. As we pass along peering over the hedges, white and red poppies appear; here and there a patch of lavender and mint; lactucarium almost everywhere. Under old hedges, at the stump of trees, especially in an abandoned chalk pit, belladonna grows luxurious and rank. In woods of almost impenetrable darkness, hyoscyamus, hellebore and atropa abound.

The man who will botanize on his mother's grave has been called a wretch, but drug plants seem to thrive best in the most sacred and historic spots of England. Given an abbey ruins, the remains of a Roman or other ancient fortress covered with the decay of

¹An example somewhat notable is the recent "corner" in orris root, of which the zone of possible cultivation is very large. In the face of an apparently large crop, a few factors have been able to surround the entire source of supply, to send prices skyward and shut out all comers for some years to come.

many centuries, and, among the weeds rooted in the ivy-covered wall, bittersweet and belladonna are sure to appear. Around the castle grounds of King Cynewulf the gathering of wild hyoscyamus, atropa and hellebore is quite an industry. Over the remains of Richard Baxter there is a patch of elaterium, while Tom Tiddler's ground is a field of lavender.

Many of us, for the sake of health and content, might exchange places with the drug grower. His farm buildings and houses are substantial roomy stone structures. The head of the farm is "The Master," and inside his hedges is a petty lord.

The working forces consist of heavy-built, rugged, slow-witted and plodding men; of boys who are sometimes dull and stupid, but often lively in movement, and of fairly sharp girls with cheeks that need no cosmetics, and who seem to be the most industrious and effective workers. The hours are long, beginning at daybreak, which in summer occurs at 4 o'clock, and extending to the close of twilight, which occurs in England at about 9.30 P.M. Meals and refreshments are plentiful. Early breakfast; a 10 o'clock lunch served in the field; an elaborate dinner at 1 o'clock; tea at 4 o'clock; supper at bedtime, with rations of beer at stated intervals. Wages for good men run from 12 to 16 shillings per week. Girls and boys are paid less than half rates. All hands seem very contented, good-natured, well bred, and fairly well educated.

Drug farming as there conducted is not very different from any other branch of farming. The farms which I saw were remarkably well kept and tilled; every square foot of space was utilized.

The English farmer, as a rule, shuts his fields from view by a thick hedge or by a wall of solid mason work. The drug farms are especially well barricaded. Many of the fields are far back from the main roads, and the lanes are guarded with signs of "No Thoroughfare" or "No Trespassers."

Commonly speaking, only a portion of the whole farm is given over to medicinal plants, and it seemed to me that studious care was taken to avoid any surplus crops, just enough being raised to meet the natural demands. Thus, while there might be a short supply, rarely would the market be glutted.

The scenes presented on a drug farm are of peculiar interest to one whose province it is to labor with the products there gathered. Spread before our gaze are wild fields of the palm-like leaves of

rheum; acres of the stately, beautiful but deadly aconite; shocks of poppies that look like small babies' heads tied in bunches, while among the stalks run trailing vines of elaterium looking like squashes; scores of acres of belladonna; and, as far as the eye can reach, the sweet and beautiful lavender, the whole forming a scene which appeals strongly to the esthetic sense.

The crops are cultivated and gathered in a manner which to an American seems very primitive. Hoeing is usually done by hand. The fields are kept by the boys scrupulously free from weeds, stalks and stones. Stalks and branches are cut by sickles; the reapers are followed by the girls who glean and who carry the cut stalks in their aprons to the end of the field, there to be tied up in bundles or packed in bags and loaded on carts (to which, by the way, the horses are hitched tandem).

Thus, observing in the fields the cutting of the leafy stalks, the picking by the gleaner, the heaps of leaves wilting in the carts, and, following them to the drying house, one comprehends more fully and more clearly the many changes which follow in turn from the living structure to the finished drug ready for the market.

The changes viewed in the mass are striking and impressive; seen as it were through a kaleidoscope of pharmacognostic figures. The progressive transformations most apparent to our physical senses are the changes in color, in odor and taste. Thus, we observe that, dependent upon the conditions as to handling, leaves containing chlorophyl become spotted, darken and finally turn brown or black; while flowers lose their brightness, their hues change, disappear or turn dark. Somewhat equally striking are the changes of aroma occurring in many plants. Thus, the herbaceous narcotic drugs living in the field have no distinctive odor; but the moment they are torn from the living stem and during their manipulation the odor becomes heavy, disagreeable (to the novice positively nauseating). Again, the process of drying results in giving them the comparatively tolerable mousy odor, such as we find in hyoscyamus, belladonna, etc. Freshly-dug aconite has quite an agreeable, mild, radish-like odor. On the other hand, freshly-dug orris root has a strong repulsive smell, not in the least resembling violets, as one might expect. Lavender in the field is faintly suggestive of its name, but from the moment it is cut the odor augments until it fills the whole atmosphere. The development of

odor in plants during the drying and curing process yielding aromatic principles is well known. The evolution of the odorous principles, the hydrocarburets, aldehydes and ethers in the prolific laboratory of nature has been well studied and defined.

Again, the changes of taste are somewhat akin to the changes of odor. For example: Aconite fresh from the earth might be taken for wild horseradish root; but as the drying proceeds, it becomes the acrid drug which we know and dread. The first taste of many narcotic plants when quite fresh is not unlike that of any bitter weed; by chewing, the taste peculiar to the prepared drug is developed.

To the producer the most important change is that of color; and to this change the grower and gatherer devote much energy. The methods by which certain producers secure a color of uniform brightness are rigidly-guarded secrets. Courtesy forbade my asking information on this point of those most competent to give it, and my knowledge has been gained from personal observation and experiment.

Leaves, such as hyoscyamus, belladonna, etc., are usually gathered at a time when their chlorophyl content is at its highest, and when, as known by experience, they will dry with the least possible change. This course seems to be pursued irrespective of any other consideration, for the color of the finished product governs the price.

We may conclude with Dr. Squibb that a fine green color in leaves is not always indicative of the alkaloidal value of leaves. It has been hinted that in certain instances the producer has not hesitated to dexterously use prussian blue to bring up the required tint; I saw no evidence of this practice, however.

It is agreed that plants of which the leaves are the only objectives should not be cut under hot sunshine (but since hot sunshiny days are not plentiful in England, these crops can be gathered almost any day in the year).

After cutting, the leaves are removed from the sun, and care is taken that they are not allowed to lie in large heaps, or permitted to ferment or sweat. In the making of the so-called green extract, it is claimed that the process should begin at once.

While it is undoubtedly true that plants dried in the sun do not retain their color, one gatherer stated that the sun was the

only drying agent used by him. A smaller grower stated that he plucked the leaves from the stalk, laid them flat between porous paper, after the manner of preparing botanical specimens, and allowed them to dry while so pressed. He exhibited some very fine examples said to have been prepared by this method. And again, isolated growers dry the plants by the kitchen fire, thus producing fairly good-looking drugs.

The manufacturing of the extracts of fresh plants is not within the province of this paper. We may, however, note that by this process, when well conducted, the green color of the plant and its characteristic odor are well retained. It is stated that to obtain this color it is necessary to bring the plant juice quickly to an elevated temperature, whereby the ferment principle—the cause of the change of color—is destroyed.

For drying the leaves the most common method observed was by means of what might be called drying closets. These are fitted up with trays, the bottoms of which are of wire, or in some instances cloth. These closets are usually heated by hot air, but in the larger establishments are fitted up with steam pipes; along the bottom or sides of the closet provision is made for the inlet of cold air, and for the exit of warm air at the top.

So far as I could judge it seemed the general practice in the case of plants like belladonna, hyoscyamus, digitalis, etc., to pick the leaves from the stem (from hyoscyamus the midrib is removed), then to lay them flat and rather loosely upon a tray, and place the tray in the drier. The temperature was then run quickly up to 160° – 180° (sometimes higher). As soon as the leaves were well heated through, the trays were either removed to another compartment where the temperature was lower, or else the heat was shut off, the real drying being continued at a moderate temperature, accompanied by a careful turning of the leaves as the process went on. In one drying apparatus I noticed that round baskets of cloth and wire were used instead of trays. It will be observed that the primary object in such processes is to preserve the natural color of the plant, and, of course, incidentally to prevent decay.

I became satisfied that this course is pursued in most instances without any other consideration; many of the growers, having found that a given method will produce the desired color, follow the pro-

cedure rigidly, and under no consideration could they be induced to experiment or change.

It seemed to me that to suddenly subject a fresh plant structure containing alkaloidal principles—glucosides, ether, resins, and other delicate and complex substances—to such a high temperature in the presence of so much water (comprising the natural juices) amounted to a cooking process which must result in radical if not injurious changes.

It is well known that the cause of the change of chlorophyll is due to the presence of oxydases, or oxidizing ferments which are in the cells of the fresh plant. When the plant is torn from its structure, bruised and exposed to light and air, the ferment action is started; and this is well known to be followed by destruction of chlorophyll in many plants. To avoid this the crude but effective method of heating the plant to a point destructive of the oxydase is used. If a green color is a necessity, experiments might be conducted to ascertain whether it might not be preserved by using some agent other than heat, and without injury to the other constituents. It has been suggested that the vapors of formaldehyde act as a preservative for plant colors. I am endeavoring to have experiments made with this agent on a practical scale. It is, however, quite possible that the action of the formaldehyde will bring about other and undesirable changes in the albuminoid constituents of the plant. I have also suggested experiments looking towards the drying of these plants under red or amber glass, accompanied with a moderate amount of heat.

With respect to roots the color problem is presented in a different aspect. It is not desired to preserve the natural color of roots; the general tendency of the resinous matters often present in the root is to become darker; this is not checked, and as to drugs like aconite, etc., the darker the color, the better will be the market price, as a rule.

After digging, the roots are usually washed, an operation very carelessly performed by the lower class of gatherers. The root must, therefore, be washed several times before reaching the ultimate market. To avoid the tendency of thick, fleshy roots to become mouldy, and to facilitate drying, they are split lengthwise or laterally, according to the nature of the root, or in obedience to custom. The workers in this industry have solved the problem of

drying roots in their own way. Many special processes, the product of which brings high prices, are held as secrets. Uniformity of color seems to be a general object. In certain cases this is brought about by a combined process of sweating and drying. The fresh material is covered and placed in a moderately warm place for a longer or shorter period, until the desired color is developed, and is then dried. As a rule, the more quickly the drying is accomplished, the lighter will be the color. The intelligent producer has also learned that at certain stages of growth the root or leaf is more likely to yield the desired color. Another requisite is that, at the time of gathering roots, the content of resin, starch or inulin should be at its fulness. It has been found that at such a time, the cells being well filled and the product more firm, the result will be a weight increased in proportion to bulk.

Many drugs, more especially roots, when received by the large buyer from the growing district, are unmarketable; probably they have not been well washed; or they have been carelessly dried, and, when looked at in heaps, they present a motley array of colors, sizes and shapes. It is the province of the dealer to put them into a merchantable condition. Then begins a series of washings, soakings in water, splitting, cutting and drying, a general dressing up, until the whole lot is brought to a somewhat uniform outward appearance. I am not prepared to say whether or not in such manipulation foreign substances are sometimes added.

In the course of my observations, seeing here a heap of light-colored root which ought to be dark, and there a heap of dark-colored root which ought to be light; here a mixture of muddy reds and browns that should have been bright and clear; noting in close proximity a mixture of chalks and solutions of various-colored dyes, I could imagine how easily a change of color might be brought about with the means so close at hand. How much or how little the toning processes which I have described affect the important constituents of the drugs is an unanswered problem.

Dieterich has treated the question of chemical changes which take place in the drying of many drugs in a most painstaking manner. Among the important transformations which he enumerates is the oxidation of tannic acid into phlobaphenes. This, as he shows, is strikingly illustrated in malefern and rhamnus, and also in cinchona, cinnamon, frangula, and indeed in all barks; there is also the devel-

opment of benzol, benzaldehyde, benzoic acid, and styrol in benzoin; the formation of ferulic acid in asafetida; and in all resinous drugs complex and varied reactions take place during their preparation for sale and use. The same author cites the well-known and most profitable examples of such action as exhibited in vanilla, indigo, litmus, etc., wherein the principles sought are resultants of what is termed a curing process "the work of man."

In watching the handling of drugs in the field, and in the study of their growth, a series of changes becomes quite apparent to the senses, and is easily demonstrated by experiment. As the plant is broken into parts, striking changes occur as the minutes go by; oxidation follows with incalculable rapidity; starch and inulin change to or toward sugar; the sugars in turn are transformed; the juices jellify; fats are broken up; proteids are dissolved; glucosides are resolved into sugar, aromatics and pigments.

These phenomena present important problems which have been but little studied. We know that the living plant structure is the seat of a multitude of chemical changes; that is, has been built up by successive or alternating chemical actions and reactions. As the life force departs, a series of changes begins in the plant cell that is even more complex than those of the living tissues.

Many of the changes here mentioned as observable in the plant cells during the preparation for use have been erroneously attributed to the action of the "plant acids," or obscurely explained by the use of the indefinite term "oxidation." The key to the transformations in the dead cells lies in the action of the ferments and the bacteria. When a plant is uprooted from the soil; when the stalk is severed from the root; when the branch is cut from the stalk; or the leaf is torn from the stem, there is a change of conditions and of environment that is the beginning of the end of organic existence. It dies as the animal body would die if the head were severed from the body, only more slowly, more in detail and unconsciously. The organs and functions of plant life fade away; it wilts; nutrition ceases; the secretions dry up; capillary circulation is checked; the living thing dies. Accompanying this phenomenon of death is a series of changes more rapid and more nearly akin to those which follow the departure of animal life. Micro-organisms within the plant tissue and of the air are loosed from restraint; the changes in the plant protoplasm afford a nutritive pabulum, and the

organisms grow with fearful rapidity and produce marvellous transformations. A dismembered plant left to the uncontrolled action of bacteria would soon rot and mould out of existence. But greater than all is the action of the ferments. Secreted by the plant cell, they are called into their highest state of activity by the dismemberment of the plant. The change in the juice of the dying plant furnishes the favoring media. With the inlet of oxygen they spring from a dormant state to become an incalculable force.

The presence and action of these oxidizing ferments in vegetable juices is easily demonstrated. We have simply to cut an apple, pear, carrot, and note the rapid browning of the juice. The same action will take place in many medicinal plants, probably in all containing glucosides, chromogen, and tannic compounds. In aconite, belladonna and hyoscyamus the action is observable to the eye. If the juice of these plants is extracted, boiled and filtered, the extract will have the beautiful green color of the chlorophyl which will remain. If we omit the boiling, the juice will darken, turn muddy, and the green color will finally disappear. These changes are observable even when care is taken to exclude bacteria, as by conducting the examination under cover, by filtering juices through porcelain or using antiseptics. Farther, if we add to the boiled juice a portion of the fresh unboiled extract, we find that the same change of color follows. If we extract the plant with a menstruum of glycerine and water (adding enough chloroform to prevent change), and then add to the extract an excess of alcohol, we obtain a precipitate which, on redissolving in water, will be found to be the cause of the change; in other words, the precipitate carries the oxidizing ferment.

By similar methods we may demonstrate the presence and action of diastase and inulose; the gum ferment, and the cellulose-dissolving enzymes; pectose, a jelly forming ferment; glucoside-splitting enzymes, as shown in myrosin, from mustard; rhamnase, etc. To these agents we may add the host of bacterial forces present in the plant, in the air, and invading the dead plant from every side.

My own observations, while exceedingly crude, are recorded in the hope of stimulating further study by more able workers. I have made attempts to examine and compare the extractive from certain plants while in the green state, and from the same plants dried, and

prepared under varying conditions. I have also attempted to observe and record the structural changes that may take place during the manipulations for the market by examining and comparing the cellular constituents of a specimen freshly cut from a growing plant with those of a specimen of the same plant dried under different conditions.

I can state that there are observable differences; their importance or meaning I will not attempt to interpret. Those who manipulate the same drug repeatedly know that great variations are found in different lots as regards facility of extraction, consistency of extract and other physical characteristics. Manufacturing laboratories will oftentimes make purchases only after a trial of a large sample as to "workable properties;" that is to say, the character of the extractive, the condition of the alkaloids, the ease of separation may count for as much or more than the sum of alkaloidal constituents. These workable properties at least seem to me capable of being controlled by the methods of preparation followed in the field.

The variations in vegetable drugs arising from differences of soil and climate, and of methods of cultivation, likewise certain observed facts touching specified plants, must be left for further study. I desire, however, to call attention to the recorded observations as to the differences as to physiological action between the undried and the dried plant.

NOTE.—As to the belladonna plant. I have records of cases of poisoning by the green plant, taken by competent observers at the place of growth, which clearly show marked differences of action as compared with the recorded effects of the dried plant. These differences in physiological action are possibly traceable in a measure to causes which I have here noted. Incidentally, these conditions emphasize the necessity for standardization, and at the same time reveal some of the difficulties in the way of realizing it.

My observations tend to show that at the present time we seem dependent upon haphazard sources for a large part of our supplies of crude drugs; that the commercial value, physiological action and therapeutic value of a drug may depend quite largely upon the man who removes it from the soil; that in drug culture "the man with the hoe" and the man with the sickle are quite as important as the man behind the percolator, each in a measure holding the life of the patient and the success of the physician in their hands.

So far, only in the case of plants for which a large industrial demand exists has scientific attention been given to the source of supply. Where such attention has been given, as in the case of drugs which produce essential oils and of cinchona, vanilla, indigo, etc., the advantages of intelligent systems as compared with haphazard methods in the preparation of crude material have been strikingly demonstrated. The drugs which have received little or no attention along these lines, if taken collectively, would involve a large money value. Any drug that is of sufficient importance to be engrafted into the Pharmacopœia or to be used as a life-saving agent, is worthy of study in its every aspect.

The agriculturist is more and more becoming master of the vegetable kingdom. Scientific agriculture has taught the grower how he may develop given products of plant-life forces. He can control the production of leaf, root, stalk or seed; can increase the amount or change the character of starch, sugar or other compounds; he is, in fact, master of the specific functions of his plant.

If so much can be accomplished with rye, oats, wheat, corn and potatoes, why can we not similarly treat jalap, ipecac and a hundred other drugs, and gain control of their extractives, their glucosidal and alkaloidal constituents?

It would seem to me that the extension of the study which has been so beneficial to a few of our medicinal plants would serve for the betterment of all of our vegetable materia medica.

I therefore recommend extended studies of the most useful medicinal plants, both in their natural habitats and under cultivation, having in view to ascertain the metabolic processes which enhance or decrease medicinal values;

Also studies of the changes which take place in the processes now employed in the preparation of medicinal plants for the market, especially of those containing potent, active principles, such as glucosides, alkaloids, etc.;

The publication of specific information as to the propagation, cultivation, collection and preparation of medicinal plants, with a view to the highest conservation of their medicinal constituents, and of securing more uniform production;

The publication by the Government of statistical and specific information as to the sources of leading vegetable drugs (especially such as are imported), with information as to the methods of preparation and commerce;

The issuance by the Government of bulletins of information as to the best modes of cultivating, collecting and preparing such medicinal plants as are suited to the climates of our States and colonies.

MICROSCOPIC STUDY OF URINE, SPUTUM AND BLOOD.

BY L. NAPOLEON BOSTON, M.D., Philadelphia.

Bacteriologist to the Philadelphia Hospital and to the Ayer Clinical Laboratory of the Pennsylvania Hospital; Instructor of Obstetrics in the Medico-Chirurgical College.

It shall be the object of the writer, in presenting this paper, to deal only with such methods as have, after thorough trial, proven wholly satisfactory, and to give that which is absolutely necessary for the performance of this work.

It is fairly easy to make good permanent mounts of all forms of crystals and amorphous substances, as well as bacteria and fungi found in urine; but when we desire to preserve casts, blood, pus and epithelia the work becomes more complex; yet equally satisfactory results are obtained. It is an invariable rule that better specimens can be prepared from urine after it has been allowed to stand in a cool place, while a precipitate collects at the bottom of the fluid, than where we sediment by means of the centrifuge. Decant urine and add an equal amount of water to the precipitate. Set aside in a cool place, while precipitate again forms. A portion of this sediment is lifted by means of a pipette, and a small drop is placed on the centre of a slide and gently spread by means of a fine needle. It is now viewed under a low power to determine the specimen's value. (1) It can be evaporated to dryness and mounted in Canada balsam. (2) The water may be absorbed by small pieces of filter paper, touching such portions of the urine as contain little sediment, leaving behind both organic and inorganic materials which are yet moist from the small amount of urine that remains.

In the study of fungi, epithelia, bacteria and fat, the slide is dried after the manner of (1) and heated over a flame sufficient to fix the specimen to the slide. A drop of carbol fuchsin is placed on the specimen and allowed to remain one-half minute, when it is removed by allowing a feeble current of water to flow on one end of the slide

and to flood the specimen. When all stain is removed it is well to add a weak solution of methyl blue for one-half minute and remove the stain as above. The specimen is now dried in the air, when a drop of balsam is added to its centre and a cover-glass is gently placed on this balsam, which it spreads by its weight. Where the process of drying is after the manner of (2), both organic and inorganic substances remain unchanged, and it was with a view to the preservation of all sediments found in urine that I recommended the following mounting medium:¹ Liquor acidi arsenosi (U.S.P.), 1 fluid ounce; salicylic acid, $\frac{1}{2}$ grain; glycerin, 2 fluid drachms. Warm slightly until solution is affected, when add acacia (whole tears), and again warm until solution is saturated; after subsidence, decant clear supernatant liquid. A drop of formalin (40 per cent.) may be added to this mixture if desired. By means of a glass rod a drop of this medium is placed on the centre of the specimen, when it will be seen that the remaining urine surrounds the medium, and to effect an equal distribution of the substances mounted, a fine needle is carried from the outer margin of the urine to the centre of the medium until the two show no tendency to separate. A cover-glass is moistened by the breath and allowed to fall gently upon the medium, which is spread by its own weight. Slides thus prepared should be kept in a cool place on a perfectly level surface for at least twenty-four hours, after which time they can be rung with any form of microscopic cement. No stain can be used where specimens are mounted in this medium. A peculiarity of this medium is that, on the application of heat or agitation, it becomes filled with small air bubbles. This was at first thought a possible objection, but I find specimens mounted January, 1897, containing many bubbles, show every characteristic presented by the same urine studied after the usual method employed.

The study of sputum is best conducted by pouring the sputum on a clear piece of glass and selecting for examination the small masses, if any are present. This mass is placed between two cover-glasses or slides and compressed firmly, after which the glasses are separated by a sliding movement and allowed to dry in the air. When perfectly dry, pass three times through the flame and then add a

¹ *New York Med. Journal*, November 4, 1899.

few drops of Sterling's stain¹ to the specimen and steam over a flame for from one to two minutes; remove this stain by washing in water and then add a few drops of a 30 per cent. solution of nitric acid. Continue the acid until the specimen has apparently given up all its blue color; wash in water and add saturated alcoholic solution of Bismarck brown for one-half minute. Again wash and dry between layers of filter paper. The specimen can now be mounted in Canada balsam, and when studied under the 1-12 (oil immersion) lens the tubercle bacillus is stained violet, while all other organisms and cellular elements are stained brown. My reasons for using this stain are: (1) You are never dependent upon an uncertain quantity, Gabbett's acid blue solution. (2) Bacteria, commonly met with in sputum, are better stained by Bismarck brown than by acid blue. (3) It is easier for the untrained eye to detect a violet bacillus on a brown surface than to detect the same organism stained red when surrounded by an indefinite blue. The study of pus is not dissimilar to that of sputum; however, it is well to stain several specimens, one of which should be with the view of detecting the tubercle bacillus and one by Gram's method.

The preparation of cover-glasses and slides is all-important in the study of blood. Cover-glasses on coming from the factory are usually covered with a fine film of dust, which is best removed by washing them with soap and water, taking each glass between the thumb and finger and rubbing with a soft handkerchief until it is clean, when it can be dried with another handkerchief and dropped into a perfectly clean, wide-mouthed bottle, which is carefully corked. Treating these glasses with strong mineral acids often fixes the dust to the glass and makes it troublesome, if not impossible to remove. I see no advantage in keeping clean covers or slides in a mixture of alcohol and ether.

In preparing to examine the blood of a patient, it is well to place a piece of filter paper in the bottom of a Petri dish and to remove from the bottle as many covers and slides, by means of

¹ R	Gentian violet,	10 grammes
	Anilin oil,	4 "
	Alcohol (95 per cent.),	20 "
	Aqua Dest.,	176 c.c.

Add the anilin oil to the alcohol and dissolve gentian violet in water. Add solution of gentian violet gradually, shaking between each addition; filter.

clean forceps, as are to be used; arrange them on the filter paper in such a manner that they can be lifted out readily with the forceps. The cover is now placed on the dish and it is heated moderately. Blood spreads much more readily where the cover-glasses are warm.

The lobe of the ear is washed with alcohol or ether, and after drying a slight puncture is made. The first drop of blood is wiped away with sterile gauze; the summit of the second drop is touched by the centre of a cover-glass, which is so held between the thumb and finger as not to touch its plane surface. This cover is allowed to fall gently on another in such a manner that its margin protrudes at some point, when the blood will be seen to spread between the adjacent surfaces of the covers; the projecting edges of the covers are grasped, and they are separated by pulling on the horizontal, when they are returned to the Petri dish, specimen surface up. The ear should be dried with the gauze after each specimen is taken. Where it is desired to study the blood in its fresh state for the malarial plasmodium or other parasites, the drop of blood is taken as above and the cover is allowed to spread on a slide. If it is desired that the parasite be kept living for some time, a ring of oil two-thirds the diameter of the cover-glass is made on the centre of the slide, and this ring must be broken at one or more places. The cover-glass is so placed on this ring as to bring the drop of blood in its centre, when it will be seen that the spreading of the blood will force the oil to the margin of the cover, all air having escaped through the opening in the ring which is now sealed. Blood thus prepared shows no tendency to clot, and its corpuscles are well preserved; if kept in a warm place parasites live for an indefinite time, the writer having kept the *filaria sanguinis hominis* living for ten days after this method. When studying the blood in its fresh state for malaria the first method is quite satisfactory, if the blood be collected during or near the time of a paroxysm (chill). Under a 1-12 oil immersion, the malarial parasite appears as a small hyalin body usually situated in the blood corpuscle and containing one or more granules of pigment, which are seen to be in constant vibration (Browning movement). This organism may be circular, pear-shaped or crescentic; and, in fact, there are so many varieties, that the reader is referred to "Anders' Practice of Medicine,"

pages 80 to 81, where a collection of plates of this organism is given.

Of all the methods given for the fixing of blood specimens, none other is so satisfactory as heat; as it not only fixes the specimen to the cover-glass, but favors its reaction to stains and preserves the form of the corpuscle. Fixing by heat is best accomplished in the following manner: A bar of copper $15 \times 3 \times \frac{3}{16}$ inches is placed on a tripod, and thoroughly heated by a flame which is placed under one end. The temperature of the bar is determined by dropping water on its surface, and the point at which the water boils is where we place our cover-slips, specimen down, and allow them to heat for twenty minutes. Specimens thus fixed can be studied at any future date.

Staining is best effected by the Ehrlich tricolor mixture, which is prepared as follows: Saturated watery solution of orange G., 6 c.c. Saturated watery solution acid fuchsin, 4 c.c. To these add, a few drops at a time, and shake well between each addition—saturated watery solution of methyl green, 6.6 c.c. Then add glycerin, 5 c.c. Alcohol abs., 10 c.c. Water, 15 c.c. Shake well for a few minutes and let stand for twenty-four hours; do not filter or pour stain from the bottle, as disturbing the sediment is destructive to the stain. A cover-slip is now placed in the forceps and a few drops of the above mixture is placed on the specimen, by means of a dropper, and allowed to stain for two or three minutes, when it is washed in water, dried and mounted. The advantage in using this stain is, that you can rarely overstain the specimen, and it demonstrates clearly every characteristic presented by the different cells found in both health and disease. In studying the blood for parasites, very satisfactory results are obtained by staining by 1 per cent. of eosin in 70 per cent. alcohol, for one minute. Wash in water and stain with Delafield's hæmatoxylin, one minute; or with a solution of methyl blue, one-half minute. The specimen is then dried and mounted.

Estimation of the number of red and white blood cells, hæmoglobin and differential counting form sufficient basis in themselves for a paper, and have, therefore, not been considered in this article.

COMMERCIAL CALCIUM LACTOPHOSPHATE has been shown by T. S. Barrie (*Pharm. Jour.*, 1900, p. 228) to contain 35.8 to 44.8 per cent. of free lactic acid; 12.3 to 15.1 per cent. of calcium phosphate, and 41.0 to 49.9 per cent. of calcium lactate.

EFFERVESCING CITRATE OF MAGNESIUM.

BY WILBUR L. SCOVILLE.

It is frequently reported in pharmaceutical literature that magnesium sulphate is found in solution of magnesium citrate as an adulterant, but rarely does any one call attention to the almost universal existence of magnesium sulphate in the so-called granular effervescent citrate of magnesium. Yet true citrate of magnesium is seldom obtained, at least in New England, under this title. Nearly all of the so-called granular effervescent citrate of magnesium consists of an effervescent sulphate of magnesium or of sodium. The United States Pharmacopœia has embalmed the title and kept it before the profession, but the preparation itself has been defunct for more than a decade. It is time that the corpse were buried and the thing called by its right name. So long as the Pharmacopœia holds this title, it will appear as an alias upon the label of ambiguous preparations, and variable will be its forms. The true article *can* be secured by dint of hard emphasis in an order, a willingness to delay and to remunerate accordingly, and an assertion that the purchaser knows what he wants and will insist upon having that and naught else, but in the ordinary channels of trade, and ordered in the usual manner, another article will be sent, in the writer's opinion, every time.

The objections to the official preparation are threefold: (1) it is not as nice appearing a preparation as its substitutes; (2) it costs several times as much, and (3) it is a difficult and tedious preparation to make.

As to its action, Dr. H. A. Hare says: "Citrate of magnesium is a much more irritating purge than the sulphate," but the question of therapeutics I will not attempt to consider.

Probably the greatest obstacles to its practical employment are its cost and the difficulties of making it. In its manufacture, acid citrate of magnesium is first formed by reacting upon magnesium carbonate with citric acid.

In this reaction sixteen molecules of water contained in the magnesium carbonate and the citric acid are liberated, and water must be added very cautiously, or a fluid mass will result instead of a paste. The mass is then dried and powdered. In drying, it forms a very hard and tough residue, which adheres tenaciously to the plates on which it was dried, and is difficult to powder. Greasing the plates only partially helps the sticking, and it is likely to give a

greasy appearance to the finished preparation. Since this mixture contains about two-thirds of the entire amount of citric acid in the preparation and there is an excess of only $1\frac{1}{2}$ per cent. of acid, a slight loss in removing the mass from the plates and in powdering it results in an alkaline preparation instead of an acid one. I made the effervescing salt some ten years ago four times in succession, and only the last lot was acid in reaction. The tedium of that massing, drying and powdering process is still fresh in my mind.

Finally, the sugar, bicarbonate and citric acid is to be mixed with the powdered mass, and the whole formed into a granulated salt in the usual manner.

This yields a preparation which effervesces copiously when dropped into water, but the last portions pass into solution very slowly, and the liquid remains opalescent for several hours.

Thus the increased cost of the official preparation is due not only to the added value of the magnesium carbonate, and the extra amount of citric acid required, but to the expense of forming and powdering the citrate, in itself a slow, tedious and difficult operation. Add to this the fact that the final preparation does not yield a clear and bright solution, and it is not to be wondered at that manufacturers have persistently tabooed the preparation and offered substitutes in its stead.

The substitutes offered have been mostly magnesium or sodium sulphate, combined with citric or tartaric acid, bicarbonate of soda and sugar. Some have contained Rochelle salt, and some a mixture of this with a sulphate.

In examining a number of commercial preparations several years ago, I found one which for its ingenuity was worthy of a better recognition than that allowed under a false label.

Analysis showed this preparation to have the following composition:

Magnesium citrate	2 parts.
Citric acid	18 "
Tartaric acid	24 "
Potassium bicarbonate	16 "
Sodium bicarbonate	29 "
Sugar	11 "
	<hr/>
To make	100 "

When this is dissolved in water, the reaction between the two bicarbonates and the tartaric acid produces Rochelle salt to the ex-

tent of 45 per cent. of the mixture. Thus the mixture not only gave a more copious effervescence when dissolved than any other salt, but the finished solution also contained a larger proportion of active ingredient than any other examined.

The object of including magnesium citrate seemed to be, as with some others examined, to insure a qualitative test for magnesium, if such should be tried.

Whatever may be said as to the virtues of magnesium citrate, the public has in effect declared its satisfaction with the substitutes and its unwillingness to pay the added cost in order to get the true preparation; and the medical profession seem to have acquiesced in this decision.

The British Pharmacopœia has recognized the futility of advocating an unvalued ideal, and has given an effervescing sulphate of magnesium its official recognition.

If the forthcoming U. S. Pharmacopœia will sanction an effervescing Epsom, or Rochelle or Glauber's salt, it will promote uniformity in these preparations, but to continue the present obsolete preparation is but to encourage variability and substitution.

Even the official solution of magnesium citrate is frequently found to consist mostly of sulphate, and it is probable that a large proportion of the bottles sold contain sulphate in place of citrate. The arguments in favor of recognizing this are similar to those which apply to the granular salt, but are not as strong. In my opinion, however, the effervescing sulphate solution is quite as acceptable to patients and physicians, and it would be the part of wisdom for our Pharmacopœia to sanction it. The physician or patient cares naught whether a preparation is recognized by the Pharmacopœia so long as it is satisfactory to himself.

RECENT LITERATURE RELATING TO PHARMACY.

SANTONIN ASSAY.

An elaborate critique of the several suggested methods of assay of santonin by J. Katz (*Arch. der Phar.*, 1899, 245) indicates that none are sufficiently trustworthy; hence the writer has devised a process which he claims is reliable within 1 per cent. In his process, 10 grammes santonica is extracted with ether, in a Soxhlet apparatus, for two hours and the solvent distilled off. The residue

is then cooked with 100 c.c. 5 per cent. barium hydrate solution, with upright condenser for one-quarter to one-half hour. Carbon dioxide is passed through the cooled liquid, until it is acid, when the precipitated barium carbonate is removed by filtration, the precipitate being washed twice with 20 c.c. water. The filtrate is then condensed to 20 c.c., to this 10 c.c. 12½ per cent. hydrochloric acid is added and the mixture heated on water-bath for two minutes only. It is then poured into a separatory funnel, the dish being rinsed with 20 c.c. chloroform, which is also poured into the funnel and used for extraction. This chloroform extraction is repeated twice, each time with 20 c.c., the chloroformic extract being filtered, the solvent distilled off and the residue cooked (inverted condenser!) with 50 c.c. 15 per cent. alcohol for ten minutes.

The alcoholic solution is filtered into a tared flask and allowed to stand twenty-four hours, when the mother liquid is separated from the santonin crystals, through a tared filter. The flask and filter are then washed with 15 per cent. alcohol and then dried and weighed. To the figures thus obtained must be added about 0.006 gramme santonin to each 10 c.c. alcoholic filtrate, since the substance is that soluble in 15 per cent. alcohol. The article closes with modifications of the process applied to santonin lozenges and confections, in which event the original ether extraction is unnecessary, the substance being immediately treated with barium hydrate solution.

H. V. ARNY.

A SUBSTITUTE FOR CATECHU.

The *Swiss Journal of Chemistry and Pharmacy* (1899, p. 313) reports that a dyestuff of French Cochin-China—an extract of the bark of a mangrove tree (*Brugneria gymnorrhiza*)—has been found to answer all the purposes of catechu, the yield of which is becoming insufficient for the demand. The colonial ministry of France has taken up the matter and is inaugurating the cultivation of the tree and the preparation of the extract, which is called Cay-Da.

H. V. A.

NARCOTIC EXTRACTS.

A brochure by M. Altan (abstract in *Schw. Wochsch. für Chem. und Pharm.*, 1899, 333) studies the narcotic extracts carefully and thoroughly, but shows the usual fault of continental writers—total ignorance or studied neglect of the Pharmacopœia of this country.

Thus, he urges the necessity of manufacture by percolation with appropriate menstrua, instead of maceration with alcohol; praising the Swiss and British (1898) Pharmacopœias for the innovation (method of U.S.P. 1880!). Again, he praises the two pharmacopœias above mentioned as pioneers of assay of extracts of nux vomica, opium and belladonna. His other conclusions are that dry extracts are preferable to those of pilular consistency, and the best method of assay is that of Keller (see this JOURNAL, 1893, p. 78; 1894, p. 42; 1897, p. 450), the titration being performed with iodine eosin as indicator.

H. V. A.

ESTIMATION OF GLYCYRRHIZIN.

The following assay of extract of glycyrrhiza is suggested by B. Hafner (*Ztschr. Oest. Ap. Ver.*, through *Ap. Zt.*, 1899, 558). To 10 grammes dry extract placed in Erlenmeyer flask is added 200 c.c. 95 per cent. alcohol and then 20 c.c. normal sulphuric acid; the mixture being digested with agitation for several hours. The insoluble residue is separated by filtration and is washed on filter with alcohol till filtrate is colorless. To this alcoholic filtrate is added 100 c.c. water and enough ammonia to make it alkaline. Whereupon the alcohol is evaporated on water-bath and enough water is added to bring residue to 100 c.c. From this liquid, the glycyrrhizin is precipitated by diluted sulphuric acid and the precipitate collected on filter and washed with 2 per cent. sulphuric acid until filtrate is colorless. The filter containing precipitate is transferred to a beaker and extracted with acetone two or three times, the solution being treated with excess of moist barium carbonate and the acetone evaporated. 200 c.c. hot distilled water is gradually added to the residue with stirring and the mixture is located on water-bath till excess of barium carbonate is fully settled. The solution of the barium compound of glycyrrhizin is then filtered off and the filter washed until 500 c.c. filtrate is obtained.

The glycyrrhizin in 100 c.c. of this filtrate is estimated either by weighing the dry barium compound (factor 0.8153) or by converting the barium to sulphate and weighing as such.

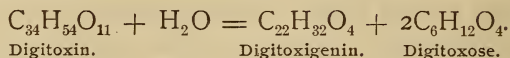
H. V. A.

DERIVATIVES OF DIGITALIS.

The classical researches of Kiliani on digitalis (this JOURNAL, 1899, p. 379) are being continued by the professor and his students.

He reports (*Arch. Pharm.*, 1899, 446, *et seq.*) that the formula of

digitoxin is $C_{34}H_{54}O_{11}$, basing same on the formulæ of its products of hydrolysis; the reaction being

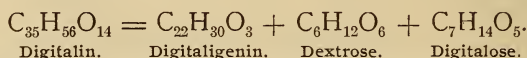


The formula ascribed to digitoxose he bases on its oxime $C_6H_{12}O_3NOH$ and its derived acid $C_6H_{13}O_4COOH$, the calcium salt and lactone of which were isolated and analyzed.

The formula of digitoxigenin given above is proven by molecular weight estimation, by the combustion of an anhydro-digitoxigenin, $C_{22}H_{30}O_3$, made by treating the substance with strong hydrochloric acid, and by a hydrated product obtained by treating digitoxigenin with sodium hydrate. This body— $C_{22}H_{33}O_5Na.H_2O$ —is the sodium salt of an acid called by the writer dixgeninic acid.

A further proof of the above formula of digitoxin is the product obtained by heating the substance with sodium hydrate in a pressure flask. This product, on being treated with calcium chloride, yielded a calcium compound— $(C_{34}H_{55}O_{12})_2Ca.3H_2O$ —the acid of which, $C_{34}H_{56}O_{12}$, he calls digitoxinic acid.

Oxidation of anhydro-digitoxigenin, with chromic acid, yielded a product, $C_{19}H_{24}O_3$ or $C_{20}H_{26}O_3$, which is termed toxigenone. Kiliani then discusses the composition of "digitalinum verum." This, he thinks, is $C_{35}H_{56}O_{14}$, basing his opinion on its dissociation products, he thinking the reaction to be:



The above formula of digitaligenin he bases on molecular weight estimations and on combustion figures. However, the data obtained from both these sources agree equally well with the formula $C_{23}H_{32}O_3$; hence it is possible that the formula of digitalin may be $C_{36}H_{58}O_{14}$.

Oxidation of digitaligenin with chromic acid yielded a product identical with toxigenone, mentioned above; thus showing genetic relationship between digitoxigenin and digitaligenin.

The digitalose formula of the above reaction is based on a lactone, $C_7H_{12}O_5$, obtained on treating the sugar with bromine. As another product of the bromine reaction was d-gluconic acid, the writer assumes that dextrose was a second product of the hydrolysis of digitalin. The lactone, $C_7H_{12}O_5$, on cooking with

calcium carbonate, yielded the calcium salt of the corresponding acid, $C_7H_{14}O_6$, which the writer calls digitalonic acid. This salt differs from its metameric salt of the digitoxose acid mentioned above, by charring without melting, at 100° .

With A. Windaus, Professor Kiliani investigated digitalëin, a product of the commercial German digitalin, the degree of purity of the product being estimated at each stage of its extraction by physiological tests on the frog. The extreme care in this concentration is especially noteworthy.

Starting with 1 kilo of the commercial digitalin, this was freed from digitonin, "digitalinum verum" and impurities by Kiliani's method of extraction and this concentration was found to effect heart systole on a frog in doses of 7 milligrammes. This product was dialyzed and the dried dialysate (yield, 40 grammes) was found fatal to the frog in doses of 3 milligrammes. This dialysate was further purified by precipitation with tannin and subsequent separation of the tannin from the precipitate with zinc oxide. This product (weight, 15 grammes) was further purified by fractional crystallization with alcohol and ether. The first fraction produced no systole, the second was not tried, but the remainder, on evaporation of the solvent (yield, 4 to 5 grammes), worked systole in doses of 0.4 milligramme. This product, digitalëin, was obtained in too small quantities to be fully examined. It was analyzed, but no definite formula could be deduced from the combustion figures. It showed glucosidal properties and its aqueous solution had acid reaction. Further investigation seemed to show that it was a lactone, becoming, by hydration in solution, an inert acid.

Both infusion and tincture of digitalis contain digitalëin; the infusion from 10 kilos leaves yielding 2 grammes of a product, 0.6 milligramme of which produced systole on the frog; while the alcoholic extract from 10 kilos yielded 150 grammes of a body producing systole in doses of 1.5 milligrammes. Further concentration of the latter body was too wasteful to be successful.

The last article in the interesting series was one on digitogenin and its constituents.

H. V. A.

THE REFRACTOMETER APPLIED TO VOLATILE OILS.

Taking as text the statement of Gildemeister and Hoffmann, in their work in volatile oils, that the refractometer has but little value

in the examination of these bodies, C. Hartwich (*Ap. Zt.*, 1899, 384) combats the assertion, showing by elaborate tables that the data thus obtained is as reliable and as distinctive as is specific gravity and polarization index.

H. V. A.

PHILADELPHIA HOSPITAL FORMULARY.

[Continued from page 133.]

LINIMENTA.

Linimentum Chloroformi Compositum.

Tr. Aconite	4 fl. dr.	15 c.c.
Tr. Arnica	1 fl. oz.	30 c.c.
Water, Ammonia (17.5 per cent.)	1 fl. oz.	30 c.c.
Lin. Chloroform, to measure	6 fl. oz.	180 c.c.

Linimentum Gaultheriæ Compositum.

Oil, Gaultheria	4 fl. dr.	15 c.c.
Alcohol	2 fl. oz.	60 c.c.
Tr. Capsicum	4 fl. dr.	15 c.c.
Liniment, Soap, to measure	6 fl. oz.	180 c.c.

Linimentum Terebinthinæ Comp.

Oil, Turpentine	1 fl. oz.	30 c.c.
Water, Ammonia	1 fl. oz.	30 c.c.
Lin. Soap, to measure	6 fl. oz.	180 c.c.

LIQUORES.

Liquor Acidi Borici.

Acid, Boric	16 gr.	1 gm.
Water, Distilled, to measure	1 fl. oz.	30 c.c.

Liquor Acidi Carbolici.

(I-40, I-20).

Liquor Antiseptica Alkalinus.

Sodium Borate	1 dr.	4 gm.
Sodium Bicarbonate	1 dr.	4 gm.
Sodium Salicyl.	4 gr.	0.25 gm.
Menthol	1 gr.	0.065 gm.
Thymol	1 gr.	0.065 gm.
Glycerin	6 fl. dr.	23 c.c.
Water, Boiling, to measure	4 fl. oz.	120 c.c.

One teaspoonful to be added to two tablespoonfuls or more of water, to be used as a wash.

Liquor Antisepticus.

An antiseptic solution containing :

Menthol, Thymol, Sodium Benzo-Borate, and the essential principles of Gaultheria and Eucalyptus, in aqueous solution, with 25 per cent. by volume of Alcohol.

EDITORIAL.

THE CULTIVATION OF MEDICINAL PLANTS.

The time is not far distant when we will be as dependent upon the agriculturist for timber and medicinal plants as we are to-day for many of the food products yielded by plants. The importance of the preservation of forest trees is becoming more and more apparent in the legislation, both State and National, which is being effected concerning it. However varied the causes which have tended to a destruction of the wooded areas in the United States, in some cases amounting to one-sixth of the total area, it must be said that the training of men fitting themselves to arrest this devastation and assist in the cultivation of useful trees is but beginning. No one can say how many useful trees will have been entirely exterminated, and no one can prophesy how long a time will be required before the work about to be started will yield profitable returns. While we have reason to believe that the more useful plants and animals, for food purposes, have been preserved, still, even this is open to question, as we know that cultivation has been an important factor tending towards the preservation of existing species in the plant and the animal kingdoms.

There is more or less mutual dependence among plants, and it is very seldom that a plant community is composed of a single species. Generally we find a number of species growing together, each contributing to the welfare of the other. Some perennials provide shade for some of the annuals; some produce mechanical supports, as in the climbing plants; some are dependent upon others for either producing soil (as in marsh plants) or enriching it (as in the plants of Leguminosæ); some are parasitic (as in the Loranthaceæ); others are saprophytic (as in the Orobanchaceæ), and still others have a symbiotic relationship, as was pointed out in a previous editorial in this JOURNAL (1900, p. 42).

The ecological relationship of plants and animals is only now beginning to be studied as a distinct branch of science. Some failures in the transplanting and cultivating of plants may be directly attributed to lack of knowledge of not only general climatic and soil conditions, but more especially of what may be their biological relationship due to environment. If there is, then, this mutual beneficial relationship between certain plants, then,

in the destruction of any one class of individuals, there is not only one class, but a number of classes, concerned. So that, in the destruction of trees or other plants (as so-called "weeds") for any purpose or lack of purpose, not only are certain plants destroyed, but those dependent upon them or in near relation to them are also affected.

The modern agriculturist recognizes this interdependence of certain plants in his "rotation of crops," but it appears that there is even a still greater application of the principle as carried out among living plants in their native haunts. The remarks of George W. Sloan, President of the American Pharmaceutical Association in 1880, are still worthy of consideration by those concerned primarily in the cultivation of medicinal plants, when he said it is "a question whether or not we are losing or at least diminishing in the production of many of our native medicinal plants, and if, in fact, the destruction of our forests will not lose to us many of the medicinal herbs and shrubs which we have grown accustomed to regard as inexhaustible, simply because they were indigenous."

These remarks are suggestive of the importance of preserving our primitive forests from another point of view, namely, that of preserving the food and medicinal plants found growing in them, or protected by them as it were, which question has not met with the consideration that it deserves.

Mr. Sloan¹ observes that around Indianapolis, "a few years ago, senega, *Hydrastis canadensis*, *Cypripedium pubescens* and several other articles were freely offered, while ginseng (*Panax quinquefolia*) was in profuse abundance, being gathered and shipped by the ton. Of these, with the exception of the latter, I have scarcely had a sample offered in nearly twenty years. The locality was heavily timbered and a dense undergrowth prevented to a great extent the pasturage of the land. After the undergrowth was cleared, even if the timber was left standing, the soil became more dry. The pasturing of the land by the various domestic animals has also contributed towards the eradication of small plants and shrubs. Another writer, from Missouri, says the principal medicinal plants that have become scarce from the clearing of the country are ginseng, senega, *serpentaria*, *spigelia*, *Arum triphyllum*, *cypripedium* and *hydrastis*.

¹ *Proc. Amer. Pharm. Assoc.*, 1880, p. 502.

Many others that were formerly abundant in Ohio, Indiana and Illinois are now very scarce there and are largely supplied from the States west of the Mississippi." It may be added that the great herb-gathering district in the United States at the present time is in the Blue Ridge districts of North and South Carolina and Tennessee. Judging from the destruction of wooded land and taking into consideration the fact that this region has offered unusual opportunities to the capitalist and others, we may expect, in the course of not many years, a repetition of the history of the destruction of drug-yielding plants in the Northern States.

If this should be the case, then it is apparent that drug farms will be a necessity and would offer peculiar inducements to those prepared to take advantage of the opportunity offered.

Many experiments have been made in the cultivation of plants and the results have been uniformly successful so far as the products produced are concerned. In the address¹ referred to is given the substance of replies from a large number of experimenters on this subject. The following are the names of some of the plants the cultivation of which has been successful in the United States, and the products have been at least equal to, and in some cases superior to, either the imported drugs or those from wild plants:

Althæa, taraxacum, calamus, catnip, motherwort, pennyroyal, peppermint, scullcap, the docks, etc.

In a recent letter from Messrs. Allaire, Woodward & Co., of Peoria, Ill., on this subject, they state that many medicinal plants are now being successfully cultivated in Michigan, such as peppermint, motherwort, boneset, tansy, sage and horehound.

Many important articles bearing on the subject of the cultivation of medicinal plants have appeared in the past ten years, and we append the following: (1) On the general subject of the cultivation of drug-yielding plants;² (2) the influence of cultivation upon medicinal plants;³ the effects of soil and cultivation on the development of the active principles of plants;⁴ the cultivation of medicinal herbs in Germany, with an enumeration of the plants successfully grown;⁵

¹ *Loc. cit.*

² *Zeitschr. Oest. Apoth. Ver.*, 1893, p. 157, p. 303; *Pharm. Post*, 1892, p. 675, p. 1021; 1893, p. 93, p. 497; *Deutsch.-Amer. Apoth. Zeit.*, 1894, p. 164.

³ *AMER. JOUR. PHARM.*, 1862, p. 268.

⁴ *AMER. JOUR. PHARM.*, 1866, p. 45.

⁵ *Chem. and Drug.*, 1893, p. 912; abstract in *Proc. A. Ph. A.*, 1894, p. 863.

the cultivation of medicinal plants in Russia;¹ the cultivation of medicinal plants in Milly;² the cultivation of medicinal plants in Lincolnshire,³ Cambridgeshire,⁴ and Banbury;⁵ the cultivation of perfume plants in Australia;⁶ cultivation of medicinal plants in Jamaica;⁷ an enumeration of the drugs gathered in Pennsylvania, together with their localities and quantities;⁸ the names of medicinal plants of commercial value that are gathered in North Carolina, with their value, and the relative amount sold in this country and exported.⁹

We are happy to present elsewhere a valuable paper by Mr. F. B. Kilmer, on the cultivation of drugs in Europe.

It is the economical side of the question of the cultivation of medicinal plants that has not been as encouraging as those who venture into new undertakings as a rule desire. While the cultivation of medicinal plants has been successful as to the quality of the product, the financial results have not been so satisfactory. Messrs. Allaire, Woodward & Co. state that in regard to the drugs cultivated in Michigan the profits are small, as all of the articles cultivated also grow wild in the South and are gathered by negroes and the poorer class of whites, who are willing to work for little money and are satisfied with but 50 cents per day. We have already alluded to the fact that the difficulty of securing cheap labor is the greatest hindrance in this country to the obtaining of financial success in the cultivation of certain useful plants, as those yielding camphor, rubber, etc. It would seem, however, that at the present time no one need expect immediate financial returns in the cultivating of medicinal plants unless the item of labor is also considered along with the other aspects of the subject. Much experimentation is,

¹ *Pharm. Jour. Trans.*, 1897, p. 58.

² *Rép. de Pharm.*, 1892, p. 375; also *Pharm. Jour. Trans.*, 1892, p. 184.

³ *Pharm. Jour. Trans.*, 1881, pp. 237-239.

⁴ *Pharm. Jour. Trans.*, 1889, p. 122; reprinted in *AMER. JOUR. PHARM.*, 1889, p. 510.

⁵ *Pharm. Jour. Trans.*, 1877, June 16; reprinted in *AMER. JOUR. PHARM.*, 1877, p. 406.

⁶ *Amer. Drug.*, 1896, pp. 327-328; 356-357; abstract in *Proc. A. Ph. A.*, 1896, p. 499.

⁷ *Chem. and Drug.*, 1889, p. 219; abstract in *Proc. A. Ph. A.*, 1890, p. 397.

⁸ *Proc. Penna. Pharm. Assoc.*, 1886, pp. 140-148.

⁹ *Proc. A. Ph. A.*, 1894, p. 210; reprinted in *AMER. JOUR. PHARM.*, 1894, p. 486.

however, necessary in working out this subject in its various phases. In the first place, quality and quantity of yield may be made commensurate with relatively high price labor. Certain classes of plants, as annuals and biennials, are more likely to yield immediate financial returns than the perennials. The same may be said of those plants that have been successfully cultivated, either on a small or large scale, over those that have not been experimented with in this direction. In the study of the flora of any particular locality it is possible to ascertain what plants are likely to be suited for experimentation; as, for instance, in localities where certain species of aconite are found it is likely that *Aconitum napellus*, L., may be successfully cultivated. It is well to remember that not every one can make a success of drug farming and that it requires men who are competent both by proper training and inclination. This matter will be considered again in later issues of this JOURNAL.

EDITORIAL NOTES AND COMMENTS.

CREDIT WHERE CREDIT IS DUE.

While a number of exchanges are accustomed to publish, either in full or in part, articles appearing in this JOURNAL, and while these for the most part observe the custom of giving credit, we note a disposition among others to entirely overlook the latter feature. While we might desire to appear magnanimous in regard to this matter, still there is a principle involved which, if lost sight of, would reflect discredit not only upon those disregarding it, but upon pharmaceutical journalism in general.

LIMITATIONS OF THE U.S.P. TESTS.

The matter of the limitations of the pharmacopœial tests is one of great moment, inasmuch as the laws of trade and commerce are being made to conform to these standards. Dr. E. R. Squibb considers that the quality of the drugs of the three large markets should be *accurately* ascertained, and the U.S.P. testing should be adjusted to the higher limits. Using asafetida (see this JOURNAL, 1900, p. 97) as an illustration, Dr. Squibb mentions the fact that the U.S.P. requires that 60 per cent. be soluble in alcohol. "The B.P. requires not less than 65 per cent. Mr. Umney thinks this too high; so high that the market cannot supply it, and has failed to supply it. Mr. E. M. Holmes shows that the market does supply it and has always supplied it to

those willing to pay the price, and that market price is *the* limitation of quality which should be guarded against on pharmacopœial authority. Otherwise quality runs down with price. Witness also aloes as another striking example of the unsafety of the market as a basis for a pharmacopœial standard. Prices ranging from 7 to 16 cents per pound with the downward screw of price still on, while good red socotrine aloes is an impossibility at less than 30 to 35 cents, and, as this should be so, this grade is very liable to be absent from the markets until the price is there to meet it, and the pharmacopœial tests are the agencies to justify the proportion between tests and prices, and both tests and prices must be high if good drugs are to be kept in the markets."

WORM-EATEN DRUGS AND THEIR ACTIVE PRINCIPLES.

The question as to whether drugs which are worm-eaten are deficient in active principles has often been asked, and the matter is deserving of extended investigation. Messrs. Schimmel & Co. call attention to the fact that the commercial oil of nutmegs "is made from the light, worm-eaten seeds, of which large quantities are rejected in sorting the different qualities in Holland. The worm most strangely robs the nutmeg of its fixed oil, whilst the essential oil remains in the seed in full." It is interesting to note that while in the nutmeg the insect has an ability to select its food from the storehouse of material as contained in the seed, yet there appear to be numerous illustrations (see editorial in this JOURNAL, 1899, p. 147) in which certain animals are wholly immune to certain plant poisons, *i. e.*, the poisons enter the digestive system but apparently do not affect the organism.

THE MICROSCOPICAL EXAMINATION OF ADULTERATED DRUGS.

The necessity for making any arguments to show either the necessity or usefulness of the microscope in the examination of drugs has been replaced by the efforts of a number of workers demonstrating its value in practice. Daniel Base, in a paper read before the Maryland Pharmaceutical Association, shows the value of the microscope in the examination of commercial specimens of ginger, capsicum, gamboge, etc. His results are as follows:

Ginger.—The four specimens assayed were examined microscopically. Nos. 1, 2 and 3 found to be pure. No. 4 was moderately

adulterated with corn starch, gathered in lumps and easily recognized by the polygonal shape and distinct star-like cleft nucleus of the grains.

Capsicum.—Samples 1 and 2 were pure. Sample 3 was adulterated with wheat flour, agglomerated in flakes, which could be seen even with the naked eye on close inspection. Sample 4 was adulterated heavily with corn starch and another kind of starch, consisting of compound granules, which were made up of small angular grains, perhaps oat starch. Judging roughly, the adulteration seemed to be 40 to 50 per cent. In spite of this fact, the color of the powder was darker than that of 1, 2 or 3.

Gamboge.—Samples 1, 2 and 4 were adulterated, apparently with dextrine made from corn starch. Many of the starch grains were well defined, and assumed a blue color with iodine. The dextrine particles were somewhat star-shaped, and were colored purple by iodine. On adding dilute caustic soda, the gamboge was quickly dissolved, leaving the starch and dextrine granules standing out prominently; these, however, were soon decolorized, swollen, and, finally, dissolved.

Sample 3 was heavily adulterated with wheat flour, which showed the characteristic rounded and oval grains of various sizes, together with cell-wall fragments.

Black Pepper.—The four samples were apparently pure.

Castile Soap.—Samples 1 and 2 contained a small quantity of corn starch and some small, rounded granules, which stained yellow with iodine, thus seeming to be proteid in nature, and, no doubt, were aleurone grains. A few cell-wall fragments were also found. Very likely the adulterant was corn meal.

Sample 3 was pure. Sample 4 contained a small quantity of corn starch and some cell fragments.

Rhubarb.—

Falap.—

Socotrine Aloes.—

} All samples seemed to be pure.

“It thus appears that adulterated drugs are found on the market, and that the pharmacist might profitably bring to bear on this subject the use of a microscope. It is also clear, from an investigation of this kind, that it is important, in these days of powdered drugs, to teach the use of the microscope to the students of colleges of pharmacy. Unfortunately, so many pharmacists, older as well as newly

graduated, are indifferent to the matter of adulterations and rely too much on the wholesaler to furnish pure articles. While many wholesalers can be relied upon, others evidently cannot, and the pharmacist ought to consider it his duty to try to discover who the unreliable ones are, not only for his own interest, but also for the interest of those who patronize him. If he buys adulterated drugs, he is a victim of a fraud, and if he sells the same drugs, he is guilty of the same fraud, although it may be unconsciously perpetrated."

COLLECTING CRUDE DRUGS.

From the inquiries received by the editor of this JOURNAL regarding the collecting of crude drugs and the possibilities of the subject, the following circular letter issued by Allaire, Woodward & Co., which we are permitted to publish, gives the important points concerning the time of gathering the drugs, the quantities necessary to be gathered for profit, and some other facts regarding the subject which will be useful to those interested in the subject:

"The business of collecting roots and herbs in most cases is not a profitable one. It is followed so largely by a class of people who would rather earn 50 cents a day in this way than three times the amount at some steady employment that it offers very little inducement as a means of earning a livelihood. In the Southern States these goods are taken in trade at the cross-road stores, examined, graded and pressed in bales suitable for shipping, and it is from this source that we obtain a large part of our supplies.

"The following directions for gathering may be useful. Flowers should be gathered when in their full bloom, or just before they begin to fade and become dark. They should be carefully dried in the shade. Leaves and herbs should be gathered at the time they are in blossom, kept free from all large stems, grass and other foreign matter. Dry in the shade to preserve the bright green color. Barks should be gathered when they peel easiest; all the outside portion or 'ross' should be shaved off before peeling. *Barks* of the *roots* of shrubs and trees need not be rossed, but should be washed clean and scraped before peeling; care should be used not to expose to dew or rain in drying. Gentle fire heat or exposure to the sun may be used in drying barks. Roots should be dug very early in the spring before plant growth begins, or late in the fall after the top has dried—*never* during the growing season; roots dug

in June and July weigh very little and are of inferior quality for medical use. They should be thoroughly washed and *dried* before shipping.

"Prices are constantly changing; golden seal, senega, ginseng, lady's-slipper, serpentaria, prickly ash berries, generally command good prices, because not very abundant, while mandrake, blood root, black cohosh, etc., though used very largely, are rarely worth more than 4 cents per pound in Peoria. Other articles are at times extremely scarce and bring high prices—prices never go up when any one has anything to sell, therefore don't try to speculate.

"Quantities—we never buy small lots of goods. We prefer to buy a year's stock of an article at one time. We save in the labor of handling, storage, etc., and unless you can procure 100 to 1,000 pounds of one article ready for shipment and think you have better facilities for supplying this article than any one else it will be useless for you to write us. We do not want to contract with parties unknown to us, for the delivery of goods at a future date. If you have anything on hand ready for shipment and wish to sell it to us, you should send a fair sample by mail, and write us stating how many pounds like sample you have to offer. If we need the goods we will name a price for them. We never buy green or undried goods—they would mould on the way and be worthless on arrival. Don't try to sell dirty goods—buyers are quite as shrewd as sellers. All receipts are carefully examined, and if not up to sample or prime in quality are rejected and held at the risk of the owner. If you send sample or ship goods, put your name on each package, so we may know whom it is from."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

VICTOR VON RICHTER'S ORGANIC CHEMISTRY OR CHEMISTRY OF THE CARBON COMPOUNDS. Edited by Prof. R. Anschütz. Authorized translation by Edgar F. Smith. Third American from the Eighth German Edition. Vol. II. Carbocyclic and Heterocyclic Series. Philadelphia: P. Blakiston's Son & Co. Price, \$3.

The English translation of Richter's organic chemistry is well known to chemists, and has merited a deserved recognition by all who are in any way concerned in chemical work. The present volume contains much of value to the pharmaceutical chemist, and

the manufacturer of chemical products. While it is terse in the consideration of the historical features of some of the more important compounds considered, yet the extended references to literature serve to make it of great value in indicating the successive steps in the progress of the science. The manner of preparation of the compounds is likewise given in a few words, which generally is sufficient to put the investigator on the track of the information he desires. The bibliographical references to this part of the subject have been carefully prepared, while the properties of the compounds discussed are fully and carefully considered. One of the most valuable features of the book is the insertion of graphic formulæ wherever possible. The portions of the book of particular interest to the pharmaceutical chemist are those treating of the alkaloids, bitter principles, glucosides, terpenes, etc. The Index has been well prepared, and has been sufficiently elaborated to make the work even more useful.

DIE ROHSTOFFE DES PFLANZENREICHS. Versuch einer technischen Rohstofflehre des Pflanzenreiches von Dr. Julius Wiesner. Zweite gänzlich umgearbeitete und erweiterte Auflage. 1 Lieferung (Bogen 1-10) mit Textfigur 1-46. Leipzig: Verlag von Wilhelm Engelmann. 1900.

The first edition of this valuable work of Professor Wiesner appeared in 1873, and has since that time been used constantly as a work of reference by botanists and those interested in the practical consideration of the various plant constituents. The book is to be revised by Professor Wiesner, with the assistance of a number of prominent botanists, chemists and others. The work is to appear in about ten parts, at 5 marks each. The first volume, and possibly the entire book, will be completed by the end of 1900. The first part has just appeared, and contains, besides an elaborate introduction, an exhaustive treatise upon the gums. The chapter on the resins has been commenced, but will be continued in Part II. The work promises to be an exceedingly valuable one. The co-operation of eleven specialists whose work is already well known is a sufficient indication of the thoroughness which will characterize the book when completed.

PRÉCES DE PHYSIQUE PHARMACEUTIQUE par le Dr. C. Sigalas. Lyon: A. Storck & Cie., Editeurs. 8 Rue de la Méditerranée 1900.

The importance of the study of physics in any of the sciences and arts is becoming more and more recognized, and any work which has for its object the study of physics primarily for the student of pharmacy and medicine is indeed welcome. The work before us is to be looked upon rather as a good book in physics, with numerous illustrations which are applicable not only in medicine and pharmacy, but to all of the arts and sciences.

MISSOURI BOTANICAL GARDEN. Eleventh Annual Report. St. Louis, Mo.: Published by the Board of Trustees. 1900.

The reports of the officers of the Board, as well as the annual report of the Director, show that the work of the Garden is progressing satisfactorily. The scientific papers published are, as usual, of a high order, and treat of various botanical subjects.

A POCKET MEDICAL DICTIONARY. By George M. Gould. Fourth Edition. Revised and enlarged. 30,000 words. Philadelphia: P. Blakiston's Son & Co.

Besides the definitions and pronunciations of more than 30,000 words, the Dictionary contains fourteen different tables for hasty reference, such as a dose table; table of tests used in medical practice; comparison of thermometers; table of weights and measures; symbols and abbreviations; the origin and distribution of the arteries; the occurrence and character of bacteria, etc. The work is conveniently arranged, of a handy size, and so well prepared that it promises to be even more popular than the previous editions.

PROGRESS IN PHARMACY AND THERAPEUTICS. Reported in "Notes on New Remedies," from September, 1898, to December, 1899, with Index. New York City: Lehn & Fink, 128 William Street.

This work of a little over 100 pages is a complete record of every advance in the domain of pharmacy and materia medica in the period under review which is likely to be of practical benefit or of scientific interest to pharmacists in the pursuit of their profession. Material of only apparent novelty and of doubtful value, as also a large number of new remedies of fantastic names and with no promise of recognition by the medical profession, has been disregarded entirely.

The work has been remarkably well done. It is furthermore so thoroughly systematized and the literature has been so well sifted that the work presents a connected review of the progress in phar-

macy and therapeutics. The disposition of the publishers to consider that pharmacy is developing into an independent science is well borne out by the facts presented. The work will be distributed free of charge to those who desire it.

MINUTES OF THE PHARMACEUTICAL MEETING.

The stated pharmaceutical meeting was held Tuesday, March 20th, with James T. Shinn in the chair.

The minutes of the preceding meeting were allowed to stand as published.

Considering the variety and importance of the subjects presented, as well as attendance, the meeting was one of the most successful of the present series.

Mr. F. B. Kilmer, of New Brunswick, N. J., was the first speaker, and made a most interesting address on the subject "In Lands where Drugs Grow," which was illustrated with lantern views (see page 155).

Those taking part in the discussion of the address were the Chairman, Prof. C. B. Lowe and Messrs. J. W. England and E. M. Boring. Replying to a question by Mr. England in regard to the cultivation of medicinal plants in the United States, Mr. Kilmer said that at the present time it could not be looked upon as a success, that is, from the point of view of an American. But, looked at from the point of view of the English or Germans, the question is somewhat different, for with them \$5,000 is almost equivalent to \$25,000 with us. He pointed out that much of the labor which is done abroad in the cultivation of drugs by hand could probably be done here with machinery. He said that many of the drugs growing in Europe can be cultivated here, and remarked, in this connection, that the question is one which colleges of pharmacy and agricultural experiment stations should take up. As to the relative therapeutic value of the green and dried drugs, Mr. Kilmer said that this was a question which had not been sufficiently investigated to enable him to answer it, although he believed there was a marked difference.

In regard to the effects of the plants on the drug gatherers, Mr. Kilmer said that the subject was rather a curious one; either those who handle the drugs become immune in a way, or else the active principles require some time to develop.

A paper by Prof. Wilbur L. Scoville, of the Massachusetts College of Pharmacy, on "Effervescing Citrate of Magnesium," was read in behalf of the author by Prof. F. G. Ryan (see page 175). In commenting on the subject of the paper, Professor Ryan said that no manufacturer would attempt to use the official process on account of its expensiveness and tediousness. He said that the process now used by manufacturers is to heat the component materials in a jacketed kettle until soft and then to use a paddle for granulating the mass.

A paper containing much useful information, and having the title "Microscopic Study of Urine, Sputum and Blood by Pharmacists," was read by Dr. L. Napoleon Boston (see page 170).

Professor Kraemer remarked that there are very few stains available which yielded uniform results in the hands of a large number of different investigators. As the result of a discussion among several plant cytologists recently,

it was shown that the same substance of different sizes and densities took up different stains. He further remarked that two other factors were equally important in securing uniform results, viz., the position of the object in the reagent and the necessarily varying strength of the solution of the reagent as well as the varying composition of most of the aniline stains. So that it was not always a lack of technique on the part of the worker which caused a variability in results, but that there must be more or less dependence upon the structures themselves, as well as the effects upon them with reagents, and he said that Virchow's principle of using as few reagents as possible and endeavoring to understand the structure of the object was the safest to follow.

Frederick T. Gordon, apothecary at the League Island Navy Yard, exhibited a simple apparatus for the estimation of urea, the estimation being based upon the amount of nitrogen evolved from a mixture of urine and chlorinated lime.

Prof. F. X. Moerk said that the apparatus was similar to that described by Dr. Squibb in 1884, the difference being that Dr. Squibb used Labarraque's solution instead of chlorinated lime for decomposing the urea.

Following the presentation of papers was an exhibition of specimens. Professor Moerk called attention to some specimens obtained through Mr. Geyer from Messrs. Baugh & Sons Co., Philadelphia, and representing products obtained from bones and skins in the manufacture of fertilizers. These included samples of glue, oils such as neat's-foot, light bone and marrow oil, and solid products, as lard stearin, tallow and bone grease.

Professor Ryan again exhibited the valuable collection of opium specimens, which was loaned for exhibition, at the previous meeting, by Messrs. Gilpin, Langdon & Co., and said that since then the collection had been presented to the College. He therefore moved that a special vote of thanks be conveyed to Messrs. Gilpin, Langdon & Co. for their gift and the motion was unanimously adopted.

On motion, the meeting adjourned.

FLORENCE YAPLE,
Secretary pro tem.

CHICAGO COLLEGE OF PHARMACY.

The second meeting of the Alumni Association of the Chicago College of Pharmacy for the discussion of pharmacopœial revision was held at the Palmer House, Wednesday evening, February 21st. The subject for discussion, for the evening, was "The Standardization of Drugs and their Preparations." The meeting was called to order by President W. B. Day and opened with an address by Dr. George F. Butler, Professor of Materia Medica and Delegate to the Convention from the College of Physicians and Surgeons. Dr. Butler treated of standardization as viewed by the physician. The necessity of uniformity and reliability of the medicines used by the physician was strongly dwelt upon, as being of the first importance; the variation in medicinal value of drugs grown or collected under varying conditions was pointed out, and the difficulties in determining just to what principles the physiological activities of some drugs are due was indicated. The speaker thought there was no difference of opinion among those engaged in medical service generally concerning the desirability of standardization, the question being as to how far standardization is practicable.

A. D. Thorburn, Ph.G., gave the pharmacist's view of the subject, stating that he fully agreed with Dr. Butler concerning the desirability of the pharmacist being able to furnish a uniformly active and reliable medicine, but thought that great care should be taken that the requirements be not too exacting. The personal equation enters so largely into analyses, especially with the apparatus within reach of the every-day pharmacist, that a certain amount of latitude should be allowed. It mattered little to the prescriber, probably, whether a fifteenth or sixteenth of a grain of the active ingredient was contained in the teaspoonful dose.

Professor W. A. Puckner, delegate to the Convention from the Chicago College of Pharmacy, spoke from the chemist's standpoint. He stated, incidentally, that while the pharmacist and perhaps the physician would care to have standardized only a few staple preparations, yet the manufacturer would doubtless be pleased to have all standardized and this from no selfish motive, but simply to insure uniformity of product. He discussed whether a drug or its preparations or both should be standardized; whether the preparation should be diluted or concentrated to bring it to a definite strength, or if stronger and weaker preparations should be mixed in proper proportions to attain this strength. Also whether a definite standard or maximum and minimum standards should be adopted, and finally he discussed methods of assay.

In the course of the discussion following the addresses, Dr. H. N. Moyer stated that he prescribed few galenicals, for he found them frequently unreliable, and that he used the alkaloids largely. He thought that many of the newer remedies should find a place in the Pharmacopœia and many of the older ones should be dropped. Mr. A. G. Vogeler urged that pharmacists should not clamor for standardization, but should wait until the physicians should demand it and then make the best of the situation. Prof. C. S. N. Hallberg said that before standardization could be made effective therapists must be able to say which of the constituents of the drug represent its medicinal value. The effect of drugs upon the lower animals might indicate the effect upon human beings, but was not so nearly identical with this effect as to serve for purposes of standardization. Nor were different individuals affected in the same way by the same drug, nor was the same individual so affected under different conditions. Messrs. T. V. Wooten, L. I. Schreiner, Bruno Batt and P. F. A. Rudnick also participated in the discussion.

The third of the series of meetings of the Alumni Association of the Chicago College of Pharmacy for the discussion of pharmacopœial revision was held at the Palmer House, Chicago, on the evening of March 7th.

The topic for discussion was "The Introduction of Protected Medicines into the Pharmacopœia." Mr. A. G. Vogeler, editor of the *Western Druggist*, presented a paper. Mr. Vogeler introduced the subject by referring to the resolution passed by the A. Ph. A. in 1889 in favor of the admission of important medicinal chemicals, even if prepared by patented processes, providing that only those of established worth be so admitted. And to a similar resolution adopted by the American Medical Association at the Columbus meeting, the sense of this resolution being that admittance to the Pharmacopœia should be granted to synthetical chemical products of definite and known chemical structure without regard to patents.

The speaker stated that the principal points that had been made against the

introduction of such medicines were these: (1) That it is unethical to use a medicine of unknown composition or the manufacture of which is controlled by a monopoly, especially as such monopoly often means an exorbitant cost to the patient. (2) Patented processes exclude the improvement in methods of manufacture of a medicine, copyrighting the name bestows perpetual monopoly, and the manufacturer may control the medicine, without regard to standard, varying its composition as he sees fit. (3) Introduction of these remedies under their trade-marked names would unduly advertise certain manufactures. These arguments the speaker then proceeded to refute. The physician is in duty bound to prescribe what his experience has led him to believe is best for the patient, regardless of ethics. Whatever the physician prescribes, unless obviously endangering the life of the patient, the pharmacist must dispense. Again, the inventor is entitled to the fruits of his labor, and protection should be extended to him. This is universally conceded concerning mechanical inventions; why does it not apply as well to the results of the chemist's researches? The Revision Committee may safely be entrusted with the duty of admitting only worthy products of this kind. He then read a large number of expressions from prominent physicians and pharmacists favoring the admission of protected remedies, the chief argument used being the advantages of having a definite standard of purity and strength of these medicines and of obtaining disinterested and authoritative information concerning them. In conclusion, the speaker stated that it seemed altogether likely that a number of the new synthetics will be recognized in the next Pharmacopœia regardless of any consideration of patents or copyrights. The pharmacist can only ask of a drug that its identity, strength and purity can be definitely fixed and controlled.

Dr. D. R. Brower, Professor of Mental Diseases, Materia Medica and Therapeutics and delegate to the Convention from Rush Medical College, opened the discussion. The doctor said that he would greatly regret the admission to the Pharmacopœia of those patented remedies which physicians are using without excuse. Such admission would be greatly to the injury of the Pharmacopœia.

Mr. A. E. Ebert asked "For whom is the Pharmacopœia created? Is it for medicine and pharmacy or for the manufacturers?" He was opposed to the admission of such remedies, especially with our present faulty trade-mark laws.

Dr. J. A. Patton expressed himself that physicians are responsible for the immense number of these patent remedies that are in use, and in his opinion the great majority of these new synthetics serve no useful purpose and could be well supplanted by official remedies. The fault rests largely with the medical colleges, most of which have, in the past, given inferior instruction in materia medica, resulting in the student neglecting this important study, and consequently after graduation depending largely upon the advertisements of the manufacturer for his remedies.

Dr. H. H. Rogers also expressed himself as opposed to the proposition.

Prof. C. S. N. Hallberg pointed out the distinctions between medicines made by patented processes, those in which the substance itself is patented and articles possessing copyrighted or trade-marked names. No preparation controlled by a copyrighted name should be placed in the Pharmacopœia, but substances the process of manufacture of which is alone patented might well be admitted. He cited the case of salicylic acid, prepared by Kolbe's

process, and thus protected at the time of its admission, as an example. The debatable ground, he said, concerned those substances which in themselves were patented, and to the admission of these he was decidedly opposed.

THE PHILADELPHIA COLLEGE OF PHARMACY.

The following is a copy of the questions given to the first and second year classes at their recent examination. Those in operative pharmacy, practical botany, pharmacognosy and analytical chemistry were conducted in the respective laboratories; the others were written.

FIRST YEAR EXAMINATION.

THEORY AND PRACTICE OF PHARMACY.

A—(1) What is a fluid extract? (2) Give the typical formula for an official fluid extract. (3) What is meant by a fluid extract made by percolation with incomplete exhaustion? (4) Describe continuous percolation and illustrate Beck's process by a sketch or detailed description.

B—(1) What is meant by vacuum percolation? What are the uses of vacuum evaporation? (3) What mechanical methods are employed in applying a vacuum to evaporation? (4) Name three examples of products used in pharmacy, or the arts, in the manufacture of which a vacuum pan is employed, and give reasons for using it in each case.

CHEMISTRY.

C—(1) Describe the element Chlorine, and write a reaction for its production. (2) What are the chief uses of Chlorine in the arts, and in what forms or preparations is it mainly taken for such utilization? (3) Give the formula for its Hydrogen Compound, and write a reaction for its production. (4) What are the compounds of Chlorine and the metals called? Give examples, naming official compounds. (5) Give the list of compounds of Chlorine and Oxygen, with names and formulas.

D—(1) Describe the occurrence of the element Carbon in nature. (2) Name the official forms of Carbon, and state the uses of each. (3) Mention the several Oxides of Carbon, and describe each. (4) What is the formula of Carbonic Acid, and how is it made? (5) Give the formula of a neutral carbonate, an acid carbonate and a basic carbonate.

PHYSIOLOGY.

E—*Digestion*.—(1) Name the digestive ferments which act upon the following, viz., bread, butter and meat. (2) State where these ferments are secreted, and the changes which take place in these foods to render them fit for absorption. *The Blood*.—(3) State briefly the route of the circulation of the blood. (4) What ratio do the beats of the heart bear to each respiration? *The Urine*.—(5) What is its normal specific gravity, reaction, quantity, color and odor? (6) Name briefly its route from the blood to the bladder. *The Nervous System*.—(7) Of what two kinds of matter is nerve tissue composed? (8) In case of contact of a finger with a hot iron, what action will take place, and why? State briefly the functions of the cerebellum and cerebrum.

BOTANY.

F—(1) What is the proper time, generally speaking, for the collection of each of the following for medicinal purposes: roots, rhizomes, leaves, flowers, fruits and seeds? State your reasons. (2) By what means may vegetable drugs be preserved from the attacks of insects? (3) What is an albumenous seed, and explain what is meant by albumen. (4) What is a composite flower? Give a drug example and indicate by means of a diagram the different parts of such a flower. (5) Explain all the steps you would take in making an examination of a powdered drug, first for identification and then for purity.

COMMITTEE.

G—(1) Describe Oxygen. (2) Give its symbol, atomic weight and valence. (3) In what form does it chiefly occur in nature? In commerce? (4) How may Oxygen be prepared? (5) What is Hydrogen Peroxide? (6) Give the percentage of Oxygen required by the U.S.P. for this compound. (7) For what purpose is it used in the arts? In medicine?

H—(1) Express in figures the following metric weights, and take their sum: Three and one-half kilogrammes, fifty-four grammes, ninety-five centigrammes, eight hundred and five milligrammes. (2) How many grammes of diluted Acetic Acid (6 per cent.) may be made from 3 kilogrammes of 80 per cent. Acetic Acid? (3) If a proprietary article selling at \$1 yields a profit of 33½ per cent., what would it cost and what percentage of profit would be secured if it were sold at a "cut rate" of 80 cents?

I—(1) What are medicated waters? (2) How are they usually prepared? (3) What is the advantage of using steam in preparing some of them? (4) For what purpose are they usually employed in preparations? (5) Name five official waters, giving official and English names.

K—(1) Write a brief account (ten or twenty lines) of the uses of Acetic Acid as a menstruum, describing its advantages and its limitations. (2) For what classes of galenical preparations is it best fitted?

OPERATIVE PHARMACY.

(1) *Specific Gravity.*

Determine the specific gravity of the liquid in the bottle labelled "specific gravity liquid;" put all calculations on the sheet of paper, with your name and examination number.

(2) *Granulated Salt.*

Ammonium Chloride 20 gm.
Purify, granulate, and put in a wide-mouth bottle.

(3) *Mass of Mercury.*

Mercury 6.6 gm.
Powd. Glycyrrhiza 1' gm.
Powd. Althæa 5' gm.
Honey of Rose 5' c.c.
Glycerin 10 drops
Put in a walnut box.

PRACTICAL BOTANY.

(1) Identify the specimens in the mixture of drugs, giving their pharmacopœial names.

(2) Identify three powders and give your opinion as to their purity.

(3) Make sections of the drug and state whether it is a root or rhizome, monocotyledon or dicotyledon, and make a diagram indicating the kinds of tissues and their cell contents.

SECOND YEAR EXAMINATION.

THEORY AND PRACTICE OF PHARMACY.

A—Mercury.—(1) Give the unabbreviated official names of five preparations of the U. S. Pharmacopœia, each containing Mercury in the metallic state. (2) Why are the words "Corrosivum," "Mite," "Flavum," "Rubrum" used in the official titles of Mercurial Salts instead of the chemical names? (3) How is Red Mercuric Iodide made? (4) Why is it necessary to use the exact quantities prescribed by the formula? (5) How is Yellow Mercurous Iodide made? (6) What was the official name of this salt in the U.S.P., 1880? (7) To what is the variation in color of this compound due?

B—Cotton.—(1) Under what title is cotton wool official? (2) How is absorbent cotton made? (3) In what respect does raw cotton differ from absorbent cotton? (4) Describe a good test for absorbent cotton. (5) What action has Sulphuric Acid mixed with water (2 to 1) upon Cellulose? (6) How is Pyroxylin made? (7) What are the uses of Pyroxylin?

C—Acacia.—(1) What is the chemical composition of Acacia? (2) What is its solubility in water? (3) In alcohol? (4) Describe the best process for making official mucilage of Acacia. (5) In dispensing, why is granulated Acacia often to be preferred to finely powdered Acacia? (6) What action have the following upon a solution of Acacia: Neutral Lead Acetate, Basic Lead Acetate, Sodium Silicate, Sodium Borate, Ferric Chloride?

D—Acid Saccharine Fruits.—(1) What acids are usually found in these fruits? (2) Describe the action of the natural ferment found in fruits upon the pulpy constituents. (3) What is pectose, and pectin? (4) Why does the rapid application of strong heat prevent the gelatinization of fruit juices? (5) Describe an effective process of preserving fruit juices without the use of chemicals.

E—Sinapisms.—(1) What two kinds of mustard seed are official? (2) Name the constituents of each. (3) Describe the action of the constituents in producing pungency in the mustard used in making "Charta Sinapis, U.S.P." (4) Give the official process for making "mustard paper." (5) Why is it necessary to protect the finished preparation from the action of moisture in the air? (6) Why is tepid water preferred to hot water in mixing a mustard plaster?

CHEMISTRY.

F—(1) Describe the occurrence of salt, and state how it is extracted from the crude native material. (2) For what important industries does salt serve as the starting point? Mention some of the products of these industries. (3) Write the formulas of Sodii Chloridum, Sodii Chloras, Sodii Bisulphis, Sodii Hyposulphis, Sodii Phosphas, Sodii Hypophosphis, Sodii Boras, and Sodii Carbonas.

G—(1) To what group of metals does Calcium belong? (2) Describe Calx Chlorata; give an account of its preparation, and state its pharmaceutical and technical uses. (3) What is the formula of Calcium Carbide? How is it formed and what is it used for? Write the reaction for its decomposition by water.

H—(1) Describe the appearance of the metal Copper, and give its physical properties. Mention its most important ores, stating their composition. (2) Mention the important alloys of Copper. (3) Enumerate the analytical tests by which Copper salts or solutions can be identified.

I—(1) Mention the most important forms of Carbon, both natural and artificial. State how the latter are produced. (2) Describe the official varieties of Carbon, and state their uses in the arts. (3) What are the chemical differences between "coal gas" and "water gas"? How is the latter made?

K—(1) Describe the metal Lead and state how it is obtained. (2) Give the formulas for the most important official salts of this metal. (3) What is "white lead," "red lead," litharge, "sugar of lead"? (4) In what other pigments, if any, is lead contained?

MATERIA MEDICA.

L—*Solanaceæ*.—(1) Give the official name, botanical origins, habitats and constituents of three mydriatic leaf drugs obtained from this order. (2) Define the term mydriatic, and state the action of such a drug. (3) Give official names and doses of the salts of three mydriatic alkaloids.

M—*Strychnine*.—(1) Give the botanical origins and habitats of the seeds yielding this alkaloid. (2) From what source is it obtained commercially? (3) Give the maximum dose. (4) State briefly its action upon the gastro-intestinal tract, the spinal cord, the circulation and the respiration.

N—*Rubiaceæ*.—(1) Name an emetic root derived from this order and the alkaloid which it contains. (2) Name a febrifuge bark yielded by this order. (3) Under what names is it official and what are the pharmacopœial requirements regarding its constituents? (4) State its habitat, the countries where it is now cultivated and the manner of collection of the cultivated barks. (5) Name the four principal alkaloids yielded by it and state the ratio of their efficiency as antiperiodics.

O—*Coca*.—(1) State the botanical origin, habitat and natural order. (2) Name the two varieties and state which is preferred. (3) What is the action of this drug and how is it used by the South American Indians? (4) Name its principal alkaloid and the amount present in the dried leaves and in the fresh leaves. (5) What action has this alkaloid upon the pupil of the eye and upon the sensory nerves? (6) What quantity is a safe dose? (7) Name the similar synthetic alkaloids that are in use.

P—*Botanical Names*.—Give the botanical names of the plants yielding the following, viz.: (1) Nicotine. (2) Quebrachamine. (3) Narcotine. (4) Eserrine. (5) Veratrine. (6) Sparteine. (7) Salicin. (8) Lupulin. (9) Digi-toxin. (10) Methyl Salicylate.

PHARMACOGNOSY.

(1) Identify fifty of the specimens in the mixture of drugs, giving their pharmacopœial names.

(2) Identify five of the powders; give your opinion as to their purity and state all your reasons.

(3) Give the names of the sediments in the specimen of urine and draw the characteristics.

ANALYTICAL CHEMISTRY.

This included the qualitative analysis of urine for abnormal constituents and the examination, for basic and acid constituents, of pure and adulterated pharmacopœial powders.

SPECIMENS FOR RECOGNITION.

(1) Aqua Fœniculi. (2) Linimentum Chloroformi. (3) Extractum Senna Fluidum. (4) Syrupus Ferri Iodidi. (5) Tinctura Gentiana Composita. (6) Ammonii Carbonas. (7) Alumen. (8) Magnesii Carbonas. (9) Ferri Sulphas. (10) Aqua Chlori. (11) Aconitum. (12) Rhamnus Purshiana. (13) Belladonna Folia. (14) Marrubium. (15) Santonica.

MINUTES OF SPECIAL MEETING.

A special meeting of the members of the Philadelphia College of Pharmacy was held at the College on Friday, March 23, 1900, at 10 o'clock A.M., to take action upon the decease of the President, Charles Bullock, who died on the evening of March 21st. Mr. Wm. J. Jenks presided.

Remarks were made by Messrs. Jenks, Shinn, Ellis, Beringer, Sadtler, Remington, England, Ross and Krewson, who expressed their high regard and appreciation of the personal character, scientific attainments, consistent devotion to the best interests of the College, the valuable research work performed in the advancement of pharmacy, the many years of persistent, unobtrusive, self-sacrificing services rendered, and their deep sense of the great loss the College has sustained in the death of its President.

Mr. Bullock graduated from this College in 1847, and served it faithfully for many years as Trustee, Secretary, Vice-President and President, and was the first President who died while holding office.

Professor Remington offered the following resolutions, which were adopted, ordered to be spread upon the minutes, and an engrossed copy presented to the family:

"WHEREAS, The inscrutable wisdom of an all-wise Providence has caused the Philadelphia College of Pharmacy to mourn the loss of its beloved President, Charles Bullock, who passed away from this life on March 21, 1900, in the fulness of years and usefulness;

"Resolved, That, while we bow in submission to this dispensation, we desire to express our deep sense of the great loss which has fallen upon us by the death of our President, who has left behind him an enduring record of labor and self-sacrifice in the discharge of his various duties, whether as student, graduate, trustee, secretary, vice-president or president. Pharmaceutical literature has been enriched by his scientific researches, and the full value of his wise and faithful service, extending over a period of fifty-three years, while

testifying to his love and zeal in laboring for the education and advancement of the younger members of our profession, can never be fully realized by the present membership of this College.

"*Resolved*, That this College will always hold in grateful remembrance the persistent labors of our deceased President, and endeavor to emulate his example; the unobtrusive, consistent, conscientious effort to fulfil all of his duties will ever be an incentive to his colleagues, who deplore most deeply his removal from our midst.

"*Resolved*, That we tender to his family our sincere sympathy in their sorrow, and that a copy of these resolutions be forwarded to them, and also be placed permanently upon the records of the Philadelphia College of Pharmacy, as a memorial of the high esteem and affectionate regard in which he was universally held by all of its members."

It was ordered that the Committee on Deceased Members, with Mr. Beringer added to it, prepare a memorial for publication in the AMERICAN JOURNAL OF PHARMACY.

It was also ordered that the engrossed resolutions be signed by the officers of the Board of Trustees, as well as by the officers of the College.

On motion, the meeting adjourned.

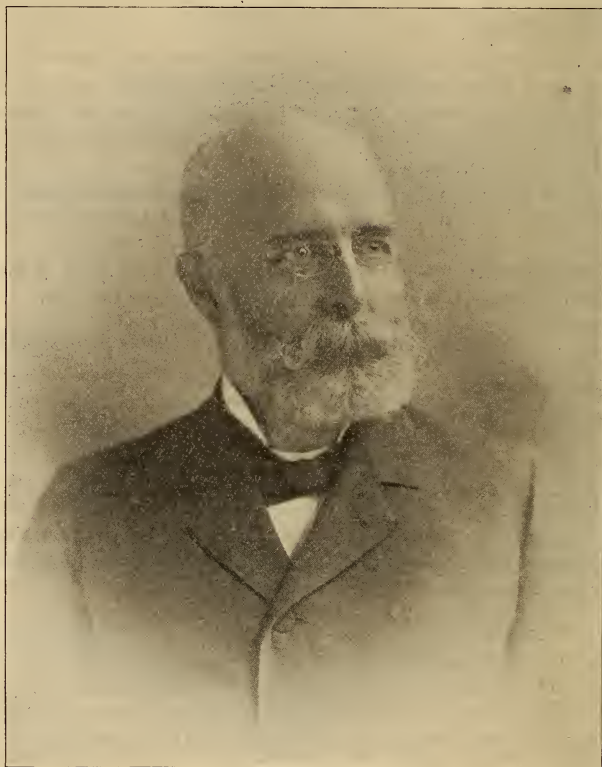
W. NELSON STEM,
Secretary.

VARIETIES.

THE MICHIGAN UNIVERSITY SCHOOL OF PHARMACY is about to adopt a new plan for the benefit of its classes in pharmacognosy. Several acres of ground have been secured for the purpose of growing all medicinal plants necessary for class or research work.

SCHOOL OF PHARMACY, UNIVERSITY OF KANSAS.—One of the most important matters in connection with the history of this school is that which relates to the act of the legislature of 1899, which appropriated \$55,000 for the erection of a new building suitable for the purposes of chemistry and pharmacy. This new building has been located on "Mount Oread," the location of the University buildings, and within a stone's-throw of the natural history building. The foundation rests upon solid rock. The money which has been used for the structure has been put mainly into walls, and such equipment as will furnish each room, wherever desired, water, gas, compressed air, exhausts, high-pressure steam, and all of the appliances for the latest equipment of such buildings. The equipment of the rooms with lecture tables, etc., is an added expense which is to be provided for outside the \$55,000. The new quarters will furnish to the pharmacy school an important addition to what it now has, namely, a room especially devoted to the art of dispensing, where every student will be required to take up this subject in a practical way under proper instruction. A special laboratory for pharmacognosy, in connection with a museum for the display of crude drugs, will be another feature of the new building. In this room, it is to be hoped, there will be some inspiration for original work by advanced students.

HOWARD B. FRENCH, Second Vice-President of the Philadelphia College of Pharmacy, was unanimously chosen President of the College at the annual meeting held March 26, 1900. He succeeds the late Mr. Charles Bullock, who had been President of the College since 1885.



HOWARD BARCLAY FRENCH.

Mr. French was born in Salem, O., September 3, 1848, and when but four years of age, his parents removed to Philadelphia. His early education was received in the school of the Society of Friends. He learned the drug business while apprenticed to the late William B. Webb, a prominent pharmacist of this city, and who was for many years a Treasurer of this College. Mr. French graduated from the Philadelphia College of Pharmacy in 1871, and soon thereafter became a member. He has been for many years active as Chairman of the Property Committee of the College, and in this capacity superintended the erection of the new building. In 1897 he was elected Second Vice-President by reason of the death of Mr. Robert Shoemaker.

THE AMERICAN
JOURNAL OF PHARMACY

MAY, 1900.

SUGGESTIONS FOR REVISING THE SEVENTH DECEN-
NIAL UNITED STATES PHARMACOPŒIA.

BY LYMAN F. KEBLER, PH.C., M.S.

The date for the convention to consider the principles to be observed in revising the present Pharmacopœia is rapidly approaching, and hints from the various workers throughout this country will, undoubtedly, be duly appreciated by the Committee of Revision. It has been the writer's good fortune to study our legal pharmaceutical and medical standard and guide from various points of view, and some of the conclusions arrived at he now desires to present.

Permit the writer to say, by way of introduction, that, if some of the language should appear to be dressed in the garb of criticism, it is not the sole function of criticism to find fault; but its chiefest and sublimest part is to observe those essentials which should appeal to the reasonable thinker. The latter is the spirit of these few comments and suggestions.

The 1890 Pharmacopœia is conspicuously a monumental record of American progressiveness. Its standards are of exceptional value. The more we study its contents, the more are we impressed with the fund of knowledge possessed by the various workers who assisted in its compilation. Some of them placed their standards so high for some chemicals that the ideal rather than the real seemed to have been in mind; consequently, the requirements are frequently those of C.P. articles, in the strict sense of the word, and some of the best manufacturers in the country have literally refused to make some of the U.S.P. products, so as to comply with that standard at current prices.

Then, again, the Pharmacopœia contains a number of analytical methods which are either impracticable of application, or, if applied, lead to erroneous conclusions. In the writer's opinion, it is far better not to give any directions than to give a method which requires time and money for execution and yet yields results that are worse than useless.

As an example, the writer desires to call attention to the directions for estimating the moisture in wool-fat. "When heated on a water-bath, it finally leaves a residue amounting to not less than 70 per cent." If these directions are followed, the oily portion and the water separate, when the temperature of the bath is raised sufficiently to melt the fatty product, and the water sinks to the bottom, while the fat floats on top. This separation into layers effectually prevents the vaporizing of the aqueous portion at the temperature of the water-bath. Even at 115° C. the fatty layer retards the vaporization of the water very materially. The writer would not venture to report on the results obtained at the latter temperature unless heated a very long time.

The proper way to estimate the moisture in this product is to place a given weight of the article into a tared evaporating dish, containing clean, dry sand or powdered glass, and a small glass stirring rod; warm on the water-bath, intimately mix, and occasionally stir while evaporating on the water-bath. Finally place in an air-bath and dry to constant weight at 100° C. The amount of moisture can now be easily ascertained if the proper weights are at hand.

Let us now consider the position of some chemicals. Suppose, for example, one of our States allows the use of sodium benzoate as a preservative of jellies, mince-meats, fruits, etc., but requires the chemical to be of U.S.P. quality. One manufacturer claims that his article is U.S.P. because he employs U.S.P. goods from which to make it. Another maker says he cannot manufacture a U.S.P. article at the present commercial price. Yet, both use the same U.S.P. goods to make their sodium benzoate.

The reader perhaps wonders where the difference comes in. It is this: one judges his goods by the spirit of the Pharmacopœia, the other by the letter of the text. The requirements of both sodium carbonate and the bicarbonate allow a limit of chloride; and of course it is expected (the spirit) to employ one of these to

make the benzoate from; but according to the tests for this compound the presence of a chloride is rigidly excluded. Some one says, and rightly, "Such a small amount of chloride is perfectly harmless." But according to the letter of the text it is not U.S.P., and a hair-splitting commission might make it unpleasant for some one.

Then again, potassium citrate is 100 per cent. pure, chlorides and sulphates being rigidly excluded; yet citric acid is allowed to have a limit of sulphuric acid and metallic impurities, and potassium carbonate and bicarbonate are both allowed to contain a limit of chloride.

This state of affairs requires circumspection and investigation, in view of some of the present existing State laws, which designate the Pharmacopœia as standard for all officinal preparations.

It would seem eminently desirable to adopt the Pharmacopœia as a legal standard or guide, otherwise there would probably be as many standards for medicinal remedies and commercial goods as there are commissions. The limitations ought not, however, to be so exacting, excepting where absolutely fresh material is necessary, as to be applicable to a preparation only once, and that when freshly prepared. Impossibilities should not be requested. The standard ought to allow a reasonable degree of variation for products that are prone to change under the most favorable environments. To bring this home forcibly it is only necessary to mention such preparations as spirit of ammonia, bleaching powder, tincture of iodine, spirit of nitrous ether, etc. Another thing, however, must be considered in this connection, and that is, if the Pharmacopœia is adopted as a legal standard for various articles, the wilful adulterator will carefully study this standard and so adjust his adulterations that the article adulterated will comply with the legal standard, and yet be adulterated.

For example, wood alcohol (methyl alcohol) is at present so highly refined that it can readily be employed as an adulterant of grain alcohol (ethyl alcohol) without much liability of being detected by the present pharmacopœial tests. Some of the essential and fixed oils can readily be manipulated and yet comply with the U.S.P. standards. Oil of copaiba is met with mixed with oil of gurjun balsam, and oil of peppermint containing 25 per cent. of oil of turpentine finds its way into the channels of trade; but the

U.S.P. tests are not adequate to reveal the adulterations. The official oils of eucalyptus are substituted by or adulterated with some of the many eucalyptus oils derived from the many species of eucalyptus. The olive oil—cotton-seed oil tests are far from satisfactory, and cod liver oil may contain a considerable amount of other fish oils without much fear of positive detection.

It also frequently happens that a test or method or standard of to-day is rendered perfectly useless by the investigations of to-morrow. For these reasons it appears to the writer that it is undesirable to adopt the Pharmacopœia as a hard-and-fast standard, but rather let the Pharmacopœia be the guide, supplemented by all other available standard literature.

The general principles adopted by the National Convention of 1890, to be followed in revising the Pharmacopœia, were excellent in character and spirit. Let us quote just one. "In the case of chemicals the degree of purity or the allowable percentage of impurity shall be prescribed as closely as practicable. The standard of purity shall be set as high as practicable for legal enforcement, but not beyond a point reasonably attainable by the manufacturer without subjecting any particular product to unnecessary cost, through the enforced removal of some harmless and insignificant accidental impurity."

The above is certainly comprehensive and liberal enough not only for the manufacturer, but for the consumer also. The spirit of this resolution has apparently not been fully kept in mind when adjusting the standard of some chemicals.

The following is what a foreign manufacturer writes when he was notified concerning the rejection of some of his goods:

"With regard to the sodium hypophosphite, we know that it is alkaline in reaction, so is T. & K.'s—and the reason it is so is because both the sodium and potassium are made with calcium hypophosphite, by precipitation, with the respective alkaline carbonates, and the balance of decomposition is so near that it will either contain calcium or be alkaline. And we find that being slightly alkaline prevents the insolubility and want of turbidity which would be seen if the calcium were present. With regard to the sulphates and chlorides, we again say that the quantities are but mere traces and do not affect the medicinal use of the article. If people want hypophosphites and half the other things to stand the

tests of the Pharmacopœia they will have to pay a guinea an ounce for some of them."

These remarks are directly in accord with the resolution quoted above, and no one can justly say that they savor of commercial gain. In this age of reasonable goods there are but few, if any, who are willing or can afford to pay for the heavy expense necessary to remove traces of chlorides or sulphates from medicinal agents which would not be enhanced therapeutically, or for commercial purposes, *one iota*, as the result. The manufacturer is willing, if he can get the right prices, to supply anything asked for.

In prescribing standards for the U.S.P. the writer is of the opinion that the following three propositions should be rigidly kept in mind:

(1) The standard of all U.S.P. preparations, drugs and chemicals should be so adjusted that they are not only satisfactory medically, but that they can also be manufactured from other U.S.P. goods, which enter into their preparation either in part or as a whole.

(2) The requirements of all U.S.P. goods should be such that they can be employed in the manufacture of all other U.S.P. goods, of which they form an integral part, either in part or as a whole.

(3) The best medicinal goods available in commerce should form the basis of all standards.

The present Pharmacopœia is frequently at variance with the above propositions. Suffice it to say that when standards are so exacting that not a single manufacturer's goods will comply with them, these standards must of necessity become dead letters and of non-effect. As the result, each analyst must take a responsibility upon himself that belongs elsewhere, namely, the establishment of a fair and just standard.

This introduces us to a very important subject, namely, the determination of the constants of the various substances, the degree of purity, limit of impurities, etc. In this matter the Pharmacopœia should give such information that the results obtained by the various workers in various parts of the country would be fairly concordant and easily arrived at.

On looking over the constants of the Pharmacopœia the careful observer will soon ask: "Are the various boiling-point and melting-point temperatures used in this book corrected or uncorrected?"

This is important. The difference between the corrected and the uncorrected temperatures amounts to considerable, especially at high temperatures, and should be taken into account.

In determining such common constants as specific gravities, melting-points or boiling-points, etc., it is surprising what varying results are frequently reported. This, of course, is due to the different methods employed. It would be an easy matter to state that the melting-point of acetanilid should be taken by means of a capillary tube, giving rate of rise of temperature per unit of time, or to say that the melting-point of beeswax is to be taken by Pohl's method, describing it.

Again, there would be much satisfaction when turning to spermaceti to find that its specific gravity is so, or so, taken at the boiling-point of water compared with water at 15° C., or to find that the specific gravity of beeswax is to be determined by the "suspensory method."

Another point in this connection ought to be carefully considered and that is, whether or not it would not be of considerable convenience to give the specific gravities of fluids at not only 15° C., but 25° C. also. The writer has frequently experienced much difficulty in adjusting the temperature to 15° C. during warm weather. And after it is adjusted there is much danger of the atmospheric moisture condensing on the cool external surface of the picnometer and thus vitiating the results. It is practically impossible to keep the atmosphere within the balance sufficiently dry to obviate this difficulty.

The writer does not wish to find fault with anything in the *Pharmacopœia* of a progressive nature, but it does seem that it is far more important to include in the next *Pharmacopœia* concise methods for determining the melting-points, specific gravities, etc., of certain substances, than to devote so much space to volumetric work. There is only one way of making up a volumetric solution, and if it is necessary to sacrifice something to economize space, omit that, concerning which there is absolutely no question about its uniformity.

But is it necessary to give up some of the volumetric directions? The writer does not think so. On looking over the *Pharmacopœia* we frequently find repeated expressions like the following: "The solution (5 per cent.) should not effervesce on the addition of an

acid (absence of carbonate).” “Another portion of the filtrate should remain clear on the addition of a few drops of silver nitrate T.S. (absence of chlorides).” “The aqueous solution (2 per cent.) acidulated with nitric acid should not afford more than a slight opalescence with barium chloride T.S. (limit of sulphate).” And similar ones are found for testing for the presence or absence of other substances of the same character.

Now, there is only one test for carbonates or chlorides or sulphates under normal conditions. Why, then, make these useless repetitions again and again on the pages of the Pharmacopœia? Why not collect such instructions in the latter part of the book, as has been done in the last edition of the British Pharmacopœia, and give them once for all? Whenever a case is met with where special directions are necessary to arrive at the proper conclusions, then and there, and there only, give them.

Some one says the object of the committee was to make each set of tests complete in itself, therefore these many repetitions. If there were a large number of volumes, such a reason would be very good, but hardly for one volume. It is easy to turn to the tests in their proper places if the Pharmacopœia is known to the worker at all.

Remarks, comments and suggestions similar to those contained in the foregoing pages could be greatly multiplied, but it would appear that sufficient has been said to properly present the actual condition of affairs. It is a very easy thing to have or frame high ideals, and it is eminently desirable to strive for them, but, inasmuch as it is impracticable to attain them at present, in many cases, it would be far better to establish such standards as the progress of chemistry, pharmacy and botany warrants and therapeutics needs.

The Committee of Revision should keep in mind the object of the Pharmacopœia, and not simply because this or that commission has extended or refined certain tests strive to outdo some one else in the matter of raising certain standards. It should also remember that whether the standards set are high or low there are always those who are ever ready to pronounce the latest revision decidedly superior to and better than all previous editions.

A FEW REMARKS ON, AND WORKING FORMULAS FOR, THE OFFICIAL AND OTHER PREPARATIONS OF SOAP.

BY M. I. WILBERT, PH.G.,
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Few preparations have been more liberally discussed, and few give the working pharmacist more annoyance than do the official preparations of soap. We need offer no apology, therefore, for adding this contribution to the numerous and varied ideas and opinions that have been published.

Sapo Mollis: Those of us who have had occasion to make this preparation according to the directions of the *Pharmacopœia* will readily recall the trouble that it occasions, the time that is required, and the amount of stirring that is necessary before the mixture of alkali, water and oil begins to saponify.

In hospital practice, and especially in a hospital doing much surgical work, this preparation is used very extensively. Having occasion to supply relatively large quantities of green soap, to be used for various purposes, we soon discovered that the official formula required more than a reasonable amount of time and attention. Time, especially when it must be devoted exclusively to any one thing, is rather too valuable; and it was with the idea of trying to overcome this necessary close application that we began experimenting so as to, if possible, simplify the necessary technique.

If we stop to consider what we desire to accomplish, by the application of heat and the constant stirring of the mixture of alkali, oil and water, we will readily see that it is the more or less intimate mixing of the oil with the aqueous solution of the alkali, so as to allow the latter to act on the former under the most favorable conditions.

To reproduce this, or approximate an equally favorable condition, we finally decided on the following formula and method of procedure:

Green soap	250
Linseed oil	2,000
Potassa (90 per cent.)	450
Alcohol	200
Distilled water	2,250

To the alcohol, in a good-sized vessel, add the green soap and allow to dissolve, then add 1,250 c.c. of water and dissolve the alkali

in this mixture ; now gradually add the oil, stirring constantly, the idea being to make an emulsion by means of the added green soap. After the oil has been added, allow the mixture to stand for some time, so that the strong alkali solution may react with some of the oil. After standing an hour or two, gradually add the remaining portion of water, constantly stirring to avoid breaking the emulsion. After all the water has been added, it will be necessary to stir the mixture occasionally, to prevent its separating; in the course of another hour or two the mixture will be stiff enough to stand without further attention. It will take from twelve to twenty-four hours before the oil is perfectly saponified, depending largely on the care exercised in making the emulsion and also on the temperature of the room. The actual time necessary to look after the making of this preparation need not exceed fifteen or twenty minutes; no heat is required, consequently there is no danger from fire. The risk involved in bringing a pot of linseed oil to a boil over an open fire is readily recognized and admitted, and for this one reason alone it would be advisable to dispense with the boiling process, if possible. Add to this the saving of time and the practical impossibility of spoiling a batch by carelessness, it will readily appeal to all that this process has much to recommend it to the working pharmacist.

Liquid Antiseptic Soap: Partly with the idea of preventing unnecessary waste of green soap and partly to offer the surgeon something more efficient and at the same time more convenient and better adapted for preparing the field of operation, as well as the hands of the operator and his assistants, the following formula was devised :

Green soap	1,500
Alcohol	700
Water	50
Cresylic acid	100
Carbolic acid	50

It will be noted that this is practically the *Linimentum Saponis Mollis* of the Pharmacopœia, with the addition of cresylic and carbolic acids, and the omission of the oil of lavender. This mixture has been in use for more than two years, and has found much favor not only with the surgeons, but also with others, and especially with the pathologists, who are constantly exposed to the most virulent

infections, to say nothing of the disagreeable, persistent and clinging odors that accompany the performance of much of their work. This preparation has been found particularly efficient as a detergent and as a deodorant in counteracting the persistent and penetrating odor of carcinomatous tissues.

It is advisable to dispense this preparation in glass-stoppered vials with the caution to have the hands well wetted before applying the soap.

Cresol Emulsion: This is another preparation that is used quite extensively with us as a substitute for a well-known proprietary article, sold under the trade name of "Lysol."

Green soap	250
Resin soap	100
Alcohol	150
Cresylic acid	450

The resin soap is made with common resin instead of linseed oil, and is added here to give this preparation a distinctive character, so as to distinguish it from the antiseptic soap described above.

Cresol emulsion is used in solutions of from 1 to 5 per cent. as an antiseptic, and for cleaning and sterilizing instruments, utensils, furniture and a hundred and one things that will stand washing with soap and water. It is also a cheap and at the same time a most efficient disinfectant.

Soap Liniment: The present formula for this popular liniment does not seem to meet with much popular approval, the bone of contention being of course the soap. Powdered soap is not only expensive, but often unreliable and certainly does not keep well in the powdered state. Having an undesirable but well-developed affinity for water, it soon becomes soggy and lumpy, and of course in this shape it does not at all come up to the requirements that are made for powdered soap by the Pharmacopœia.

The 1880 formula, while preferable in many respects, also had its deficiencies, chief among them being the tendency that soap has of becoming extremely hard when dry. This hardness not only makes it rather hard to cut, it also seems to interfere very materially with solution, a hard dry soap taking very much longer to dissolve than does a fresh or green soap.

To get over the many petty annoyances connected with the making of soap liniment and to have at the same time a means of

preparing this liniment extemporaneously, or at least at very short notice, it occurred to us that a soap might be made directly, from materials of known purity, thus insuring from the very first an element of positive knowledge as to the ingredients entering into the preparation.

The following formula has proven quite satisfactory, is easily followed, requires little time and very little attention.

Liquid Soda Soap: This is the stock solution or (stock-pot):

Liquid soda soap	200
Cotton seed oil	1,125
Sodium hydrate (90 per cent.)	175
Alcohol	1,250
Water	1,250

The liquid soda soap in this case is only added to facilitate the process of saponification. It is not essential, however, as the mixture, owing to the presence of a comparatively large amount of alcohol, readily saponifies.

The technique ordinarily followed is as follows: To the liquid soda soap in a large bottle add about 250 parts of alcohol and 750 of water, shake well and add the sodium hydrate, and allow it to dissolve; then gradually add the oil, shaking or stirring the mixture constantly; after the oil has been added, add the remaining portion of alcohol, and finally the water.

The resulting product should be light golden yellow in color, perfectly clear, transparent and limpid, mixing readily with alcohol, glycerin or carbolic acid without precipitation.

Soap Liniment: To make this preparation use:

Liquid soda soap	1,600
Camphor	360
Oil of rosemary	80
Alcohol	5,500
Water, to make	8,000

Dissolve the oil of rosemary and camphor in the alcohol; add the liquid soda soap, and finally the water. The whole process does not require more than a few minutes, and gives a product that stands well in all weather, not precipitating or becoming solid even at comparatively low temperatures.

SYRUPUS HYPOPHOSPHITUM.

BY F. W. HAUSSMANN.

Recommendations for improving this syrup may be briefly summed up as follows: (1) Increase in the amount of sugar. The Pharmacopœia directs 500 grammes in 1,000 c.c. of syrup. This is obviously insufficient, and should be increased to 700 grammes. (2) Increase in the amount of diluted hypophosphorous acid.

The Pharmacopœia directs 2 grammes of diluted 10 per cent. acid. This amount is insufficient to keep the calcium hypophosphite in solution. It has frequently been the writer's experience that precipitation takes place in the syrup which may be prevented by an increase of acid. If 2 grammes of the commercial 50 per cent. acid or 10 grammes of the 10 per cent. are used, a syrup less liable to deposit can be prepared. The property of the acid to increase the solubility of the calcium salt brings us to the third suggestion, a slight change in the manipulation in making the aqueous solution of the salt. The directions of the Pharmacopœia are as follows: Triturate the hypophosphites with 450 c.c. of water until they are dissolved, add the spirit of lemon and the hypophosphorous acid and filter the liquid.

Commercial calcium hypophosphite invariably leaves an insoluble residue when triturated with water. The addition of hypophosphorous acid increases the solubility of the calcium hypophosphite, and the directions should therefore read as follows: Triturate the hypophosphites with 350 c.c. of water, allow the undissolved portion to settle and pour off the clear solution. To the residue add the hypophosphorous acid, triturate until it is dissolved, mix the liquids, add the spirit of lemon and filter. In the filtrate dissolve the sugar by agitation without heat and strain.

In the writer's experience percolation furnishes a clearer syrup than if prepared by agitation. Incidentally it may be mentioned that the syrup sometimes acquires a terebinthinate odor, due to the oxidation of the lemon oil in the spirit.

In view of the points mentioned, the following formula is proposed for the syrup:

SYRUPUS HYPOPHOSPHITUM.

Calcium hypophosphite	45 grammes.
Potassium hypophosphite	15 "
Sodium hypophosphite	15 "

Diluted hypophosphorous acid	10 grammes.
Sugar	700 "
Spirit of lemon	5 c.c.
Water, a sufficient quantity to make 1,000 c.c.	

Triturate the hypophosphites with 350 c.c. of water and allow the undissolved portion to settle.

Pour off the clear solution, and to the residue add the diluted hypophosphorous acid and triturate until solution is effected.

Mix the liquids, add the spirit of lemon and filter. In the filtrate dissolve the sugar by agitation without heat, and add enough water through the filter to make the product measure 1,000 c.c.

Strain if necessary. The alternative process of percolation, as directed by the present Pharmacopœia, should be included in the official formula.

SYRUPUS FERRI IODIDI.

BY F. W. HAUSSMANN.

The experiments conducted were with the view of preparing a syrup of greater permanence. It is well known that the present official formula yields a less satisfactory syrup than the one of the 1880 Pharmacopœia. This is undoubtedly due to a deficiency in the amount of sugar, and several writers have pointed to the necessity of an increase.

Recently the importance of adding sugar to the solution of ferrous iodide, before mixing with the syrup or solution of the sugar, has been recognized. In preparing the syrup by the process of the 1880 Pharmacopœia, the necessity of a sugar addition becomes apparent. This formula omits directions to heat the iron solution to boiling and the washings are also directed to be made with cold distilled water. The washings are frequently cloudy and the finished syrup will lack transparency.

The presence of sugar in the iron solution prevents this cloudiness and the present Pharmacopœia very properly directs the washing to be done with a hot mixture of syrup and water.

This somewhat tedious method may be improved by diluting the solution of ferrous iodide, after reaction has ceased, with water to its full limit, heating it to boiling, adding a small amount of sugar

and filtering the hot mixture into syrup or upon sugar as the case may be. The latter, in view of the necessity of increasing the density of the syrup, is the preferable method.

To maintain stability of syrup of iodide of iron the addition of hypophosphorous acid has been highly recommended. Citric and hydriodic acid have also been proposed. The experiments of the writer have been conducted solely with hypophosphorous acid, a number of trials being made to determine the amount necessary to prevent discoloration of the syrup.

The addition of $\cdot 1$ to $\cdot 2$ ($\frac{1}{10}$ to $\frac{1}{5}$) per cent. has preserved a sugar-prepared syrup during two months. The following formula, for which no originality is claimed, is based upon the points mentioned. It is similar to the formula of Dr. Dohme, as presented to the Maryland Pharmaceutical Association and published in the Proceedings of the American Pharmaceutical Association of 1898.

The formula as published, probably inadvertently, directs the syrup to be made up to 1,000 c.c. where that number of grammes should be ordered.

SYRUPUS FERRI IODIDI.

Iron, in the form of bright wire and cut into small pieces,	25 grammes.	
Iodine	83	"
Sugar, in coarse powder	600	"
Diluted hypophosphorous acid	20	"
Distilled water, a sufficient quantity to make	1,000 grammes.	

Introduce the iron into a flask of thin glass, having a capacity of 500 c.c., add to it 200 c.c. of distilled water and afterwards the iodine. Shake the mixture occasionally, checking the reaction if necessary by the affusion of cold water, and, when the solution has acquired a greenish color and has lost the odor of iodine, dilute it with 75 c.c. of water and heat it to boiling. To the boiling solution add 25 grammes of sugar, and filter it through a strong, double, rapidly-acting filter placed in a funnel upon the rest of the sugar placed in a porcelain capsule.

Stir the mixture with a glass rod, heat it to the boiling point, and, having strained the syrup through linen into a tared bottle, add the hypophosphorous acid and enough distilled water to make the product weigh 1,000 grammes.

Lastly, shake the bottle and transfer the syrup to small vials, which should be completely filled.

SYRUPUS FERRI QUININÆ ET STRYCHNINÆ
PHOSPHATUM.

BY F. W. HAUSSMANN.

Easton's syrup has received a great deal of criticism from various sources. To British pharmacists it appears to be the source of considerable difficulty, and much of the knowledge pertaining to the syrup is the result of their painstaking investigations.

In a previous paper attention was called to the influence which acids exert upon official syrups, and this preparation was one of those mentioned.

The difficulty with Easton's syrup is the one common to all, namely, darkening due to caramelization.

This cannot be avoided as long as an excessive amount of free acid is present, and if the quantities of the original Aitkins' formula are adhered to a permanent syrup, as far as stability of color is concerned, is impossible.

To the pharmacists of the United States the present official formula is of sole importance. The Pharmacopœia of 1880 directs the syrup to be prepared directly from sugar, while the present edition, with the view of saving time, directs admixture of the concentrated solution of active ingredients to simple syrup. In either case the syrup will turn dark on standing. The various statements of the influence of light, the recommendation of keeping the syrup in a cool place and in amber-colored bottles, and similar suggestions, while possibly retarding, will not prevent this change.

Aside from this, the official formula is open to criticism in several minor respects. The Pharmacopœia directs the soluble ferric phosphate to be heated with water in a capsule until it is dissolved. The acid is now directed to be added, also the quinine sulphate and strychnine, and the mixture stirred until dissolved. No mention is made if the heat is to be continued or not. If solution is expected to take place without continuation of a gentle heat, the operator will be disappointed, as perfect solution will not take place.

The next step is the direction to filter the iron alkaloidal solution into the glycerin. This solution is a thick syrupy liquid, and much difficulty will be experienced in the attempt.

The necessity for filtration is not apparent, as, if carefully manipulated, a fairly clear solution will be obtained. Directions for filtering may therefore be omitted.

The writer would recommend substitution of quinine hydrochlorate for the sulphate, as solution takes place more readily in the acid mixture and continuation of heat may be dispensed with.

In comparing the present formula with the one of the 1880 Pharmacopœia, no preference can be given to either. Excepting the point mentioned regarding filtration of the alkaloidal solution, the present process requires less time.

Being acquainted with its cause, the only logical course to prevent discoloration appears to be to decrease the amount of phosphoric acid.

Calculated to weight, the amount of official 85 per cent. phosphoric acid is 8.2 grammes in 100 c.c., or, expressed, in apothecary weight, 5 grains to 1 fluidrachm. The attempt to reduce the amount of acid with the view of preparing a permanent syrup will meet with failure. If one-half of the amount, 24 c.c. in 1,000 c.c., or approximate quantities are employed, precipitation of the alkaloidal salts takes place, resulting in a cloudy preparation.

This will be the case no matter how the formula is manipulated, either in the case of simple admixture or dissolving the sugar in a diluted iron alkaloidal solution, or if quinine hydrochlorate is substituted for the sulphate.

It may be gleaned from the above results that the difficulties with this preparation are manifold, and under existing conditions it is impossible to suggest a remedy. It is, however, an open question if to American pharmacists a reliable formula for a compound syrup of the hypophosphites, containing iron, quinine and strychnine, which would enjoy the confidence of physicians, would not be a desirable substitute for this comparatively obsolete preparation.

A CHEMICAL CLASSIFICATION OF ODORIFEROUS PRINCIPLES.

BY SAMUEL P. SADTLER.¹

One of the most satisfactory and complete attempts at the classification not only of the numerous constituents of the natural essential oils, but of the various chemical substances that enter into the composition of perfumes, natural and artificial, has been recently put forward by Dr. Erdmann, in a lecture before a section of the Association of German Chemists.

¹ A translation with notes from the German of ERNST ERDMANN (*Zeits. für angewandten Chemie*, 1900, pp. 103-116).

So much has been added to our knowledge of the essential oils in recent years, and so much has been done in the line of synthetic work in this domain, that a survey of the whole material from the chemical standpoint is very welcome.

The author points out that we must first of all concede that if a substance is to act upon the olfactory nerves it must be volatile. But all gases do not act upon the sense of smell, and so we must seek for a reason for the activity. He is inclined to believe that it resides in the development of a true chemical reaction between the odoriferous volatile substance and the protoplasmic matter of the cells forming the olfactory nerves. Thus the action of aldehydes, to which class a large number of odoriferous principles belong, upon protein substances has been noted and recently made the basis of a patent application by the Elberfeld Farbenfabrik Co. When two substances of different chemical constitution like nitrobenzene and benzaldehyde seem to possess the same odor, we have an anomaly, but we have similar anomalies in the similarity of taste of cane sugar and saccharine.

The author calls attention, in considering the action of a perfume, to the difference between quality of odor and intensity or penetrating power of the same. The first he considers to be absolutely dependent upon the chemical constitution of the perfume; the second, while somewhat dependent upon chemical nature, is rather connected with its physical properties, such as volatility and special conditions of admixture with air or vapors of other volatile bodies such as, for instance, alcohol.

He divides the distinctive odoriferous principles into seven main groups, viz.: (1) aldehydes; (2) alcohols and esters; (3) ketones; (4) phenols and phenol ethers; (5) acid and acid anhydrides; (6) nitrogenous substances; (7) hydrocarbons.

The first and most important class are the *aldehydes*. The lowest members of this class, the aldehydes of the fatty series, like formaldehyde, acetaldehyde, butyraldehyde, valeraldehyde, are, it is true, found at times in essential oils, but the author does not include them in his list, as they are irritating and unpleasant in odor, contributing in no way to the value of a perfume.

This group includes, as is seen, several interesting substances of artificial or synthetic manufacture, such as citral, benzaldehyde, cinnamic aldehyde, vanillin and piperonal.

The group of *alcohols* and *esters* includes the esters of the lower fatty acids known as "fruit essences," as well as the esters of the unsaturated alcohols geraniol and linalool, which are so characteristic of many of the essential oils.

The group of *ketones* includes camphor and a number of interesting and characteristic principles of essential oils, including the two newest, irone and ionone.

The group of *phenols* and *phenol ethers* includes the well-known eugenol, safrol and anethol, besides thymol and others.

Under the group of *acids* we have benzoic and cinnamic acids, which occur both free and in ester combination, and under *acid anhydrides* we have coumarin.

In the group of *nitrogen-containing perfumes* we have a variety, although none of pre-eminent value.

The last group, that of *hydrocarbons*, of course includes the terpenes, which are the basis of many of the most important essential oils.

The tables are given below in full, with names, constitutional formulas, compounds and natural occurrence.

CLASSIFICATION OF THE MOST IMPORTANT DISTINCTIVE PERFUMES.

First Group: Aldehydes.

Nos. 1 to 2, unsaturated, with open chains; No. 3, closed chain; Nos. 4 to 11, closed chain, Benzol series.

No.	Name.	Formula.	Natural Occurrence.
1	Citral	$\begin{array}{c} \text{CH}_3 \\ \\ \text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\text{C}=\text{CH}-\text{CHO} \\ \\ \text{CH}_3 \end{array}$	{ Lemon oil, lemon grass oil.
2	Citronellal (Citronellon)	$\begin{array}{c} \text{CH}_3 \\ \\ \text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CHO} \\ \\ \text{CH}_3 \end{array}$	{ Citronella oil, lemon oil and eucalyptus maculata.
3	Furfurol	$\begin{array}{c} \text{CH}-\text{CH} \\ \quad \\ \text{CH} \quad \text{C}-\text{CHO} \\ \diagdown \quad / \\ \text{O} \end{array}$	{ Clove oil.
4	Benzaldehyde	$\text{C}_6\text{H}_5-\text{CHO}$	{ Bitter almond oil, cherry laurel oil.
5	Phenylacetaldehyde	$\text{C}_6\text{H}_5-\text{CH}_2-\text{CHO}$	
6	Cinnamic aldehyde	$\text{C}_6\text{H}_5-\text{CH}=\text{CH}-\text{CHO}$	{ Oils of cassia and cinnamon. Roman chamomile oil.
7	Cumin aldehyde	$\text{C}_6\text{H}_4.\text{C}_3\text{H}_7.\text{CHO}$	
8	Salicylic aldehyde	$\text{C}_6\text{H}_4.\text{OH}.\text{CHO}$	{ Oil of spiræa and crepis foetida.
9	Anisic aldehyde (Aubépine)	$\text{C}_6\text{H}_4.\text{OCH}_3.\text{CHO}$	
10	Vanillin	$\text{C}_6\text{H}_3.\text{OH}.\text{OCH}_3.\text{CHO}$	{ Vanilla, benzoin, Peru balsam and beet sugar.
11	Heliotropine (Piperonal)	$\text{C}_6\text{H}_3.\text{OCH}_2\text{O}.\text{CHO}$	

Second Group: Alcohols and Esters.

Nos. 1 to 4, saturated, with open chains; Nos. 5 to 7, unsaturated, with open chains; No. 8, closed chain; Nos. 9 to 13, closed chain, Terpene series; Nos. 14 to 15, closed chain, Benzol series.

No	Name and Formula.	Joined to.	Natural Occurrence.
1	Methyl alcohol CH_3OH	Benzoic acid (Niobe oil). Salicylic acid (wintergreen oil).	Clove oil. — { Gaultheria procumbens, betula lenta.
2	Ethyl alcohol $\text{C}_2\text{H}_5\text{OH}$	Formic acid (rum essence). Acetic acid (acetic ether). Butyric acid (banana essence). Isovalerianic acid (apple oil). Pelargonic acid (artificial cognac essence).	— — Wine vinegar cognac, in a g-nolia fuscata (?) — — —
3	Isobutyl alcohol $\begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array} \text{CH}-\text{CH}_2\text{OH}$	Isobutyric acid. Angelic acid.	Potato fusel oil. { Roman chamomile oil.
4	Isoamyl alcohol $\begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array} \text{CH}-\text{CH}_2-\text{CH}_2\text{OH}$	Acetic acid. Isovalerianic acid (apple essence). Caprylic acid } Capric acid } Onanth-Ether.	{ Potato fusel oil. Peppermint oil. — Cognac oil.
5	Rhodinol (geraniol) $\begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array} \text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\underset{\text{CH}_3}{\text{C}}=\text{CH}-\text{CH}_2\text{OH}$	—	{ Rose oil, geranium oil, citronella oil, lemon grass oil.
6	Linalool $\begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array} \text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\underset{\text{CH}_3}{\text{C}}(\text{OH})-\text{CH}=\text{CH}_2$	Acetic acid.	Neroli oil. { Oils of linaloë, bergamot, lavender, neroli, jasmine.
7	Citronellol $\begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array} \text{C}=\text{CH}-\text{CH}_2-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_2\text{OH}$	Acetic acid.	{ Oils of bergamot and neroli. Rose oil, citronella oil.
8	Furfuryl alcohol $\begin{array}{l} \text{CH} \\ \text{CH} \end{array} \text{—CH—CH} \\ \parallel \quad \parallel \\ \text{CH} \quad \text{O} \quad \text{C}=\text{CH}_2\text{OH}$	—	Coffee oil.
9	Borneol $\text{C}_{10}\text{H}_{17}\text{OH}$ $\begin{array}{c} \text{CH}_2 \quad \text{CH}_2 \\ \diagdown \quad \diagup \\ \text{C} \quad \text{C} \\ \diagup \quad \diagdown \\ \text{CH}_3 \quad \text{CH}_3 \\ \diagdown \quad \diagup \\ \text{C} \quad \text{C} \\ \diagup \quad \diagdown \\ \text{CH}_3 \quad \text{CH}_3 \\ \diagdown \quad \diagup \\ \text{CH} \quad \text{CH} \\ \diagdown \quad \diagup \\ \text{CH} \quad \text{OH} \quad \text{CH}_2 \end{array}$	—	Borneo camphor. Nagai camphor. Rosemary oil.
		Acetic acid. Isovalerianic acid.	{ Pine-needle oil. Oils of valerian and Japanese valerian.

Second Group: Alcohols and Esters—Continued.

No.	Name and Formula.	Joined to.	Natural Occurrence.
10	Terpineol $C_{10}H_{17}.OH$	—	{ Cajuput oil, car- damom oil.
11	Menthol $C_{10}H_{19}.OH$	—	
12	Eucalyptol (Cineol) $C_{10}H_{18}.O$	—	{ Oil of Satonica. Eucalyptus oil.
13	Peruvial $C_{13}H_{22}O$	—	
14	Benzyl alcohol $C_6H_5-CH_2.OH$	—	{ Oil of jasmine flowers. Oil of jasmine flowers. Balsam of Peru.
		Acetic acid.	
15	Cinnamic alcohol $C_6H_5-CH=CH-CH_2.OH$	—	Storax.
		Benzoic acid. Cinnamic acid.	

Third Group: Ketones.

Nos. 1 to 2, saturated, with open chain; Nos. 3 to 4, unsaturated, with open chains; Nos. 5 to 12, closed chain, Terpenes.

No.	Name.	Formula.	Natural Occurrence.
1	Methylamyl ketone	$CH_3-CO-C_5H_{11}$	Clove oil. Rue oil.
2	Methylnonyl ketone	$CH_3-CO-C_9H_{19}$	
3	Methylheptenone	$\begin{array}{l} CH_3 \\ \diagdown \\ C=CH-CH_2-CH_2-CO-CH_3 \end{array}$	{ Linaloë oil, lemon grass oil.
4	Pseudojonone	$\begin{array}{l} CH_3 \\ \diagdown \\ C=CH-CH_2-CH_2-C=CH-CH=CH-CO-CH_3 \\ \diagup \\ CH_3 \end{array}$	
5	Carvone	$C_{10}H_{14}O$	Caraway oil.
6	Camphor of Laurinæ (Camphor)	$\begin{array}{c} CH_2 \qquad \qquad \qquad CH_2 \\ \diagdown \qquad \qquad \qquad \diagup \\ \qquad \qquad \qquad CH_3 \\ CH_3-C \qquad \qquad \qquad C \\ \diagup \qquad \qquad \qquad \diagdown \\ CO \qquad \qquad \qquad CH_2 \end{array} CH$	{ Camphor wood.
7	Fenchone	$C_{10}H_{16}O$	{ Fennel oil, thuja oil.
8	Thujone (Tanacetone)	$C_{10}H_{16}O$	
9	Pulegone	$C_{10}H_{16}O$	{ Oil of penny- royal. Peppermint oil.
10	Menthone	$C_{10}H_{18}O$	
11	Irone	$C_{13}H_{20}O$	{ Orris root. Violet root.
12	Ionone	$\begin{array}{l} CH_3, C \quad CH_3 \\ H_2C \quad \diagdown \quad \diagup \quad CH-CH=CH-CO-CH_3 \\ \qquad \qquad \qquad \diagup \quad \diagdown \\ H_2C \quad \qquad \qquad C.CH_3 \\ \qquad \qquad \qquad CH \end{array}$	

Fourth Group : Phenols and Phenol Ethers.

Nos. 1 to 9, Benzol series ; No. 10, Naphtaline series.

No.	Name.	Formula.	Natural Occurrence.
1	p-Cresol methyl ether	$C_6H_4.OCH_3.CH_3$	Ylang-ylang oil.
2	Guaiacol	$C_6H_4.OCH_3.OH$	Birch oil, beech wood tar.
3	Creosol	$C_6H_3.OH.OCH_3.CH_3$	Birch oil.
4	Anethol	$C_6H_4.OCH_3.CH=CH-CH_3$	Anise oil, star anise oil, fennel oil.
5	Chavicol	$C_6H_4.OH.CH_2-CH=CH_2$	Betel oil.
6	Estragol	$C_6H_4.OCH_3.CH_2-CH=CH_2$	Estragon oil.
7	Thymol	$C_6H_3.C_3H_7.OH.CH_3$	Thyme oil.
8	Eugenol	$C_6H_3.OH.OCH_3.CH_2-CH=CH_2$	Clove oil.
9	Safrol	$C_6H_3.OCH_2O.CH_2-CH=CH_2$	Sassafras oil, camphor oil.
10	β -Naphthol methyl ether (Nerolin)	$C_{10}H_7.OCH_3$	

Fifth Group : Acids and Acid Anhydrides.

Nos. 1 to 2, unsaturated, with open chain ; Nos. 3 to 5, closed chain, Benzol series.

No.	Name.	Constitutional Formulæ.	Natural Occurrence.
1	Angelica acid	$CH_2=CH-CH(CH_3)-COOH$	As an ester in Roman chamomile oil.
2	Tiglic acid	$CH_3-CH=C(CH_3)-COOH$	As an ester in Roman chamomile oil and croton oil.
3	Benzoic acid	C_6H_5-COOH	Balsam of Peru, benzoin and Tolu balsam.
4	Cinnamic acid	$C_6H_5-CH=CH-COOH$	{ Balsam of Peru, Tolu balsam, benzoin (Sumatra), storax.
5	Coumarin	$\left\{ \begin{array}{l} CH=CH-CO \\ C_6H_4 \\ O \end{array} \right\}$	Touca bean, wood-roof (asperula odorata).

Sixth Group : Nitrogen-containing Perfumes.

Nos. 1 to 3, with open chains ; No. 4, closed chain ; Nos. 5 to 12, closed chain, Benzol series.

No.	Name.	Formula.	Natural Occurrence.
1	Trimethylamine	$N(CH_3)_3$	Oil of chenopodium.
2	Hydrocyanic acid	$CN H$	{ Bitter almond oil, cherry laurel oil.
3	Allyl mustard oil	$C_3H_5.NCS$	{ Mustard oil, horseradish, aria officinalis.
4	Pyrrol	$\left\{ \begin{array}{l} CH=CH \\ \\ CH=CH \\ \\ CH=CH \\ \\ C_2H_4 \end{array} \right\} NH$	{ As a derivative in orange oil from unripe fruits.
5	Indol	$\left\{ \begin{array}{l} CH=CH \\ \\ CH=CH \\ \\ C_6H_4 \end{array} \right\} NH$	Jasmine oil.
6	Phenyl acetic acid nitrile (Benzylcyanide)	$C_6H_5-CH_2.CN$	{ Cress oil (Lepidium sativum, Tropæolum majus).
7	Mandelic acid nitrile	$C_6H_5-CH(OH).CN$	Almond oil.
8	Nitrobenzol (Mirbane oil)	$C_6H_5NO_2$	—
9	Tonquinol (Musk Baur)	$C_6H_4.(NO_2)_3.C_4H_9.CH_3$	—
10	Anthranilic acid methyl ester	$C_6H_4.NH_2.COCH_3$	Neroli, jasmine oil.
11	Anthranil	$\left\{ \begin{array}{l} CO \\ \\ C_6H_4 \\ \\ NH \\ \\ CH=CH \\ \\ N=CH \end{array} \right\}$	—
12	Quinoline	$\left\{ \begin{array}{l} CO \\ \\ C_6H_4 \\ \\ CH=CH \\ \\ N=CH \end{array} \right\}$	—

Seventh Group : Hydrocarbons.

Nos. 1 to 10, closed chain, Terpene series ; Nos. 11 to 12, closed chain, Benzol series.

No.	Name.	Formula.	Natural Occurrence.
1	Pinene	$C_{10}H_{16}$	{ d ¹ : German turpentine oil, American turpentine oil; 1: French turpentine oil.
2	Camphene	$C_{10}H_{16}$	{ d: Ginger and spike oils; 1: oils of citronella and valerian.
3	Fenchene	$C_{10}H_{16}$	{ French turpentine oil (?)
4	Limonene	$C_{10}H_{16}$	{ d: Oils of orange peel, lemon and bergamot; 1: fir oil; i: (dipentene); camphor oil.
5	Sylvestrene	$C_{10}H_{16}$	{ Swedish and Russian turpen- tine oil.
6	Phellandrene	$C_{10}H_{16}$	{ d: Water yarrow oil; elemi oil; 1: Australian eucalyptus oil.
7	Terpinene	$C_{10}H_{16}$	Cardamom oil.
8	Terpinolene	$C_{10}H_{16}$	—
9	Cadinene	$C_{15}H_{24}$	Oil of cade.
10	Caryophyllene	$C_{15}H_{24}$	Clove oil.
11	Cymol	$C_6H_4 \cdot CH_3 \cdot C_9H_7$	{ Oil of cuminum cyminum, thyme oil.
12	Styrol	$C_6H_5-CH=CH_2$	Storax.

¹d = dextrorotatory ; 1 = lævorotatory ; i = inactive.

SYRUPUS AMYGDALÆ.

BY F. W. HAUSSMANN.

On account of the liability of decomposition, syrup of almond is best prepared recently, although such is not stated specifically by the Pharmacopœia. For extemporaneous preparation the present official formula is more suitable than those of former editions. The official directions are, however, liable to cause confusion in several respects.

In the summary of the quantities, 200 c.c. of water are ordered, whereas in the directions for manipulation 330 c.c. are used. The final measure is directed to be made up to 1,000 c.c. with *water*, where syrup is obviously intended. A point in the directions may also be called attention to. The almonds are directed to be rubbed in a mortar with 100 grammes of sugar and 30 c.c. of water to a smooth paste. With the given amount of water only a mass can be obtained and the quantity used for trituration should be increased.

In comparison with the formula of the 1880 Pharmacopœia, the present one is to be preferred. While trituration of the almonds with a larger quantity of water may produce a more perfect emulsion, cohesion is destroyed if the sugar is dissolved by agitation. Continental pharmacopœias direct a greater sugar percentage and

solution by heat. Syrups thus prepared do not possess the milky whiteness of the U.S.P. preparation, and in point of stability have apparently little advantage.

Perhaps worthy of mention is syrup of almond as proposed by Dieterich, which contains 5 per cent. of acacia and is prepared by heat. For counter sale this formula is claimed to furnish a permanent preparation.

The syrup of the United States Pharmacopœia separates on standing. To increase stability, a quantity of granulated acacia may be employed while preparing the emulsion. Gum arabic is used in preparing emulsion of almonds and should not be objectionable in the syrup.

The syrup prepared by the following formula does not separate as readily as the official preparation.

SYRUPUS AMYGDALÆ.

Sweet almond	140 grammes.
Bitter almond	40 "
Acacia, in granular powder	10 "
Sugar	200 "
Orange-flower water	100 c.c.
Water	300 "

Syrup, a sufficient quantity to make the syrup measure 1,000 c.c.

Rub the almonds, previously blanched, in a mortar, with the acacia and 100 grammes of sugar, and 50 c.c. of water to a smooth paste. Mix this well with the orange-flower water and 100 c.c. of water and strain with strong expression. To the residue add 150 c.c. of water and express again. In the strained liquid dissolve the remainder of the sugar without heat and add a sufficient quantity of syrup to make the product measure 1,000 c.c. Mix thoroughly.

RECENT LITERATURE RELATING TO PHARMACY.

CONSTITUENTS OF TOBACCO SMOKE.

At a recent meeting of the German Scientists' Association, Professor Thoms read a paper on tobacco smoke (*Suddtsch. Ap. Zt.*, 1899, 650). It is an interesting account of a careful investigation, the greater part being performed with the smoke of artificially aspirated cigars. Omitting details, the sulphuric acid through which the smoke passed contained *nicotine*, *ammonia* and *pyridine*; to solution

of soda in the second wash bottle, the smoke gave up *carbonic* and *butyric acids*, but no hydrocyanic acid; while traces of a *volatile oil* and of *carbon monoxide* were likewise detected in the smoke.

That the pyridine was a decomposition product of the nicotine was shown by the fact that the smoke from the cigars from which the nicotine was removed yielded no pyridine. It is interesting to note that the cigar "stump" contained a much larger percentage of nicotine than did the whole cigar. Thus twenty cigars weighing 78 grammes contained 1.12 per cent. nicotine; while the stumps from same, weighing 4.57 grammes, contained 4.34 per cent. The carbon monoxide in the smoke from 1 kilo tobacco, estimated by precipitation of palladium chloride solution, amounted to but 20 c.c.

It was found that if 15 kilos tobacco was distilled with steam, 6 grammes of a green, oxygenated, phenol-bearing oil was obtained. On the other hand, from the smoke of 20 kilos tobacco there was separated 75 grammes dark brown oil, so irritating and malodorous that work with it was very trying. It consisted of a trace of pyridine, a phenol boiling at 190°–200°, a small quantity of furfural and a residue boiling at 200°–260°, containing sulphur and nitrogen and no terpenes.

H. V. A.

BETULIN.

C. J. Reichart (*Ph. Cent.*, 1899, 587) reports on a dye-stuff obtained from the bark of *Betula alba*, by cooking bark in alkali and precipitating with hydrochloric acid. The yield is 20 per cent. and the product is a red-brown powder, soluble in alcohol and hot glycerin.

He has patented the product and recommends it for tinting cosmetics and the like, the shade produced being red-brown to rose, according to amount employed. It is precipitated from solution by acids, quinine sulphate and lead acetate, and, as ferric chloride colors it green-black, it is presumably a tannoid.

H. V. A.

NOTES ON HONEY.

Supplemental to his previous work on honey, Dr. Haenle (*Ph. Zt.*, 1899, 742) contributes some interesting notes.

Bees fed exclusively on a 33 per cent. sugar solution, the polarization angle of which was +96°, yielded a honey containing dextrin and polarizing at –3°. Curiously enough, the same sugar solution,

inverted by tartaric acid to -13° , yielded a similar but dextrin-free honey, likewise polarizing at -3° . The same bees, allowed freedom, deposited a natural dextrin-free honey polarizing at -35° . The writer noticed that his bees brought honey in August—practically at the close of flowering time—and, seeking cause, traced the insects to a neighboring preserve factory. Here the insects sought their supplies from the fresh fruit rather than from the abundant sugar, showing their preference to invert sugar.

The honey from this source contained traces of dextrin and polarized at -12° to -15° . The article closes with a report on examination of a commercial honey made from equal parts of natural honey and pure inverted sugar. Such sophistications can be easily detected, since they polarize at about -50° .

NORWEGIAN TAR.

Dr. K. Strom (*Arch. Pharm.*, 1899, 525) reports a careful examination of the tar of *Pinus sylvestris*. By fractional distillation and by chemical separation and identification, he finds the tar contains 4.75 per cent. volatile acids, 10.94 per cent. phenols and 60.80 per cent. hydrocarbons. The acids found were formic, acetic, propionic, normal butyric, normal and Reynard's valerianic, methyl propyl acetic, normal capronic, œnanthic and caprylic and possibly pelargonic, caprinic and pimarinic; while the phenols were cresol, guaiacol creosol, ethyl-guaiacol, propyl guaiacol, and two bodies, $C_{11}H_{16}O_2$ and $C_{12}H_{14}O_2$. The hydrocarbons are very numerous and difficultly separable. The most noteworthy of these is retene, $C_{18}H_{18}$.

H. V. A.

THE SUGARS IN CAROB SEED DURING GERMINATION.

E. Bourquelot and H. Hérissey, *Comp. rend.*, 129, 614, have shown that there is developed, during germination of the separated embryos, a soluble ferment, which, acting on the albumen of the seed, produces a reducing sugar; 250 grammes of the seed yielded nearly 7 grammes of the sugar, which proved to consist of mannose and galactose, in the proportion of about 4 to 1.

L. F. K.

ANALYSIS OF ASAFETIDA.

Mr. Russell W. Moore, *J. Soc. Chem. Ind.* (1899), 18, 987, gives the per cent. of resin content of 164 samples of asafetida. Only

six out of this number contained above 45 per cent. of resin. The samples were taken from asafoetida considered to be deficient in percentage content of resin. The articles of high quality were not sampled, consequently very guarded conclusions must be drawn.

L. F. K.

METHYL ALCOHOL, FURFUROL AND DIACETYL IN CARAWAY RUNNINGS.

It has been found that the first runnings of water during the process of distilling caraway oil from the seed contain, as is the case with cloves, methyl alcohol and furfural. In both cases the methyl alcohol is colored intensely yellow. This coloration cannot be removed by distillation. From certain reactions this body is considered diacetyl.—*Schimmel's Report*, Oct., 1899, p. 11.

L. F. K.

THE ELECTROLYTIC PREPARATION OF CHLOROFORM.

L. Zambelletti-Mailand has established a plant at Como for manufacturing chloroform by an electrolytic process. A 20 per cent. sodium chloride solution is placed in a lead-lined still, provided with a rotating carbon shovel, which serves the double purpose of an agitator and an anode. The still is heated by steam. An electric current of from 5 to 6 ampères is passed, and when the temperature reaches 100° C., acetone is slowly introduced from the bottom. The nascent chlorine developed acts on the acetone, forming first trichlor-acetone, which is next broken up by the sodium hydrate produced into chloroform and sodium acetate. Theoretically, 100 pounds of acetone should yield 210 pounds of chloroform, but thus far only 180 pounds have been obtained in practice.—V. Lucchini, *L'Electricita*, 1899, 8, 664; through *Chem. Zeit. (Rep.)*, 1899, Vol. 23, p. 336.

L. F. K.

BECCHI REACTION FOR COTTON-SEED OIL.

The presence of sulphur in cotton-seed oil has been considered doubtful. Soltsien found that oil obtained by the medium of petroleum spirits did contain sulphur, but cold expressed oil gave a doubtful reaction for sulphur.

Becchi's reaction is due not only to the reduction of the silver, but also to the production of silver sulphide, if sulphur is present.—P. Soltsien, *Ztsch. öffentl. Chem.*, 5, 306; from *Chem. Centralblatt* (1899), 2, 539.

L. F. K.

DETERMINATION OF VANILLIN IN VANILLA.

Mr. Busse removed and estimated the vanillin by the usual method: extraction with ether, removal from the ethereal extractive by means of sodium bisulphite, etc.

Tiemann and Haarmann found:

	Per Cent. of Vanillin.
Best Mexican bean to contain from	1'69 to 1'86
Bourbon variety contained from	1'91 to 2'90
Java bean contained	2'75

The author found:

German E. African vanilla to contain	2'16
Ceylon " " "	1'48
Tahiti " " "	1'55 to 2'02

There does not appear to be any relation between the amount of vanillin present in a bean and its value as a flavoring agent, since the most aromatic and best flavored vanilla frequently contains less vanillin than a vanilla of inferior quality. The aroma and flavor are, therefore, not entirely due to vanillin.—*Arb. Kaiserl. Ges.* (1898), 15, 1; through *J. Soc. Chem. Ind.*, 18, 952. L. F. K.

THE ANALYSIS OF LUPULIN.

Hager's "Kommentar," second edition states that lupulin should not contain more than 10 per cent. of ash and yield at least 70 per cent. of ether extractive. The U.S.P. prescribes a limit of 10 per cent. of ash, but the B.P. allows 15 per cent.

Mr. R. W. Moore prefers drying and weighing the residue to drying the extractive and weighing it; because the latter procedure always occasions loss, by volatilization of the more fugitive bodies. The analytical results of twenty-five samples are given; of these only *two* contained less than 10 per cent. of ash and twelve contained more than 70 per cent. of extractive. There does not appear to be any ratio between ash content and ethereal extractive. The old and inferior lupulin contained less ash than the article of superior quality. This is due to the fact that new lupulin is very sticky, causing the adhesion of much more foreign matter than the old. From these analyses it would appear that 15 per cent. of ash would be more nearly correct than 10 per cent., as is now required.—*J. Chem. Soc. Ind.* (1899), 18, 987. L. F. K.

PREPARATION OF VERMUTH IN EUROPE.

In France the production of vermuth is almost entirely confined to Marseilles. It is an infusion of bitter, aromatic plants, herbs and roots in a good white wine (generally fortified). The ingredients are almost legion, and the number of formulæ are almost unlimited, each manufacturer using a private combination.

Italy is the largest producer of vermuth, and the most highly esteemed is made in and around Turin. On a large scale, vermuth is made by preparing an alcoholic extract of the herbs by digesting them in 95 per cent. alcohol at 120° F. for eight days, then warming to a moderate degree over a slow fire for twelve hours, finally press the solid ingredients and filter. The filtered liquid is added to the wine as desired. The alcoholic strength of vermuth lies between 15 per cent. and 17 per cent.

The following formula serves as an example of the ingredients employed in making the extract: alcohol, 90 per cent., 8 litres; coriander seed, 800 grammes; nutmeg, Greek nuts, Peruvian bark and sweet flag, each, 200 grammes; wormwood, sharp, and Roman wormwood, each, 720 grammes; sweet marjoram and yarrow, each, 180 grammes; rose leaves, cloves and Ceylon cinnamon, each, 100 grammes; dittany and sem. angelica, each, 50 grammes; and hyssop, 150 grammes.—*U. S. Consular Reports*, 1899, 60 (227), 599.

L. F. K.

PHILADELPHIA HOSPITAL FORMULARY.

[Continued from page 182.]

Liquor Hydrargyri Chloridi Corrosivi.

(1-2000, 1-1500, 1-1000.)

Liquor Hydrargyri Chloridi Corrosivi Fortior (1-8).

Mercuric Chloride, Cor.	6 dr.	24 gm.
Ammon. Chloride	4 dr.	16 gm.
Water, Distilled, to measure	6 fl. oz.	180 c.c.

One teaspoonful added to one pint of water yields a 1-1000 solution of Corrosive Mercuric Chloride.

Liquor Lithii Bromidi.

Each teaspoonful contains :

Lithium Bromide	7.5 gr.	0.5 gm.
Solution, Potass. Citrat.	30 m.	2 c.c.
Water, Peppermint, to measure	1 fl. dr.	4 c.c.

Dose: One to four teaspoonfuls.

Liquor Potassii Permanganatis.

Potassium Permanganate	3 dr.	12 gm.
Water, Distilled, boiling, to measure	6 fl. oz.	180 c.c.

One teaspoonful added to one pint of water yields a 1-2000 solution of Potassium Permanganate.

Liquor Sodii Phosphatis.

Each teaspoonful represents about 60 grains (4 gm.) of crystallized Sodium Phosphate and 15 grains (1 gm.) of 50 per cent. Phosphoric Acid in water.

Dose: One or two teaspoonfuls in a wineglassful or more of water, preferably hot, three times a day, one hour before meals.

Liquor Strontii Bromidi.

Each teaspoonful contains:

Strontium Bromide	7.5 gr.	0.5 gm.
Water, Chloroform	30 m.	1.8 c.c.
Water, Bitter Almond, to measure	1 fl. dr.	4 c.c.

Dose: One to four teaspoonfuls.

LOTIONES.

Lotio Plumbi et Opii.

(Lead Water and Laudanum.)

Tr. Opium	3 fl. dr.—1 fl. oz.	12 c.c.—30 c.c.
Water, Lead to measure	6 fl. oz.—1 pt.	180 c.c.—475 c.c.

P. H.

MISTURÆ.

Mistura Astringens.

Each tablespoonful contains:

Extract, Logwood	10 gr.	0.6 gm.
Ac. Sulph., Aromat.	10 m.	0.6 c.c.
Tr. Opium, Camph.	20 m.	1.2 c.c.
Water, Cinnamon,		
Syrup, Ginger, of each, to measure	4 fl. dr.	15 c.c.

Dose: Tablespoonful.

Mistura Alterans Compositus.

Each teaspoonful contains:

Tr. Prickly Ash	10 m.	0.6 c.c.
Ext. Lappa Minor, Fl.	15 m.	1 c.c.
Ext. Phytolacca, Fl.	15 m.	1 c.c.
Ext. Stillingia, Fl.	15 m.	1 c.c.
Ext. Sarsap., Comp., Fl., to measure	1 fl. dr.	4 c.c.

Dose: Teaspoonful.

Mistura Argenta Composita.

Each teaspoonful contains:

Silver Nitrate	$\frac{1}{8}$ gr.	0.004 gm.
Water, Chloroform, to measure	1 fl. dr.	4 c.c.

Dose: One teaspoonful.

Mistura Ammonii Carbonatis.

Each dessertspoonful contains :

Ammon. Carbonate	5 gr.	0·32 gm.
Mucilage, Acacia	30 m.	6 c.c.
Oil, Gaultheria	½ drop.	0·03 c.c.
Oil, Sassafras	½ drop.	0·03 c.c.
Water, Peppermint, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful to tablespoonful.

Mistura Ammonii Chloridi et Strychninæ.

Each teaspoonful contains :

Ammonium Chloride	5 gr.	0·32 gm.
Strychnine Sulphate	⅓ gr.	0·002 gm.
Water, Chloroform, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Mistura Bromidia.

Each teaspoonful contains :

Sodium Bromide	2·5 gr.	0·15 gm.
Ammon. Bromide	2·5 gr.	0·15 gm.
Potass. Bromide	5 gr.	0·32 gm.
Syrup, Ginger	15 m.	1 c.c.
Water, to measure	1 fl. dr.	4 c.c.

Dose : One to four teaspoonfuls.

Mistura Bromidicæ et Arsenicæ.

(Epileptic Mixture.)

Each teaspoonful contains :

Potass. Bromide	7·5 gr.	0·5 gm.
Sodium Bromide	7·5 gr.	0·5 gm.
Sol. Potass. Arsenite	1 m.	0·06 c.c.
Water, Peppermint	10 m.	0·6 c.c.
Inf. Gent., Comp., to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

EDITORIAL.

THE U. S. PHARMACOPŒIA.

When the May issue of this JOURNAL shall have reached our readers the next National Convention for the Revision of the Pharmacopœia of the United States will be about ready for work. While it is usual for considerable interest to be manifested in the actions of the Convention, it is doubtful if there ever was a time when there was so much interest displayed by so many different parties. The interests involved are not only those of physician and apothecary, manufacturing chemist and retail pharmacist, but the consumer and Commissioner of Foods and Drugs as well. There never

was a time when there were so many points of view (scientific, medicinal and commercial) from which to consider the Pharmacopœia and so many criticisms and suggestions put forth. The occasion is a peculiar and momentous one, and yet there never was a time, probably, when all concerned had greater respect and confidence in the ability of the Chairman, who will doubtless be re-elected. His own words on the exigencies of the work of revision are stronger than those of any other writer on this subject. He says: "If the Pharmacopœia is to be gradually purged of old and useless drugs and preparations, and not to be brought up to date by the introduction of the newer drugs of recognized value used universally by the medical profession, it might just as well remain unrevised and go out of existence."¹

We may look, therefore, for changes to be made that are in accord with the advances of the sciences and the commerce of the past ten years, and that will be of a character fitting the first revision of the twentieth century. We will give our readers as full and careful an account as possible of the work of the Convention in the June issue of this JOURNAL.

EDITORIAL NOTES AND COMMENTS.

THE DAILY NEWSPAPER AND NOSTRUMS.

However the people of this country may look upon the attempts of a minister of the gospel to run a daily newspaper as Christ would have managed it, we must acknowledge that like the editor of *Pediatrics*: "We should be interested to know, incidentally, what character of advertisements of patent medicines, nostrums and 'catarrh cures' (with a string of clergymen's testimonials) the new editor deems fit to be published in a 'Christian' daily newspaper." Indeed, we think the editor's pencil might perhaps find freer course among the advertisements of the daily paper than anywhere else.

THE USE OF PREPARATIONS OF CRUDE DRUGS AND ACTIVE PRINCIPLES.

In reply to a letter to a well-known firm of manufacturing chemists, Messrs. Billings, Clapp & Co., of Boston, relative to the comparative use of the active principles of drugs and the preparations

¹ AM. JOUR. PHARM., 1899, p. 561.

of crude drugs, we received the following, which we are permitted to publish:

“DEAR SIR:—Referring to your inquiry of the third, it is our opinion that the use of active principles of drugs is increasing more rapidly than the use of the ordinary preparations of the same drugs. This is especially the case with morphine and codeine. The sale of opium preparations seems to be dropping off, but the demand for the alkaloid, especially codeine, is increasing all the time. The same is true of cocaine and strychnia. In the case of some of the other principles, we do not think this applies, as in a good many cases it is our experience that the so-called active principle does not give, in all respects, the same action as does the preparation of the drug. We believe that, outside of those drugs whose action results from the presence of a single alkaloid, better average results are secured by giving a tincture or fluid extract than by attempting to give the active principle.”

VEGETABLE DRUGS IN THE U.S.P.

Whatever may be the views of any one concerning the work upon vegetable drugs, not only in the U.S.P., but in the pharmacopœias of any country, it is apparent that there are some statements in definition and description which are too narrow when we look at the drugs practically. The question of origin of drugs is in some cases still obscure, and in other cases greater freedom should be given in the selection of commercial varieties. We mention the following instances:

Myrrh.—Deflers has shown that *Commiphora Myrrh* (Nees), Engl., is without any odor, and that the stems do not yield any resin. Deflers and Schweinfurth consider genuine myrrh to be derived from *Commiphora abyssinica* (Berg.), Engl. A part of the myrrh from Arabia is supposed by Engler to be obtained from *C. Schimperi* (Berg.), Engl. It appears that in commerce the Arabian myrrh from Aden is more highly valued than that of the Somalis. Very recently Mr. and Mrs. Philips have collected plants which are similar to that figured in Bentley and Trimen as the source of myrrh, and what the Somalis gave them to understand yielded myrrh. The whole question therefore resolves itself into one of great uncertainty as to whether only one species yields the myrrh of commerce.

Copaiba.—According to Taubert, a good many American species

of *Copaifera* yield copaiba. The balsam yielded by *C. officinalis*, Jacq. (of Guiana, Colombia and Venezuela), is considered to be the best. Good balsams are also yielded by *C. guyanensis* (Desf.), O. Ktze (Amazon region); *C. multizuga* (Hayne), O. Ktze (Amazon region); *C. confertiflora* (Benth.), O. Ktze (Pianhy); *C. coriacea* (Mart.), O. Ktze (Bahia); *C. Langsdorfii* (Desf.), O. Ktze, and *C. oblongifolia* (Mart.), O. Ktze (both from Rio Janeiro and Minas Geraöe).

Balsam of Tolu.—Besides *Toluifera Balsamum*, L., another plant, *T. peruvifera* (L. fil.), Baill, is also said to yield small quantities of an aromatic balsam resembling that of tolu.

Tamarind.—This fruit is not only yielded by *Tamarindus indica*, L (of tropical Africa), but also by *T. indica*, var. *occidentalis*, Gaertn (of West Indies and Ecuador), the fruit of the latter being more yellowish in color, more mucilaginous and less cohesive in consistency and with less of an acid taste.

Rheum.—It is quite possible that other species besides *Rheum officinale*, Baill, furnish the commercial root. Dammer mentions: *R. australe*, Don. (of the Himalayas), *R. leucorrhiza*, Pall. (of Central Asia), and *R. Rhaiponticum*, L. (of Western China).

Ipecac.—Besides the root of *Cephaelis Ipecacuanha*, Brotero (or Rio Ipecac), there are quantities of another root, viz., Carthagena, which find their way into commerce. From the results of analyses it would appear that the latter is richer in emetic alkaloids than the former. This remains, however, to be proved.

Sarsaparilla—The E. Mexican or Vera Cruz root is yielded by *Smilax medica*, Schlecht. et Cham. The origin, however, of the Jamaica sarsaparilla (given as *S. officinalis*, H. B. K.) and of Para sarsaparilla (given as *S. papyracea*, Duham, of Guiana and Brazil) is not at all certain, but is open to question.

Ammoniac.—Not only does *Dorema Ammoniacum*, Don., yield ammoniac, but also the following species: *D. aucheri*, Boiss. (of Persia), and *D. aureum*, Steks (of Beluchistan). Drude says that African ammoniac is yielded by *Ferula tingitaria*, L. Battandier is authority for the statement that *Ferula communis*, var. *gummifera*, of Algiers and Morocco yields a gum resin which looks much the same as the African ammoniac.

Sumbul.—This root is the product of not only *Ferula Sumbul* (Kffm.), Hook. f., but also of *F. Narthex*, Boiss.

Storax is yielded by *Liquidambar orientalis*, Mill., and by *L. styraciflora*, L.

We find, further, that in looking at the definitions and descriptions of the drugs in the U.S.P. a more liberal interpretation must be given the subject from a practical point of view. Under *Crocus*, for instance, only the stigmas are supposed to be present in the commercial article. The article on the market, even under the most favorable circumstances, does not possess 100 per cent. of stigmas. The amount of foreign material that ought to be allowed in the best commercial specimens must be carefully borne in mind by the practical pharmacist (see AMER. JOUR. PHARM., 1900, p. 123).

Quite a number of cases might be mentioned where, in addition to the drug as specified by the U.S.P., other parts of the plant from which it is derived are generally present, as in *Belladonnæ folia* (includes stems, petioles, flowers and fruits), *Matico* (includes fruits), *Caryophyllus* (includes some stems), etc. In some other cases other plants are present, as in *Chondrus* (a number of algæ). Prof. D. M. R. Culbreth has shown (*Proc. A. Ph. A.*, 1898, p. 765) in a number of vegetable drugs the inferiorities with per cents that are contained in the drugs upon the market, viz., *cimicifuga*, *hydrastis*, *podophyllum*, *geranium*, *senega*, *wild cherry*, *black haw*, *veratrum viride*, *poke root*, *wild ginger*, *angelica* and *sassafras bark*.

There are a number of groups of drugs to which rather stringent definitions, descriptions and limits of admixture may be applied, as in seeds, fruits, roots, barks and flowers. In other cases, the difficulty of giving specific definitions is very clear, as for example in the case of leaves and herbs, rhizomes and plant exudations. To say that certain drugs consist "chiefly" of certain parts covers the ground a little better, *e. g.*, *Crocus*, chiefly of stigmas; *chondrus*, chiefly of *Chondrus crispus*, etc. It would be better, however, if as in the case of *crocus* the percentage of stigmas present in the commercial product were given.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

DIE MIKROSKOPISCHE ANALYSE DER DROGENPULVER. Ein Atlas für Apotheker, Drogisten und Studierende der Pharmacie von Dr. Ludwig Koch, ao. Professor der Botanik an der Universität Heidelberg. Erster Band: Die Rinden und Hölzer. Berlin: Verlag von Gebrüder Borntraeger. Preis, 3 Mk. 50 Pfg.

This is the first German work which may be said to concern itself primarily with the investigation of drugs in a powdered form. The present volume is divided into two parts: (1) A general part, including methods of investigation, and (2) the consideration of the different tissues in barks, with their diagnostic features. The barks considered in detail, and of which excellent plates are given, are Cortex Aurantii Fructus, Cortex Cascariillæ and Cortex Cinchonæ succirubræ. The work will appear in parts and promises to be a valuable one.

SAJOUS ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE. By Charles E. de M. Sajous and 100 associate editors, assisted by corresponding editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings and maps. Vol. IV. Philadelphia: The F. A. Davis Company. 1899.

The present volume contains the last contribution on the subject of "Insanity" by the late Prof. George H. Rohé, of Baltimore. The other important essays contained in the present volume are the articles on "Diarrhœal Diseases of Infants," by Professor Blackader, of Montreal; "Malarial Fevers," by Prof. James C. Wilson and Dr. Thomas G. Ashton; "Diseases of the Liver," by Prof. Alexander McPhedran; "Meningitis," by Dr. Charles M. Hay; "Leprosy," by Dr. Charles E. de M. Sajous. The work is to be regarded like the previous volumes published, as models of their kind.

PROCEEDINGS OF THE PENNSYLVANIA PHARMACEUTICAL ASSOCIATION at its Twenty-second Annual Meeting; held in the College of Pharmacy, Philadelphia, June 13-14, 1899.

A very full account of the proceedings of this Association has already appeared in this JOURNAL (1899, pp. 347-360).

SEVENTEENTH ANNUAL PROCEEDINGS OF THE MARYLAND PHARMACEUTICAL ASSOCIATION, Ocean City, Md., July 11-15, 1899.

The proceedings indicate a very active association in the number and merit of valuable papers as well as in the social features. The following are the subjects of the papers presented: "Lily of the Valley," by A. Schrader; "Artificial Benzoic Acid," by W. C. Powell; "Adulteration of Drugs," by Daniel Base; "Yellow and Green Iodides of Mercury," by J. F. Hancock; "Adulterations of Oils of Savin, Juniper, Sandal and Eucalyptus," by A. R. L. Dohme; "Tablet Triturates," by C. Schmidt; "Glycerin," by

Charles Caspari, Jr.; "Belladonna Plasters," by Charles Caspari, Jr.; "Metric System," by Charles H. Ware; "Synthetic Oil of Wintergreen," by A. R. L. Dohme and H. Engelhardt; "Salicylic Acid in Eye Waters," by Robt. S. McKinney; "Is the Rebate System a Success?" by A. J. Corning; "Belladonna, Digitalis and Henbane Leaves," by A. R. L. Dohme and H. Engelhardt.

PROCEEDINGS OF THE MINNESOTA STATE PHARMACEUTICAL ASSOCIATION at the Fifteenth Annual Meeting, held at Lake Minnetonka, June 20-22, 1899.

The association is well supported, but is deserving of even greater support by the pharmacists of Minnesota. The tone of the proceedings is a good one, although the papers read are by no means numerous. The following are the subjects of the papers presented: "Our Patrons," by W. K. Hicks; "Commercial Education for Pharmacists," by H. Rietzke; "Practical Hints on Pharmacy," by T. Voegeli; "A Continuation of the History of the College of Pharmacy of the University of Minnesota," by F. J. Wulling.

PROCEEDINGS OF THE OHIO STATE PHARMACEUTICAL ASSOCIATION. Twenty-first Annual Meeting, Put-in-Bay, June 22-24, 1899.

The proceedings of this association have already been alluded to in this JOURNAL (1899, p. 406). An excellent likeness of the late Dr. T. L. A. Greve is given, with a short biographical sketch by Prof. J. U. Lloyd.

THE PHILADELPHIA COLLEGE OF PHARMACY.

SEVENTY-NINTH ANNUAL COMMENCEMENT.

The exercises connected with conferring the degrees of Doctor in Pharmacy and Pharmaceutical Chemist were held in the Academy of Music, Wednesday evening, April 18th, at 8 o'clock.

Prayer was offered by Rev. Charles A. Dickey, D.D.

The degrees were conferred by Howard B. French, President of the College.

The following received the degree of Doctor in Pharmacy :

<i>Name.</i>	<i>Subject of Thesis.</i>	<i>State.</i>
Andrews, William Hall,	<i>Toxins, Antitoxins and Serum Therapy,</i>	New Jersey.
Austin, Charles Howard,	<i>Pharmacy,</i>	New Jersey.
Balliet, Howard Paul, P.C.,	<i>Colchicum,</i>	Pennsylvania.
Barker, Laura Alice,	<i>Tinctures,</i>	Pennsylvania.
Bartholomew, Arthur,	<i>Menthol,</i>	Colorado.
Bayles, John Wyckoff,	<i>The Aniline Dyes,</i>	New Jersey.

Name.	Subject of Thesis.	State.
Beatty, Arthur William,	<i>Lippia Mexicana,</i>	Missouri.
Blew, Joseph Oscar,	<i>Acacia and Preparations,</i>	New Jersey.
Brooks, Walter,	<i>Coto Bark,</i>	Pennsylvania.
Burchfield, William Clinton,	<i>Mushrooms,</i>	Pennsylvania.
Carey, Harris May,	<i>Two Official Ointments,</i>	Delaware.
Casperson, Henry Lyle,	<i>Syrup of Wild Cherry,</i>	Delaware.
Connell, Francis Joseph,	<i>Emulsions,</i>	Pennsylvania.
Cook, Ernest Fullerton,	<i>Incompatibility of Alkaloids in Solution,</i>	Pennsylvania.
Corson, Thomas Clark,	<i>The Collection of Drugs for the Pharmacist,</i>	Pennsylvania.
Dentler, Roy W.,	<i>History of Sassafras,</i>	Pennsylvania.
Desch, Edward Allen,	<i>Amylum,</i>	Pennsylvania.
Dietz, Harry Edgar,	<i>Malt,</i>	Pennsylvania.
Dooley, John Joseph,	<i>Iodine,</i>	Pennsylvania.
Dorman, Harry Milton,	<i>Cocillana,</i>	Pennsylvania.
Doughty, John Thompson,	<i>Absorbent Cotton,</i>	New Jersey.
Eddy, Eugene Henry,	<i>Barii Dioxidum and Aqua Hydrogenii Dioxidum,</i>	Ohio.
Edwards, Manly Bruce,	<i>Germination of Seeds,</i>	Pennsylvania.
Eldridge, William Arthur,	<i>Petroleum Products,</i>	New Jersey.
Eshleman, Ellis Good,	<i>Mangani Dioxidum,</i>	Pennsylvania.
Fabian, Asa,	<i>Botany in Pharmacy,</i>	Pennsylvania.
Faunce, George Castor,	<i>Datura Stramonium,</i>	Pennsylvania.
Fisher, John Anthony,	<i>Antitoxin,</i>	Pennsylvania.
Fox, Harry Terry,	<i>Oleum Santali,</i>	Ohio.
Franke, Louis,	<i>Drug Adulterations,</i>	Pennsylvania.
Garritt, Henry James,	<i>Potassii Cyanidum,</i>	Ohio.
Greenberg, Jacob,	<i>A Problem in Chemical Nomenclature,</i>	Russia.
Griest, Joseph Taylor,	<i>The Education of a Pharmacist,</i>	Illinois.
Guest, Wilbert Hillman,	<i>Pharmacy and Bacteriology,</i>	New Jersey.
Hampson, William Harvey,	<i>Rhamnus Purshiana,</i>	Pennsylvania.
Harmony, Edmund F.,	<i>Examination of Chlorinated Lime,</i>	Pennsylvania.
Hauber, Christian Henry,	<i>Hypericum perforatum,</i>	Pennsylvania.
Heckman, John George,	<i>The Pharmacist as an Analyst,</i>	Pennsylvania.
Heinze, George Elmer,	<i>Mydriatic Drugs,</i>	Pennsylvania.
Hemberger, Paul Edward,	<i>Syrupus Ferri Iodidi,</i>	Ohio.
Hilbish, John Henry,	<i>Gelatinum,</i>	Pennsylvania.
Hillebrand, Wm. Gustav,	<i>Rhamnus Purshiana,</i>	Pennsylvania.
Hughes, Harry Wilbert,	<i>Glass,</i>	New Jersey.
Irby, Moreland Russell,	<i>Gossypium Herbaceum,</i>	Virginia.
Jaeger, William Charles,	<i>Commercial Amyl Nitrite,</i>	Pennsylvania.
Kazanjan, Rupen Hagop,	<i>Pharmacy in Armenia,</i>	Armenia.
Kiefer, William Frederick,	<i>History of Vaccine,</i>	Pennsylvania.
Kilgus, Harry Edward,	<i>Panax Quinquefolium,</i>	Pennsylvania.
King, Lloyd Stanley,	<i>Asafetida,</i>	Ohio.
Kincaid, Raymond Keck,	<i>Examination of Glycerin;</i>	Pennsylvania.

Name.	Subject of Thesis.	State.
Kintzer, Harry Augustus,	<i>Aristol,</i>	Pennsylvania.
Landauer, Oscar,	<i>Spiritus Ætheris Nitrosi,</i>	Pennsylvania.
Lehman, Samuel William,	<i>Hydrastis and its Preparations,</i>	Pennsylvania.
Levy, Joseph Jacob,	<i>Acidum Sulphuricum Dilutum,</i>	Pennsylvania.
McCaffrey, Ward Boleyn,	<i>Practice of Pharmacy in the South,</i>	W. Virginia.
McClure, Charles Nevin,	<i>Eriodictyon,</i>	Pennsylvania.
McElwain, Wm. Thomas,	<i>A Sidelight on Pharmacy,</i>	Pennsylvania.
Mackey, Joseph Quarll,	<i>The Relation of the Doctor to the Pharmacist,</i>	Pennsylvania.
Maier, Frank Joseph,	<i>The Doctor and the Druggist in the Country,</i>	New Jersey.
Meredith, Harry Lionel,	<i>The Practical Pharmacy of Coconut Oil,</i>	Maryland.
Merz, Alfred William,	<i>Diphtheria Antitoxin,</i>	Germany.
Michael, George Albert,	<i>Unguentum Aquæ Rosæ,</i>	Pennsylvania.
Moeller, Carl Fred'k Edw.,	<i>Emulsions,</i>	Germany.
Morris, William Torrey, 2d,	<i>Antimonii Sulphuratum et Sulphidum,</i>	New York.
Ohliger, Willard,	<i>Some Experiments in Physiological Assay by the Use of Plants,</i>	Ohio.
Peiffer, Arthur,	<i>Improved Suppository Mould,</i>	Pennsylvania.
Rectenwald, Daniel Lewis,	<i>Artificial Digestion and Artificial Digestive Ferments,</i>	Pennsylvania.
Ricketts, Clarence Emerson,	<i>Odorless Iodoform,</i>	Pennsylvania.
Saurman, James Spang,	<i>Aconite,</i>	Pennsylvania.
Schad, Frank Casper,	<i>Eucalyptus Globulus,</i>	Pennsylvania.
Scott, John Calvin,	<i>Commercial Cold Cream,</i>	Pennsylvania.
Scott, Levi,	<i>Ginseng,</i>	Delaware.
Seabold, H. A. Fahnestock,	<i>Analysis of Hepatica,</i>	Pennsylvania.
Seip, Charles Louis,	<i>The Profession,</i>	Pennsylvania.
Settle, Peter Smith,	<i>Pharmaceutical Ideals,</i>	Pennsylvania.
Shapiro, Henry,	<i>Revolving Capsule Filler,</i>	Russia.
Siegle, Herman Christian,	<i>Syrup of Hypophosphites,</i>	Illinois.
Smith, George Carroll,	<i>Mercury,</i>	Pennsylvania.
Speck, Herbert Arthur,	<i>Requisites of a Druggist,</i>	Pennsylvania.
Stacks, Abraham Homer,	<i>Oleum Ricini,</i>	Pennsylvania.
Stinson, William Samuel,	<i>Belladonna,</i>	Pennsylvania.
Stolz, Louis,	<i>Extraction of Poisons,</i>	New York.
Stone, Edw. Browning, Jr.,	<i>Alkaloids,</i>	New Jersey.
Sullivan, James Francis,	<i>Diphtheria Antitoxin,</i>	Nebraska.
Sunday, Carlton Pierce,	<i>Vaccine Virus,</i>	Pennsylvania.
Taylor, Lynwood S.,	<i>Diphtheria Antitoxin,</i>	Pennsylvania.
Tucker, Robert Woodliffe,	<i>Art of Compressing Tablets,</i>	Bermuda.
Werts, John LaMonte,	<i>Gentiana,</i>	Pennsylvania.
Witman, Charles Daniel,	<i>Quercus Suber,</i>	Pennsylvania.
Witmeyer, Samuel David,	<i>Syrupus Ferri Iodidi,</i>	Pennsylvania.
Young, Alexander, Jr.,	<i>Honey,</i>	Pennsylvania.
Young, Edwin Henry,	<i>Sponges,</i>	Pennsylvania.

The following received the degree of Pharmaceutical Chemist :

Name.	Subject of Thesis.	State.
Bishop, Wm. H. Pancoast,	<i>Medicated Waters,</i>	Pennsylvania.
Hand, Wilson Howe,	<i>The Bettendorf Test for Arsenic in Bismuth,</i>	Oklahoma.
Luebert, August G., P.D.,	<i>Hydrangea Paniculata,</i>	Pennsylvania.
Morgan, Lulu Annette,	<i>Acidum Boricum,</i>	Pennsylvania.
Mutty, Walter C., P.D.,	<i>Terebinthina Canadensis,</i>	New Hampshire.

The degree of Graduate in Pharmacy was conferred upon :

Name.	Subject of Thesis.	State.
McDonnell, Wm. Joseph,	<i>Sinapis Nigra,</i>	Pennsylvania.
Peck, William George,	<i>Volatile Oils,</i>	England.

Special certificates for a two years' course in General, Applied and Analytical Chemistry were awarded to the following :

Eugene Henry Eddy, Wm. Charles Jaeger, Ignatz Suess.

The following States and countries were represented by the Graduating Classes :

Armenia	1	Maryland	1	Oklahoma	1
Bermuda	1	Missouri	1	Pennsylvania	61
Colorado	1	Nebraska	1	Russia	2
Delaware	3	New Hampshire	1	Virginia	2
England	1	New Jersey	10	West Virginia	1
Germany	2	New York	2		—
Illinois	2	Ohio	6		100

Prof. Joseph P. Remington, Dean of the Faculty, announced that the following had attained the grade of Distinguished: Ernest Fullerton Cook and Henry Lionel Meredith; and that the following had attained the grade of Meritorious: Oscar Landauer, Peter Smith Settle and Herman Christian Siegle.

AWARD OF PRIZES.

The Procter Prize of a gold medal and certificate for highest grade of scholarship and meritorious thesis was awarded to Harry Lionel Meredith and presented by Howard B. French.

The William B. Webb Memorial Prize of a gold medal and certificate, offered by Mrs. Rebecca T. Webb, for the highest general average in the branches of committee, operative pharmacy and specimens, was awarded to Ernest Fullerton Cook and presented by Wm. J. Jenks.

Pharmacy.—A prize of a gold medal, offered by Prof. Joseph P. Remington, for an original device or contrivance useful in practical pharmaceutical work, was awarded to Arthur Peiffer, with honorable mention of E. F. Cook and Henry Shapiro.

Chemistry.—A prize of \$25 in gold, offered by Prof. Samuel P. Sadtler, for knowledge of quantitative chemical analysis, was awarded to Wm. T. Morris, with honorable mention of Paul E. Hemberger and Wm. C. Jaeger.

Materia Medica.—A prize of \$25, by Prof. Clement B. Lowe, for the recognition of rare drugs by the aid of the simple microscope only, was awarded to

H. L. Meredith, with honorable mention of C. H. Austin, Louis Franke, Oscar Landauer, F. J. Maier and A. W. Merz.

Pharmacognosy.—A prize of \$25, by Prof. Henry Kraemer, for the best thesis on the pharmacognosy of drugs, was awarded to Willard Ohliger, with honorable mention of Asa Fabian.

The Maisch Prize.—A prize of \$20, offered by Mr. J. H. Redsecker, of Lebanon, Pa., for histological knowledge of drugs, was awarded to Frank J. Maier, with honorable mention of Louis Franke, Oscar Landauer and H. L. Meredith.

Operative Pharmacy.—A prize of \$20 in gold, by Prof. Joseph P. Remington, for the best examination in operative pharmacy, was awarded to E. F. Cook, with honorable mention of Roy W. Dentler, W. F. Kiefer and Levi Scott.

Theoretical Pharmacy.—A prize of a fine Troemner agate prescription balance, offered by Mr. Mahlon N. Kline, of Philadelphia, for the best examination in theory and practice of pharmacy, was awarded to H. L. Meredith, with honorable mention of E. F. Cook, H. C. Siegle, P. S. Settle and L. S. Taylor.

The Robinson Chemical Prize.—A gold medal and certificate, offered by Mr. James S. Robinson, of Memphis, Tenn., for the best examination in general and analytical chemistry, was awarded to Thomas C. Corson, with honorable mention of E. F. Cook, Louis Franke, Paul E. Hemberger and H. L. Meredith.

The valedictory address to the graduating class was delivered by Prof. Henry Kraemer.

COMPLIMENTARY SUPPER.

The professors' farewell supper to the graduates was given on Tuesday evening, April 17th, in the Museum of the College. Many of the officers and trustees of the College were present, as also other invited guests. The supper having been served, the remainder of the evening was devoted to toast-making, Professor Remington, Dean of the Faculty, acting as master of ceremonies.

ALUMNI ASSOCIATION.

The thirty-sixth annual meeting of the Alumni Association was held in Alumni Hall on Monday afternoon, April 16th, with the President, F. W. E. Stedem, in the chair.

Following the annual address of the President, in which a number of recommendations were made relative to the interests of the Association, reports from the Treasurer and Secretary were read. Reports were also received from the several standing committees of the Association.

After the reports had been considered, the election of officers for the ensuing year was held, and resulted as follows:

President, Theodore Campbell; First Vice-President, John H. Hahn; Second Vice-President, Frank G. Ryan; Treasurer, C. Carroll Meyer; Secretary, Wm. E. Krewson; Corresponding Secretary, Wm. G. Nebig; Board of Directors, Jacob M. Baer, M. W. Bamford, C. H. Campbell, Albert Oetinger and L. S. A. Stedem.

The thirty-sixth annual reception of the Association to the seventy-ninth graduating class was tendered on the evening of the same day in the College Museum. The music for the reception was furnished by McKinney's Orchestra.

Introductory remarks having been made by the President, the Secretary called the roll of members elected during 1899-1900. An address to new members was then delivered by President Stedem. The several prizes offered by the Association were presented as follows:

The Alumni gold medal to the member of the graduating class receiving the highest general average was awarded to Harry Lionel Meredith, the presentation being made by the President, F. W. E. Stedem.

The Alumni prize certificates to the members of the class receiving the highest averages in each of the branches were awarded as follows, Dr. A. W. Miller making the presentation: In Pharmacy, to Harry Lionel Meredith; in Chemistry, to Ernest Fullerton Cook; in *Materia Medica*, to Oscar Landauer; in General Pharmacy, to Peter Smith Settle; in Operative Pharmacy, to Ernest Fullerton Cook; in Analytical Chemistry, to Thomas Clark Corson; in Pharmacognosy, to Harry Lionel Meredith.

Alumni Silver Medal was awarded to Edwin Mason Murphy, of Macon, Miss., for the best general average in the second year examination.

Alumni Bronze Medal was awarded to James Clarence Fitch, of Philadelphia, for the best general average in the first year examination.

The class oration was given by E. H. Eddy; the poem by Carlton P. Sunday; the history by H. M. Carey; and the prophecy by C. L. Seip.

EXAMINATION QUESTIONS.

The following is a copy of the questions given to the students of the Third Class at the recent examination. Those in operative pharmacy and analytical chemistry were practical and conducted in the respective laboratories; the others were written.

THEORY AND PRACTICE OF PHARMACY.

A—(1) If 46.657 grammes of Blue Mass be divided into 144 pills, what is the weight of each pill in grains? (2) Give the official name and ingredients, with quantities, of Blue Mass. (3) How would you take the specific gravity of Blue Mass? (4) State under what circumstances it might be desirable to take the specific gravity of Blue Mass. (5) If the administration in a proper dose of old Blue Mass, or improperly kept Mercury with Chalk, should produce nausea, vomiting, pain in the stomach or gastric irritation, what dangerous impurity would you suspect?

B—Give the synonym, unabbreviated official or Latin name, ingredients, brief outline of process and describe the appearance of diluted hydrobromic acid, black draught, blistering collodion, bay rum, Hoffmann's anodyne, glycerin, Goulard's cerate and Basham's mixture.

C—Give the official name, English name, ingredients, brief outline of process and describe the appearance of Liquor Potassii Arsenitis, Tinctura Iodi, Syrupus Pruni Virginianæ, Infusum Digitalis, Pulvis Morphinae Compositus, Pilulae Ferri Carbonatis and Suppositoria Glycerini.

D—(1) Name four liquid alkaloids obtained from official drugs. (2) In what respect do liquid alkaloids differ from solid alkaloids chemically? (3) Name five official preparations from drugs containing liquid alkaloids. (4) Name the alkaloids obtained from Staphisagria. (5) What is the best preparation of

Staphisagria? (6) What is the source of commercial Veratrine? (7) Give the color test for Veratrine. (8) Give the physical test.

E—(1) Name the active constituent of Cantharides. (2) State whether it is soluble in water, alcohol, chloroform, ether, fixed oils, fats. (3) What is its subliming point? (4) What bearing has the solubility of Cantharidin in fats, and its subliming point, in influencing the official direction for making Cantharides Cerate? (5) State the medical properties of Cantharides. (6) Name three official preparations.

F—(1) State what kind of incompatibility is indicated by each of the following prescriptions, and how you would dispense such a prescription :

(1) R Potassi Iodidi ʒ iiss
Hydrarg. Chlor. Cor. gr. vi
Ext. Cinchon. Fld. f ʒ ss
Elix. Aurantii ad f ʒ iv

(2) R Ol. Tereb. f ʒ ij
Tinct. Opii. f ʒ i
Iodini ʒ ss
M. ft. solutio.
Use externally.

(3) R Quin. Sulph. gr. xl
Sodii Salicyl. ʒ iiss
Acid Sulph. Dil. f ʒ ij
Aquaë Fœniculi f ʒ viij
Fiat Solutio.

G—(1) What three classes of suppositories (based upon their method of manufacture) are now recognized? (2) Give briefly the process for making each class. (3) State the method preferred for making each of the following rectal suppositories (15-gr. size): (a) Iodoform, 5 gr., and Carbolic Acid, 1 gr., in each. (b) Glycerin suppositories (official process).

H—(1) What is the object of pharmaceutical legislation? (2) What are the limitations to National jurisdiction in such legislation? (3) What is an "ex post facto" law, and why is such a law unconstitutional? (4) Give the reasons for advocating the payment of all expenses of enforcing Pharmacy laws by the State. (5) Why is it important for each pharmacist to know accurately the "poison laws" of his State, and to strictly obey them?

J—Criticism and translate the following. Write out with English names the ingredients and quantities. State how you would compound them, or what course you would pursue. Give the meaning of the numbers or marks on the margins.

85237

R Plumbi Acetas
Zinci Acetas, āā gr. xv
Cupri Sulph. gr. x
Morphi Acetas gr. iij
Aqua destil f ʒ viij
S.—Use as directed.

R	Phosphori	gr. i
	Benzol Acet.	ʒ ij
	Calcii Chlor.	ʒ iij
	Tr. Zingib.	ʒ ss
	Aquæ, ad	ʒ xij

Misce ft. mist. sec. art.

S.—Capiat ʒ ss bis. vel. ter in die ex cyatho aqua c. spt. vini gallici.

3/21/94

27398

R	Syr. Pruni Virg.	ʒ ij
	Acid Hydrochl.	ʒ ss
	Syr. Scilla	ʒ i
	Tinct. Thebaici	ʒ i

M. S.—Teaspoonful 3 times daily.—S.

St.

81243

K—Criticism and translate the following. Write out with English names the ingredients and quantities. State how you would compound them. Give meaning of numbers and marks on margin.

R	Argent. Oxid	gr. xvi
	Strychnia	gr. i
	Pulv. Capsici	gr. xxiv
	Ext. Gentian	ʒ ij

Box a full m = xxxij.

Sig.—On box the contents of each pill. One after each meal.

60587

o=

D.

R	NaBr	ʒ ij
	KI	ʒ ss
	H ₂ O	ʒ ij

M. Sig.—ʒ i after meals.

R	Acidi Carbolic	f ʒ ij
	Ext. Opii	ʒ ij
	Ol. Olivæ	Oss

Misce bene

□ △ K. 625.

CHEMISTRY.

A—(1) What is the distinction between an "Ether" and an "Ester" in organic chemistry? (2) Mention some of the distinctive chemical reactions of each class. (3) Give official examples of each class.

B—(1) What is an aldehyde, and how does it differ from a ketone? (2) Give an example of each class from both the fatty and the aromatic series. (3) What reactions are common to both classes? (4) By what difference in reactions can they be distinguished?

C—(1) What is meant in organic chemistry by the term "unsaturated acid?" (2) Give an official example of such an acid. (3) By what reagent is their presence recognized in the analysis of fats? (4) What is a "phenol-acid?"

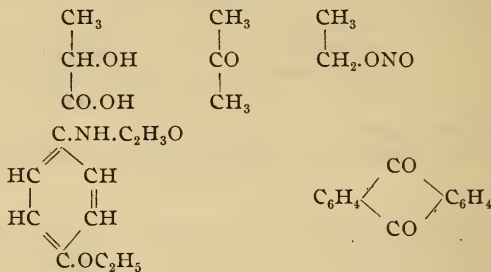
Illustrate by an official example. (5) What is an "alcohol acid?" Illustrate by an official example.

D—(1) To what class of compounds does cellulose belong? (2) By what reactions can its presence in any material be identified? (3) Give the formulas of the compounds resulting from the nitration of cellulose. (4) What are the technical names and uses of these products? (5) What compounds of this latter kind are official?

E—(1) Describe Acidum Benzoicum and write the reaction for its artificial production. (2) Describe Acidum Salicylicum and write the reaction for its artificial production. (3) State the physical and chemical tests by which the two can be distinguished. (4) Show by graphic formulas the relation of these two acids to each other.

F—(1) To what class of compounds does Acidum Gallicum belong? (2) Write the formula of Basic Gallate of Bismuth. (3) Show by formulas the relation of Gallic Acid and Pyrogallol. (4) To what class does this latter compound belong?

G—(1) Write the proper chemical names, and when official, give the pharmacopœial names of the following compounds:



H—Write the graphic formulas of Iodoform, Acetic Ether, Sodium Sulphocarbolate, Acetanilid and B-Naphthol.

I—(1) Give the outline of the systematic examination for poisons by Dragendorff's scheme. (2) State the effect of Phosphorus poisoning, the antidote, and the tests for its detection. (3) State the effects of Arsenic poisoning, the antidote, and the tests of its detection.

K—(1) What are the chief sources of water supply for cities and towns, and what are their relative purity? (2) Mention some of the approved methods for the artificial purification of drinking water. (3) By what means is the natural purification of water effected? (4) State what are important determinations to be made in the sanitary analysis of a drinking water.

MATERIA MEDICA.

A—*Ginger*.—(1) Give the official and botanical names, habitat, natural order and constituents. (2) Name four commercial varieties. (3) What is meant by the terms "coated" and "uncoated" as applied to this drug? (4) What action does the drug have upon the epidermis, the salivary glands, the gastric glands? (5) Name an official fruit derived from the same natural order. (6) What part of the latter is used in Pulvis Aromaticus? (7) Name two preparations of which it is an ingredient.

B—Spores.—(1) State the official and botanical names, natural order, habitat and manner of collection of the spores which are official. (2) What is their shape, color and principal constituent? (3) How must they be treated to obtain the latter? (4) How are they acted upon when thrown upon water, or into a flame? (5) How can an adulteration of starch or pine pollen be detected? (6) What are the uses of this drug in pharmacy and medicine?

C—Ergota.—(1) Give the name of the fungus producing it, and the plant upon which it grows. (2) Describe briefly the three stages of growth of this fungus, and state which of these constitutes the official drug. (3) What are the best ways of keeping it, and how can rancidity be prevented? (4) Name its three most important constituents. (5) Why is this drug used as a hæmodynamic, and what are the effects of its long-continued use when present as an adulteration of flour? (6) What is its action upon unstriated muscular fibre, and upon what organ does it principally act? (7) Why is its indiscriminate sale reprehensible?

D—Cupuliferæ.—(1) Give the official and common names of a bark, an excrescence, a leaf and a volatile oil obtained from plants belonging to this order. (2) Explain briefly the cause of the growth of this excrescence, and state its constituents and medical properties. (3) Does the above-mentioned volatile oil pre-exist in the plant, and with what synthetical chemical is it identical? (4) With what other volatile oil is it nearly identical, and what is the difference between them? (5) State its medical properties.

E—Rhubarb.—(1) Give official name, natural order and habitat. (2) Name the three varieties formerly in commerce, and state which was considered the most valuable. (3) Name its principal organic constituents. (4) What are the points of good quality in Rhubarb? (5) How can you distinguish the official from the European-grown root? (6) State briefly the action of this drug upon the gastro-intestinal tract. (7) What color is imparted by it to the urine and the feces? (8) How is the medical action of the drug modified by torrifying it?

F—Animal Drugs.—Give the official and common names and part used of the drugs derived from the following sources, viz. : (1) *Acipenser Huso*; (2) *Gadus Morrhuæ*; (3) *Physeter macrocephalus*; (4) *Apis mellifica*; (5) *Bos Taurus*; (6) *Sus scrofa*; (7) *Ovis Aries*; (8) *Moschus moschiferus*; (9) *Coccus cacti*; (10) *Gallus Bankiva*.

G—Digestive Ferments.—(1) Name two digestive ferments. (2) The animal, and part of the animal, from which each is derived. (3) The kinds of food upon which they act, and the part of the intestinal tract in which this action takes place. (4) What are the changes which take place in these foods to fit them for absorption? (5) In what doses, and at what times, are they best given? (6) What can be prescribed with each to increase its efficiency?

H—Vanilla.—(1) What is the nature of the plant which produces it, and what is its habitat? (2) Describe its cultivation and preparation for the market. (3) What is the appearance of the ripe, fresh fruit, and what are the characteristics of a good bean? (4) Name three varieties, and state which of these is preferred. (5) Upon what constituent does its aroma depend? Does it exist in the green pod? (6) From what sources can this constituent be artificially prepared? (7) What are the medicinal properties of this fruit?

J—Emergencies.—State briefly what you would do in the following cases if no other medical aid was procurable: (1) Hemorrhage from the radial artery;

- (2) Asphyxia from drowning; (3) Sprain of the ankle; (4) Aconite poisoning; (5) Arsenic poisoning.

K—Emergencies.—Should a case be brought to your store showing the following symptoms, viz.: Deep coma from which the patient could not be aroused, skin cold, face and lips livid, minutely contracted pupils, pulse slow and weak, respiration very slow, reflexes abolished, but no paralysis—what would be your decision as to the nature of the case, and your treatment, if required to act in absence of a physician?

COMMITTEE.

A—(1) How many 250 c.c. bottles will be required to hold a gallon of official Glycerin (no allowance being made for space in bottle, or loss)? (2) At what price per litre would it be necessary to sell official Chloroform, costing \$1.40 per kilogramme, to realize 20 per cent. on the sale? (3) If the price of the following prescription was 50 cents, what would be the proper price for double the quantity if the reduction were at the rate of 25 per cent., and what, if the reduction on four times the quantity were at the rate of 35 per cent.?

Write out the quantity of each ingredient that you would use for four times the original number of pills, expressing these in Apothecaries' Weight and characters:

R	Phenacetine	50 grains
	Salol	48 grains
	Quinine Sulphate	24 grains
	Make into 24 pills.	

*B—*Give a concise description of the physical characteristics of the following, noting color, consistence, taste, odor, etc., of each: Liquor Ferri Tersulphatis, Acidum Stearicum, Tinctura Cardamomi, Syrupus Ferri Iodidi, Liquor Acidi Arsenosi, Ferri et Quininae Citras, Linimentum Calcis, Mistura Ferri Composita, Oleum Sesami and Oleatum Hydrargyri.

C—(1) Give the botanical name, natural order and habitat of the plant from which Copaiba is obtained. (2) Briefly describe Copaiba and the method of production. (3) Give the unabbreviated official names of the preparations into which Copaiba enters, and how is each prepared? (4) Name the acid found in Copaiba. Into what saline combination does it enter in an official preparation? (5) What are the best methods of administering Copaiba? (6) To what constituent of Copaiba is its liquid character due?

D—(1) A pharmacist received the following prescription:

R	Stront. Lact.	ʒij ʒij
	Syr. Aurant.	f ʒ ss
	Aq. q. s. ad	f ʒij
	Mft. Sol.	
	D. S.—f ʒi every three hours.	

As his stock of the first ingredient is exhausted, he decides to make some extemporaneously, having an abundance of Strontium Carbonate C.P. and Lactic Acid (U.S.P.) (or 75 per cent.).

How much of each will be necessary to make the above quantity, and how would you proceed to fill the prescription?

Strontium Lactate has the formula $\text{Sr}(\text{C}_3\text{H}_5\text{O}_3)_2 \cdot 3\text{H}_2\text{O}$.

Use the following atomic weights in your calculation :

$$\text{Sr.} = 87.3; \text{C} = 11.97; \text{O} = 15.96; \text{H} = 1.$$

E—(1) Give Latin name, specific gravity, symbol and valence of Silver. (2) Name some of the localities from which it is obtained. (3) In what combination does Silver usually exist in nature? (4) What process is generally used in separating it from this combination? (5) Name and describe a compound formed by Silver with Oxygen, giving its symbol and formula. (6) What is the most important soluble salt of Silver? (7) Give the official name of, and process for, Mitigated Caustic. (8) Outline the process for Silver Nitrate, and state its usual impurities. (9) Give a test for the compounds of silver. (10) What precaution is necessary in dispensing solutions of Silver Nitrate?

F—If you were consulted by a physician and asked as to the best methods or formulas (pharmaceutically) for giving the following substances to the sick by the mouth, what would you suggest: Oil of Turpentine, Castor Oil, Quinine Sulphate, Salicin, Tincture of Ferric Chloride, Opium, Potassium Iodide, Sodium Salicylate, Strychnine Sulphate and Silver Nitrate.

G—*Pharmacognosy*.—What are the distinguishing features of the leaves of Belladonna, Hyoscyamus and Stramonium: (1) In a crude condition. (2) In a powdered condition. (3) In chemical constituents.

H—Give the official title, botanical name of plant, natural order, habitat and active principles of each of the following drugs: Levant Wormseed, Quaker Button, May Apple, Wild Cherry Bark and Queen's Root.

J—What is a "syrup?" What is "simple" syrup? What is a "medicated" syrup? Name several processes in making syrups, giving the advantages or disadvantages of each process. What precautions are necessary in the use of heat? What kind of sugar is best to use? Why? What causes "vinous fermentation" in syrup? How may syrups be clarified? What is the specific gravity of Syrupus? Name ten (10) official syrups, giving Latin and English names.

K—Critiscise the following prescriptions; state what precautions are necessary in compounding; write out full official name of each ingredient:

(1) R Ext. Stramon. gr. xv
 Liq. Plumbi, S. A. gtt. x
 Acid Tannic gr. viij
 Adeps Lanæ Hyd. ℥ss
 M.—ft. ung. sec. art.

(2) R Bismuth S. Nit. gr. xl
 Sod. Bicarb. gr. xx
 Pepsin gr. xv
 Ft. Pil. No. XX. sec. art.

(3) R Pil. Coerul. gr. xx
 Ext. Henbane gr. x
 Pulv. Cayenne gr. v
 M.—Div. in Pil. No. X.

Sig.—Take two at night, with aperient in the morning.

OPERATIVE PHARMACY.

(1) *Alcoholmetrical Test.*

Estimate the amount of alcohol in the sample of white wine. Put all calculations on the sheet of paper, with your name and examination number, and put on the label the letter of the sample estimated.

(2) *Granulated Salt.*

Acid Salicylic	7'	Grammes
Sodium Carbonate, C.P.	6'5	"
Distilled Water, q. s.		

Make Sodium Salicylate. Put in a wide-mouth bottle.

(3) *Emulsion.*

Make 100 c.c. of an emulsion which shall contain 50 per cent. of Cod Liver Oil, by the English method; place in a bottle and a label on the bottle, giving quantity of each ingredient used.

(4) *Pills.*

Ferrous Sulphate	4'	Grammes.
Potassium Carbonate	2'	"
Sugar, Powdered	1'	Gramme.
Tragacanth	'25	"
Althæa, Powdered	'25	"
Glycerin } of each		
Water }		3 drops.

Make 25 pills; coat with silver.

N. B.—The silver leaf will be found in the pill box.

(5) *Plaster.*

Spread a breast plaster, about 6 inches in diameter. Soap plaster will be found in the dipper.

ANALYTICAL CHEMISTRY.

The examination in Analytical Chemistry included urinalysis and practical examinations of pharmacopœial preparations by volumetric processes, preceded by a written examination on volumetric methods.

SPECIMENS.

The following specimens were placed before each of the members of the class for recognition:

(1) *Pharmacy.*—Adeps Benzoinatus, Aqua Amygdalæ Amaræ, Syrupus, Spiritus Juniperi Compositus, Tinctura Cardamomi Composita, Pulvis Cretæ Compositus, Pulvis Rheii, Acidum Sulphuricum Aromaticum, Tinctura Aurantii Amari, Extractum Cinchonæ Fluidum.

(2) *Chemistry.*—Acidum Aceticum, Sodii Boras, Plumbi Oxidum, Potassii Chloras, Potassii Bitartras, Sodii Salicylas, Amylum, Saccharum, Naphthalinum, Liquor Sodæ Chlorata.

(3) *Pharmacognosy.*—Bryonia, Lappa, Santalum Rubrum, Granatum, Xanthoxylum, Coca, Matico, Anisum, Chenopodium, Guarana.

(4) *Committee*.—Adeps Lanæ Hydrosus, Glycerinum, Spiritus Ætheris Compositus, Tinctura Ferri Chloridi, Acidum Boricum, Alumen, Potassii Ferro-cyanidum, Aconitum, Rhamnus Purshiana, Conium.

MINUTES OF THE PHARMACEUTICAL MEETING.

The stated Pharmaceutical Meeting was held Tuesday, April 17th.

J. H. Redsecker, Ph.M., of Lebanon, Pa., a member of the College and a well-known member of the Pennsylvania Pharmaceutical Association, presided.

The minutes of the previous meeting were allowed to stand as published.

Frederick L. Lewton, of the Philadelphia Museums, was the first speaker and gave a very interesting talk on "The Cultivation and Economics of Agave," which was illustrated with lantern views and specimens of the various products obtained from the plant. The paper will be published in full in a later issue of this JOURNAL.

M. I. Wilbert, Ph.G., read a paper having special value for working pharmacists, which was entitled "A Few Remarks on, and Working Formulas for, the Official and Other Preparations of Soap" (see page 212). In addition to the specimens of the preparations the formulas for which were given, the author exhibited a sample of a 50 per cent. emulsion of crude carbolic acid, which on account of its miscibility has been found useful for making weaker solutions of the acid; and also a sample of a soap liniment in which methyl alcohol was substituted for ethyl alcohol. The latter preparation has not, however, been sufficiently tested to determine its freedom from objectionable properties.

A paper on "An Examination of Acacia," by Robert G. Shoults, P.C., of Sonoma, Cal., was read on behalf of the author by Prof. Henry Kraemer, and will be published in full in a subsequent issue of this JOURNAL.

Mr. Shoults is of the opinion that qualitative tests alone are of very little value for detecting dextrin in powdered acacia, and from his experiments it would seem that the polariscope furnishes a more efficient means for the purpose. The following took part in the discussion of the paper: Dr. C. B. Lowe and Messrs. Lewton and Kebler. Prof. Kraemer referred to a method which he has found readily applicable in determining the purity of powdered acacia (see this JOURNAL, 1899, p. 541).

Lyman F. Kebler read a paper entitled "Suggestions for Revising the Seventh Decennial United States Pharmacopœia" (see page 205).

The paper elicited an interesting discussion, and among those participating in it were: Messrs. Stedem, Redsecker, Boring, Kraemer, Wilbert and the author. During the course of his remarks Mr. Kebler said that, contrary to general reports, he had found the jalap of the market to be of good quality. He had found some samples to assay as high as 15 per cent. and some as low as 1 per cent. Seventeen samples which he assayed averaged over 11 per cent.

Mr. Kebler called attention to some spheroidal crystals of ferric chloride and remarked that the fact of this chemical assuming such a form was a very interesting one. He also exhibited a specimen of crystals of potassium chloride which were slightly conical in form, resembling the calyx of a flower.

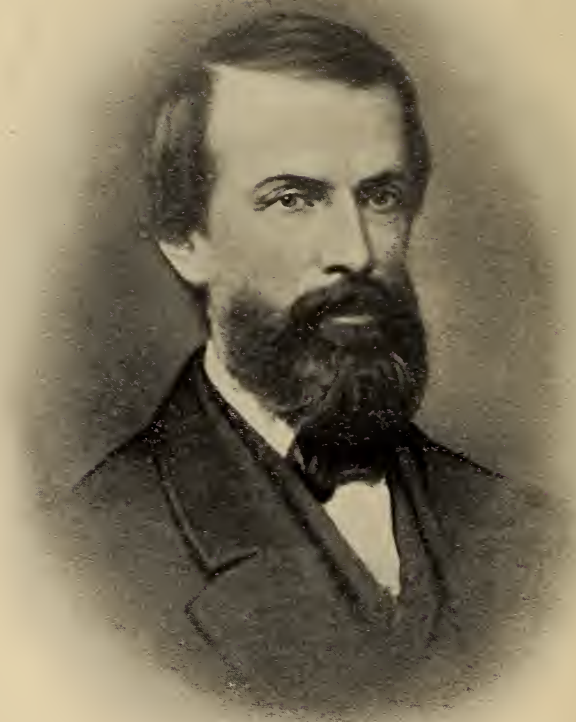
FLORENCE YAPLE,

Secretary pro tem.

CHICAGO COLLEGE OF PHARMACY.

After the annual business meeting and election of officers of the Alumni Association of the Chicago College of Pharmacy, the School of Pharmacy of the University of Illinois, on the evening of March 28th, the fourth of the series of meetings for the discussion of pharmacopœial revision was held. Mr. W. B. Day read a paper on "The Proposed Introduction of Powdered Drugs into the Pharmacopœia." He stated that such introduction would mean simply the appending to the present official description of the entire cellular drugs the microscopical description of the powder. The latter description would involve only a mention or a brief description of the characteristic structural features. Objections that had been made were: greater difficulty in identifying the drug, greater difficulty in determining its quality and purity and increased liability to deterioration. As against these arguments, he urged that instruction in the use of the microscope and in the study of the minute structure of drugs now occupies a prominent place in the curricula of our colleges of pharmacy and that such knowledge is now more widely diffused among pharmacists than ever before; that microscopes of excellent quality can be had at low prices; that the apparatus and skill required for the examination of drugs microscopically are not greater than for the chemical examinations now described in the Pharmacopœia; that suitable containers are more easily provided for powders than for entire drugs; that considerations of convenience and utility have led to the almost exclusive use of powdered or cut as compared with whole drugs, and that inasmuch as drugs are used so largely in the powdered form, it would seem best that they be recognized by the Pharmacopœia in this form, to the end that standards of identity and purity may thereby be established. In this respect, we may well follow the example of the German Pharmacopœia to be issued next year, which will contain descriptions of the more important drugs in the form of powder.

A preliminary report on "The Therapo-pharmacy of the Solid Preparations for Internal Use" was presented by Professor C. S. N. Hallberg. It was stated that the confusion that prevailed relative to the many forms of these preparations had led him to attempt a classification based upon their general therapeutic purposes and comprising the following groups: (1) those affecting the mouth and the respiratory organs, and embracing the troches; (2) those intended for solution or action in the stomach, including the powders and triturations with their modifications as cachets, capsules and tablet triturates, and (3) those intended to act through the intestinal tract, for which purpose the pill is the form best adapted. The drugs comprised in these respective groups were indicated by their therapeutic properties, as antiseptics, astringents, cathartics, diuretics, etc., and these properties would indicate the pharmaceutical form to be adopted in order to secure the desired therapeutic effect. General titles and definitions for the various classes of preparations, together with general formulas for their preparation, were presented. Should these be introduced into the Pharmacopœia, it would not only aid the pharmacist and the prescriber in discriminating between these various preparations, but would have a tendency to check the promiscuous use of tablets by the medical profession.



William Procter

THE AMERICAN JOURNAL OF PHARMACY

JUNE, 1900.

WILLIAM PROCTER, JR.

MEMORIAL READ AT THE AMERICAN PHARMACEUTICAL ASSOCIATION MEETING, MAY, 1900.¹

BY JOSEPH P. REMINGTON.

This distinguished pharmacist was born in the city of Baltimore, May 3, 1817. His parental ancestry can be traced to Thomas Procter, the great-great-grandfather of William Procter, Jr., who was an officer in the army under Oliver Cromwell. The descendants of Thomas Procter became converts to the doctrines of George Fox, and they are early recorded as members of the religious Society of Friends. Isaac Procter, who was the father of William Procter, Jr., and a most exemplary man, was encouraged, through the advice of his friend, Lindley Murray, the grammarian, to emigrate to America, and, after due deliberation, he determined to make America his future home. He arrived on the ship "William Penn," in September, 1793, but, owing to the prevalence of yellow fever in Philadelphia at that time, the ship was not allowed to come up to the

¹The historical information and other facts recorded in this memorial were obtained from the files of the AMERICAN JOURNAL OF PHARMACY, other journals, and from the members of Professor Procter's family. Personal reminiscences also form a part.

[A portrait of Prof. Procter as he was better known, perhaps, to most of the older members of the American Pharmaceutical Association appeared in the Proc. A. Ph. A., 1874, Vol. XXII, and AMERICAN JOURNAL OF PHARMACY, 1874, p. 512. The accompanying frontispiece is taken from the oil painting in the museum of the Philadelphia College of Pharmacy.—EDITOR.]

city. The passengers were landed at Gloucester, N. J., and the ship then proceeded to New York to discharge her cargo. Isaac Procter, with two companions, was compelled to walk to New York, stopping at various Friends' houses on the way. He was fortunately not quarantined, and at last arrived safely in New York, but the fever soon broke out in that city, prostrating business and compelling all who could to leave the city. Isaac Procter, therefore, sought employment in the country. Upon his return to the city later on, some of his friends, of whom he had already won many by his manly conduct and high religious character, advised him to engage in the hardware business in Baltimore. He decided to do so, and opened a store at the corner of Market and Hanover Streets, which he succeeded in making one of the best known of its kind in the country.

On November 3, 1799, he was married at the Meeting House at Fallsington, Pa., to Rebecca Farquhar, whom he had met seven years before while on his way from the vessel in which he had landed to New York. She was a woman of rare moral and religious character, refined and dignified in manner and well fitted for a life companion for such a strong and good man.

William Procter, the subject of this sketch, was their ninth and youngest child. Three years after William's birth, Isaac Procter, the father, died, and it is remarkable that, having escaped death from yellow fever a number of times, he should at last have succumbed to the disease on the 7th of July, 1820. His courage is attested by the fact that he lost his life whilst devoting his time and attention to caring for the suffering during the epidemic of 1820.

After the father's death unexpected claims were made upon the estate, which, although considered by the family unjust, were not resisted, and William Procter was deprived of the liberal education that would have been so enjoyable and advantageous to one of his natural abilities. A companion of his boyhood writes: "We were boys together from six to ten years of age at a Friends' school in Baltimore, taught by a lady of rare gifts and attainments. He was studious, gentle and companionable, and greatly beloved by his teachers and classmates. His powers of observation were very early developed, and, as a child, nothing escaped his notice; he would interest boys in stones that he would pick up in the streets, or in general subjects that would arrest his own mind. Mineralogy

was his especial delight and study at this early age. While other boys would spend their weekly holidays in play, he would start early, with a lunch in his pocket and a steel hammer in his hand, and spend the whole day with a companion in the 'quarries' north of the city, or in the 'deep cuts' of the iron district, or at the 'Bare Hills.' The boys at school were always interested in his specimens, and many a young mineralogist received his taste and first lessons from this young teacher. My mind is full of pleasant and affectionate memories of him, for he was one of the brightest, purest and best boys I ever knew."

In 1831, while on a visit to his friend, Joseph C. Turnpenny, in Philadelphia, he became interested in the drug business and apprenticed himself to Henry M. Zollickoffer, at the corner of Sixth and Pine Streets, where his friend, Joseph C. Turnpenny, was employed. The two friends were soon fairly launched upon their life-work, and it must be remembered that apprenticeship in those days was a very different thing from the clerk hiring of to-day. William Procter, as an apprentice, was faithful, earnest and true, and there is little doubt that his mother's wise counsel and tender sympathies were largely instrumental in laying those most important foundation stones upon which his noble character was built. He endeared himself to his employer by his carefulness, brightness and the alacrity with which he performed all his duties. At the age of 19 he lost his mother, which was a sad blow to him. He records in his diary the following: "I have indeed lost another and only parent, who has watched over me with truly parental care and tenderness. All my hopes of repaying her unceasing kindness are now at an end, and all my dreams of pleasure about the days when I should become a cornerstone to her have vanished forever."

He entered the Philadelphia College of Pharmacy, and his studies were ever marked by an intense earnestness and a determination to make himself proficient. He graduated in March, 1837, his thesis being upon "Lobelia Inflata." He demonstrated the presence of the liquid alkaloid "lobeline," and his research attracted at once much comment. In May, 1840, he was elected a member of the College, and from that time the AMERICAN JOURNAL OF PHARMACY contained many contributions from his pen. During his apprenticeship with Mr. Zollickoffer he found leisure to study carefully a number of chemical works, and he attended special lectures given by Drs. Hare, Mitchell and Bache in the winter of 1840. In 1841

we find him occupying the position of Secretary of the College Committee for the Revision of the United States Pharmacopœia. Later, in February, 1844, he purchased the property at the southwest corner of Lombard and Ninth Streets, Philadelphia, and fitted it up as a drug store. A glimpse of his character may be afforded by the following extract from his diary written at this period: "I am about to leave Sixth and Pine Streets, after so long a residence. What singular events occur! Little did such a prospect appear probable some years ago. Steadiness and calmness of mind, how important to the proper appreciation of life! This I daily become more convinced of, and find cause to note the want of it in my own case. Reflection steadily and calmly directed to moral and intellectual improvement, with all the rigor of justice, and all the affection of mercy, how few can truly govern themselves! I have made little progress in this all-improving power, and have too frequent cause to regret acts of indiscretion and weakness."

On May 12, 1844, his store was opened, and his trials began. He wrote in his diary three months after his store was opened: "It has been a time of singular discomfort to me. The anxiety attending the opening of a new store, and the much time employed has been very burdensome. I need more faith and confidence in the course of events." The neighborhood of Ninth and Lombard Streets would not have presented many attractive prospects to most beginners, particularly to one so well qualified as Mr. Procter for advanced work in pharmacy. The square on the south side of Pine Street, between Eighth and Ninth, was an open lot, and the next street below was the boundary of the city proper, and beyond, many lawless associations were in full force. Steadily and quietly, however, Mr. Procter made his way and "bided his time." He employed his leisure moments in devising new preparations, and, having a great love for individual investigation, there is no question that at this period of his life valuable seed was sown which gave a bent and direction to his future life, from which the profession of pharmacy has derived such lasting benefit. Had he been launched directly upon a thriving and flourishing business career, it is quite possible that Mr. Procter would have closed his life richer in this world's goods, but it is doubtful whether he would have had the leisure to give so much self-sacrificing labor to the interests of his profession, and to the lasting good of his followers. The neighborhood, however, gradually improved, the extension of the city made

the erection of new houses necessary, and slowly but surely the business prospered.

William Procter's professional life-work, apart from his great desire to elevate pharmacy by every means in his power, was chiefly devoted to two objects; first, the upbuilding and development of the AMERICAN JOURNAL OF PHARMACY, and second, the education and training of pharmacists chiefly through his work as professor in the Philadelphia College of Pharmacy. It must not be understood, however, that these two objects alone occupied his energies. The American Pharmaceutical Association, of which he was the founder, the revision of the U. S. Pharmacopœia, which is filled with many contributions from his active pen, and many other interests claimed his attention. A pen picture of William Procter at this time would have shown a young man of medium height, slender, with coal black straight hair, piercing black eyes which were ready in a moment to sparkle with humor, or flash with fire at the thought of injustice done to another; active in movement, solicitous for the welfare of others, modest and retiring in disposition, faithful in his obligations, yet withal, morbidly sensitive to criticism; a charming companion to all who knew him intimately, even playful at times, but such times were always when he was "off duty with his bow unstrung;" but even at this period of his life, a close observer could not fail to realize that here was a man destined to make a mark which would outlast the eroding influences of time. Imbued with the deepest love for his profession, and possessed of buoyant youth, he cast himself with enthusiasm into his pursuits, and fortunately, having a gift of close observation, and above all a sincere love of truth, there remained but the contingency of limited physical powers to offset his career. Fortunately for pharmacy, the latter proved sufficient to sustain him through not what might be called a long life in years, but ample for a long line of achievements.

His journalistic labors began in 1846 when he was associated with Prof. Joseph Carson as co editor of the AMERICAN JOURNAL OF PHARMACY; for two years previously he had assisted Professor Carson in its editorial management. In 1850 Professor Carson resigned his position, and Professor Procter assumed sole editorial charge. In 1853 the JOURNAL was enlarged by the issue of six numbers annually in place of four. In 1871 the issue of the JOURNAL was made monthly. Professor Procter inaugurated the

monthly issue, and after editing the April number resigned his position, and was succeeded by Prof. John M. Maisch. He had contemplated a relinquishment of his editorial duties for some time, and in a written communication to the College some months previously, had advocated a monthly issue of the JOURNAL, and requested to be relieved from the editorship as early as the College could find a suitable successor.

For twenty years the JOURNAL had been under his management in its editorial department, and how successfully that management was conducted the volumes issued during that period are the best testimony. The original matter from his pen, and his judicious selections, gave to it a value and standing among American pharmacists, and made it the most complete history extant of the progress of pharmaceutical science in the United States. As an editor, he was just to all contributors, forbearing in criticism, never indulging in personal or sarcastic comments, ever ready to expose fraud and empiricism, loving truth, and sometimes proclaiming it when it was a disagreeable duty.

After resigning the editorship, his time was so much occupied by his business that his name does not appear as a direct contributor to the JOURNAL; in April, 1871, appeared an article from his pen on "Pharmaceutical Titles," the last of the long series. The General Index of the JOURNAL exhibits seven columns, numbering some 550 items, under his name, exclusive of extracts and editorials. We think it may safely be said without disparagement to any of his predecessors in the editorial management of the JOURNAL, that the College was fortunate in placing the JOURNAL in his hands. No man of the time could have been placed on the outlook commanding the horizon of pharmaceutical literature whose heart was more thoroughly engaged in the work, and who was gifted with quicker perception or better judgment. His name will ever be associated with the progress of pharmacy in the United States, and the twenty volumes of the JOURNAL which bear his name as editor remain a monument to his genius and zeal.

A complete review of the published essays of Professor Procter would occupy too much space for this memoir, and we can only allude to a few of them. His thesis in 1837 on "*Lobelia Inflata*," in which he demonstrates the presence in the plant of an alkaloid, describes the salt formed by union of the principal acids with the alkaloid, and proposes the name of lobelina for the active principle.

Three years previous, S. Calhoun, M.D., Professor of Materia Medica in Jefferson Medical College, Philadelphia, published in the AMERICAN JOURNAL OF PHARMACY, Vol. V, the investigation of an acidified extract from lobelia, which foreshadowed the presence of an alkaloid, but did not succeed in isolating the principle. Professor Procter was aware of Dr. Calhoun's investigation, and refers to it in his supplementary paper, published in 1841—a "casual omission," as he states, in not having done so in his thesis. In November, 1850, Mr. William Bastick read a paper before the Pharmaceutical Society of Great Britain on "Lobelia Inflata." He refers to Dr. Calhoun's paper, but evidently was not aware of Professor Procter's researches in 1837 and 1841. Mr. Bastick isolated the alkaloid and describes it, and his name is associated in the books with its discovery. In January, 1851, Professor Procter writes to the editor of the *Pharmaceutical Journal*, London, as follows: "For some reason, these (my) essays appear to have been entirely overlooked by the press and writers on your side of the Atlantic, and now that the drug is attracting the attention of your medical men, its chemical relations are exciting the curiosity of your pharmacutists. I should not have taken the trouble to bring their existence to your notice, had I not observed the paper of Mr. Bastick in your journal for December, in which he states his ignorance of any previous researches having the same tendency as his own."

The *Pharmaceutical Journal* then published Professor Procter's essay, placing him thirteen years in advance of Mr. Bastick as the discoverer of lobelina.

In the same year with the publication of his thesis, we have "Remarks on an Oil Obtained by Distillation from Wild Cherry Bark, and Evidences of Its Similarity to Oil of Bitter Almonds."

In 1838, a paper "Demonstrating the Existence of Amygdalin in Several Species of the Genera Prunus and Amygdalus."

In 1839, "Observations on Dextrin and Diastase," and "On Lobelia Cardinalis," showing the presence in that plant of an alkaloid differing in some respects from the alkaloid found in *Lobelia inflata*.

In 1840, a paper "On the Power of Saccharine Substances in Protecting from Decomposition Solution of Protiodide of Iron."

In 1841, an essay "Supplementing his Thesis on Lobelia Inflata, and Showing that the Alkaloid Therein Described Represents the Plant in Medicinal Qualities."

In 1842, "Observations on the Volatile Oil of *Gaultheria Procumbens*, Proving it to be a Hydracid Analogous to Salicylous Acid."

A year later, M. August Cahours took up the same subject, and arrived at the same results by a proximate analysis of the oil, but in his paper, published in the *Journal de Pharmacie et de Chimie*, March, 1843, he makes no allusion to Mr. Procter's previous publication, leaving us uncertain whether he had seen Mr. Procter's paper, or whether the investigation made by him was coincident with that of Mr. Procter.

In 1843, "On the Volatile Oil of *Betula Lenta* (Sweet Brier) and on *Gaultherin*," a substance playing a part similar to amygdalin, and which, by its decomposition, yields an oil identical with oil of *gaultheria*.

In 1847, "On the Reduction of Oxide of Iron by Hydrogen."

In 1849, "Remarks on the Oleo-resinous Ethereal Extracts, their Preparation and the Advantages they Offer to the Medical Practitioner."

In 1851, among numerous contributions, we have an essay "On the Botanical and Chemical Character of Sassy Bark (the Doom Plant) of Western Africa."

In 1852, a continuation of the essay on sassy bark, and "Observations on the Volatility and Solubility of Cantharidin, in View of an Eligible Pharmaceutical Treatment of Spanish Flies."

In 1853, fluid extracts began to attract attention, and in this and the succeeding year he contributed several papers on that subject; also, one "On the Pharmacy of the Phosphates."

In 1858, "An Essay on the Hypophosphites."

In 1859, "On Polygalic Acid," and "On the Existence of *Nicotina* in Green Tobacco." In the same year he read before the American Pharmaceutical Association, in Boston, an elaborate essay on fluid extracts, suggesting formulæ for their preparation, and presented specimens of over thirty fluid extracts prepared according to his suggested formula.

For this essay a copy of "Pereira's *Materia Medica*" was voted to him by the Association, as a testimony of its appreciation of his services. This paper may justly be considered as forming the basis on which many fluid extracts were admitted into the *Pharmacopœia*.

In 1866, we have an essay "On *Liquidambar Styraciflua* and its

Balsamic Resin, showing the Principle Contained in the Resin to be Cinnamic Acid.”

William Procter, Jr., became a member of the Philadelphia College of Pharmacy in 1840; in the succeeding year he was elected to the Board of Trustees, and held that position during his life. In 1846 he was elected to the chair of Theory and Practice of Pharmacy, a department which was, in fact, created largely through his instrumentality, and he became the first Professor of Pharmacy in the oldest college of pharmacy in America.

In 1855 he was made Corresponding Secretary of the College, and continued to serve as such for twelve years. In 1867 he was elected First Vice-President of the College. His interest in the affairs of the College continued unabated during the thirty years of his connection with it; so closely was he identified with its progress that its history during that period is almost a narrative of his life.

He served on all committees appointed for the decennial revision of the Pharmacopœia for thirty years, and his services were engaged in assisting Doctors Wood and Bache in several of the last editions of the United States Dispensatory.

In 1872 the Chair of Pharmacy became vacant by occasion of the death of Prof. Edward Parrish. The season for the opening of the course of lectures was so near at hand that the Trustees of the College turned their minds instinctively towards William Procter, Jr., as the man to relieve them from embarrassment. The Trustees were well aware that he had an earnest desire for retirement, and canvassed well the field for one who could, at so short a notice, take up the course on practical pharmacy. At the request of the Board of Trustees of the College, he consented to fill the chair, and delivered the course of lectures in the winter of 1872-73. It was known to his friends that the position was intended by him to be but temporary, and that he contemplated retiring at the close of the following session. The lectures for 1873-74 progressed as far as February 9th, and but a few more remained to finish up the work which he intended should terminate his professorship. On the evening of February 9th he delivered his usual lecture, and on returning home expressed great satisfaction at the attention which the class had given. At a late hour he retired in his apparent usual health; shortly after falling asleep, a disturbance in respiration aroused the attention of members of the family and, before medical assistance could be called, life had ceased.

Twenty-six years have elapsed since Professor Procter passed away. It is true that pharmacy has witnessed many changes in the last quarter of a century, but his work still remains. Methodical and careful in his habits, far-seeing in his vision, equipped by his experience in writing and teaching with the every-day needs of the pharmacist, no wonder need be expressed that time has made so few ravages, and very little of his work can be said now to be obsolete. He lived in what might well be termed the heyday of galenical pharmacy. He witnessed the birth of fluid extracts. Indeed, it is not too much to say that he was the chief nurse of these infants, and while others came after and assisted in the nurture of the children, he was ever faithful, and he lived long enough to see them grow to lusty manhood. If he were but permitted to see the development in this branch of the pharmaceutical art, what satisfaction and comfort it would be!

In 1849 there was issued from the press his American edition of Mohr and Redwood's *Practical Pharmacy*. This voluminous work was enriched by additions from his own pen. The work never went through a second edition, attributed in a great measure to the cost of proper illustration, which the publishers were not willing to incur, and without which the value of the work would have been lost.

In October, 1851, there was assembled in the city of New York a convention of pharmacutists, in pursuance of a call made by the New York College of Pharmacy, for the purpose of considering the law relating to the inspection of drugs at the Custom House, and to fix upon some standard which would enable inspectors to act with uniformity and discernment. The Philadelphia College of Pharmacy was represented by Chas. Ellis, Wm. Procter, Jr., and Alfred B. Taylor. This gathering of men of note, called to discuss the customs law, was impressed with the advantages which would be derived by the pharmacists of the United States from a large association, national in character, where, by personal intercourse and exchange of experience, the practice of pharmacy throughout our widely extended country would be more harmonized, and the general standard of education elevated. It was therefore "resolved that a convention be called, consisting of three delegates from each incorporated and unincorporated pharmaceutical college or society, to meet in Philadelphia on the first Wednesday in October, 1852."

This convention assembled in the old College building, in Zane Street (now Filbert Street), and here was inaugurated the American Pharmaceutical Association, the President of the College, Daniel B. Smith, acting as its first presiding officer. From the time of its inception, William Procter, Jr., enlisted all his activity in promoting its welfare, and his name will be found in all its Proceedings down to the meeting in Richmond, Va., 1873. In 1852 he was a member of its first executive committee; in 1853 was chairman of a committee appointed to prepare an address to the pharmacutists of the United States on the subject of pharmaceutical instruction.

In 1853 he was a member of the committee appointed to prepare a paper on the standard of quality for drugs, together with appropriate tests for detecting adulteration. This committee was continued until the year 1856.

In 1856 he was chairman of the first Committee on the Progress of Pharmacy, all previous reports on this subject having been made by him in his capacity of Corresponding Secretary. In the same year he was appointed chairman of a committee to report a syllabus of a course of study appropriate to students in pharmacy. This committee was continued until the year 1858, when he made the report published in the volume of the Proceedings of the Association of that year. He was Corresponding Secretary from 1852 to 1857, First Vice-President in 1859-60, and was elected President at the session of the Association which convened in Philadelphia in 1862. In 1866 he was appointed one of the delegates to represent the Association at the International Pharmaceutical Congress to assemble in Paris in the following year.

He was absent from the annual meetings of the Association but once (while in Europe), and contributed largely to the interest of its Proceedings by answers to queries which he had accepted, and by his volunteer papers.

The papers contributed by Professor Procter to the American Pharmaceutical Association are numerous, and marked by his usual carefulness and accuracy of investigation. Of these, his essay "On Ergot" (suggesting the use of acetic acid in its preparation), "On Aconite Root," "Atropia from American Belladonna," "On Extract of Cannabis Indica," "On Sassafras Officinale," may be mentioned as not included in the preceding review.

In the Proceedings of the Association for 1873 will be found several able papers from his pen. One, "On Suggestions to Begin-

ners in Pharmacy," should receive attention from all the class who purpose to follow in the path which he has trodden before them.

This sketch would be incomplete without some notice of Professor Procter's home life, and it can readily be surmised that a man with his character and happy disposition would be calculated to make home happy to those who are drawn within the circle of his immediate influence become strongly attached to his personality.

Professor Procter was married twice; first, in October, 1849, to Margaretta, daughter of Amos and Elizabeth Bullock. Two children blessed this union, Wallace, born in 1851, and Mary Goldsmith, in 1852. Wallace Procter followed in his father's footsteps, and now conducts a pharmacy in Philadelphia. He has been a Trustee of the College for a number of years, and is widely respected for his sterling worth, and has given a long service to the interests of the Philadelphia College of Pharmacy.

In 1864 Professor Procter married Catherine, daughter of Robert and Sally Parry. This honored and beloved woman is well known to many of the older members of this Association. She nearly always accompanied her distinguished husband to the meetings of the Association, and her bright face and gentle manners endeared her to all who enjoyed the pleasure of her acquaintance. It would have been a great satisfaction if she could have been here at this meeting. It is just twenty-seven years since Professor Procter attended the last meeting of the American Pharmaceutical Association, held in the city of Richmond in 1873. The loss of her dear husband was, of course, a sad blow to her. In conversation with her a few days ago, she enjoyed with much interest hearing from many of her old friends who still are members of this Association, and I am sure that every member will join in the wish that her future years may be filled with happiness.

In concluding this brief tribute to the memory of William Procter, a few extracts from a eulogy delivered at a meeting of her sorrowing colleagues, students and friends may not be inappropriate:

"How sad for us to think we shall never hear his voice again, that we were not permitted to be with him when he breathed his last, that we could not hear the final message from his lips as the dim future opened before him. No answering pressure of his hand, no parting token of his love; for so sudden was the summons that he stopped not at the river, his feet scarce touched the chill depths of the mysterious stream, when he was fairly over.

“It was not the quiet swinging of the pearl gates as they opened to admit one more among the countless throng, but a sudden flash, and wide open sprang those doors as his spirit passed through.”

Yet, my colleagues, there was mercy in the hand which laid him low; no sharp death agony, no long and painful struggle, and no wasting fever racked his frame; a mere transition! a simple laying down of life and taking up a new.

How appropriate are the words of the famous Carlyle: “The man whom we love lies there, but gloriously worthy; and his spirit yet lives in us with authentic life. Could each here vow to do his little task as the departed did his great one—in the manner of a true man—not for a day, but for eternity; to live as he counseled, not commodiously in the Reputable, the Plausible, the Half; but resolutely in the Whole, the Good, and the True.”

AN EXAMINATION OF ACACIA.

BY ROBERT G. SHOULTS.

In endeavoring to devise some means whereby the presence of dextrin might be established when admixed with powdered acacia, the writer found that the behavior of gum arabic towards the usual reagents so nearly corresponded to the reactions of commercial dextrin that it seems next to impossible to distinguish them by qualitative tests alone. The United States Pharmacopœia ('90) asserts that acacia will not reduce alkaline cupric tartrate V. S. (Fehling's solution), but this is manifestly incorrect, as a study of the appended table will show.

The Pharmacopœia does not state how Fehling's solution is to be used, or, in other words, to what temperature the mixed solutions must be heated in this test.

It would seem that this point were of some importance, as the temperature obtained by the use of a water-bath is not ordinarily sufficient to produce the characteristic red precipitate which the writer has observed at somewhat higher temperatures.

A sample of the commercial powdered gum and also a sample powdered very finely by hand produced a slight reduction at water-bath temperature, but the supernatant solutions, after being filtered and boiled, yielded much heavier precipitates than in the first instance.

Schroeder noticed this peculiar action of the powdered gum, and he attributed it to drying preparatory to powdering. A. J. P., 97, 195

The experiments of the writer go to show that the process of powdering will produce this change in the nature of the gum without the application of artificial heat.

The several samples examined responded to the following glucose tests: the alkaline bismuth, the indigo-carmin, the picric acid and Molisch's thymol test.

The safranin and the phenyl-hydrazin tests were exceptions, as no reaction took place.

It might be of interest to state that the above is corroborated by the experiments of F. W. Haussmann, Ph.G, who found that acacia syrups reduced Fehling's solution and also gave other glucose reactions. (AMER. JOURN. PHARM., 98, 593.)

Following is a table of the treatments of the different samples and the behaviors which were noted.

Samples 1, 2 and 3 were unpowdered gums of different grades of commercial value.

Sample.	Treatment.	Result.
Nos. 1, 2 and 3 . .	{ Heated on a water-bath with Fehling's solution. }	Gave no reduction.
" " . .	Dried at 60° C., afterwards treated as above.	" " "
" " . .	" " 105° C., " " " "	" " "
" " . .	" " 130° C., " " " "	" " "
" " . .	{ " " 130° C., " boiled with Fehling's solution. }	" marked "
" " . .	{ No artificial heat used. Boiled with Fehling's solution. }	" " "
" " . .	{ Heated on a water-bath with Fehling's solution, after treating with HCl. }	" " "
" " . .	{ Heated on a water-bath with Fehling's solution, after treating with KOH. }	" " "
" " . .	{ Boiled with Fehling's solution, after treating with HCl. }	" " "
" " . .	{ Boiled with Fehling's solution, after treating with KOH. }	" " "
Powdered gum (commercial) }	{ Heated on a water-bath with Fehling's solution. }	" slight "
Powdered gum (commercial) }	When filtered and <i>boiled</i> .	" further "
Powdered by hand }	{ Heated on a water-bath with Fehling's solution. }	" slight "
" " }	When filtered and <i>boiled</i> .	" further "

Guichard, in examining the rotatory powers of the various acacias, found that they formed three series according to their specific rotatory powers, as follows: those of Galam and Australia, + 16; those of Arabic and Aden, + 32; while gum Ghatti had a rotatory power of + 64. He explained the difference by viewing the gums as mixtures of several dextro-rotatory and lævo-rotatory substances. (*Chem. and Drug.*, 93, 144.)

Taking this as a suggestion, the writer examined several samples, and according to the results obtained it would seem that this point were worthy of further investigation.

Appended will be found a table showing the behavior of the several solutions towards polarized light.

Sample.	Treatment.	
No. 1	Dextrogyrate.	^a D. 18
" 1	After treatment with HCl, dextrogyrate.	^a D. 34
" 1	" " " KOH, "	^a D. 2
" 2	Previous to treatment, lævogyrate.	^a D. 18
" 2	After treatment with HCl, optically inactive.	—
" 3	Previous to treatment, lævogyrate.	^a D. 18
" 3	After treatment with HCl, optically inactive.	—
Powdered	Previous to treatment, lævogyrate.	^a D. 8
"	After treatment with HCl, dextrogyrate.	^a D. 38

Two samples of commercial dextrin were also examined optically. Sample No. 1 was very white and contained a large percentage of insoluble material, which proved to be starch.

On treating 10 grammes of this sample with sufficient water to make 100 c.c. and filtering, the filtrate was found to have a specific rotatory power of + 102. Sample No. 2 was decidedly yellow and dissolved readily in water. In treating it in the same manner as the foregoing sample it was found to have a specific rotatory power of + 138.

To sum up the results of these experiments, it would seem that qualitative tests alone are of very little value for detecting dextrin in powdered acacia. If dextrin is used for the purpose of adulterating powdered acacia, which I think is highly improbable, the supposition is that a very white sample would be used.

Now, a very white sample of dextrin is liable to contain a large percentage of unconverted starch, which would be insoluble in water, and it could be readily detected by iodine T.S.

A high specific rotatory power for the sample of material and the presence of unconverted starch, left upon treatment with water, would be indicative of the presence of dextrin in the sample of powdered acacia. On the other hand, a sample of dextrin free from insoluble and unconverted starch would be more or less yellow in color. A sample of powdered acacia containing such an admixture would be soluble in water, and while starch might be absent, the presence of dextrin or similar impurities could be inferred from the specific rotatory power, which would be very much higher than that of any pure acacia.

The amount of dextrin or similar impurities detected by the polariscope may be calculated in the following manner:

From the specific rotatory power of the sample examined subtract the specific rotatory power of the pure acacia (*viz.*, 18), and divide the result obtained by the increase in the specific rotatory power made by 1 per cent. of dextrin.

Example.—A given sample of powdered acacia has a specific rotatory power of 126. What is the percentage of dextrin present as detected by the polariscope?

$$126 - 18 = 108; 108 \div 1.8 = 60 \text{ per cent.}$$

The increase in specific rotatory power made by 1 per cent. of dextrin (*viz.*, 1.8) is obtained in the following manner:

$$198 - 18 = 180; 180 \div 100 = 1.8.$$

198 is the specific rotatory power of pure dextrin.

18 is the specific rotatory power of pure acacia.

RUSTING'S TRAGACANTH SCHEME FOR ALKALOIDAL ASSAY WORK.

BY J. B. NAGELVOORT.

In his second edition of "Assay of Drugs," Dr. Lyons speaks admiringly of F. A. Thompson's sawdust "wrinkle," a feature of assaying, appealing to the busy druggist by its simplicity, who wants, nevertheless, to verify the strength of his fluid extracts.

It has been urged for years, and is still true to-day, how disastrous it is to pharmaceutical progress if the druggist is intimidated with elaborated, costly or complicated apparatus. There is no necessity to dwell upon this theme. We all know it.

Thompson's sawdust process for Extr. fluida has the great drawback that the sawdust has to be prepared for it. This pays only if the article is wanted regularly.

Rusting, a young Dutch apothecary of much promise, the kind of man to apply his pharmaceutical experience to chemical manipulations (which in parenthesis promoted the spreading of chemistry in the days of apothecaries like Scheele, Serturmer, Pelletier and Caventou, Trommsdorf, Geiger, Mohr, Merck, Flückiger; public benefactors, like J. C. Bemelot Moens, one who made two blades of grass grow where one used to grow only—in other words, who doubled the output of quinine sulphate, made quinine cheap by his scientific culture of Cinch. Succ. Ledg. on Java, where he was military apothecary at first and later director of the cinchona plantations, not to mention the living, of course), invented a similar scheme, even of wider application, which leaves, as one will see, all the others behind in expediency, cleanliness, cheapness, and is quantitatively very satisfactory. It deserves greatly to be propagated, and, since references are scarcely met in literature, it is offered here for a wider circulation. Only a very small variation is made in the original, which could be dispensed with, where it is applied to the only two Dutch fluid extracts, Ex. fld. Chinæ Succ. and China liquida, the previous one containing only 10 per cent. alcohol, the latter one none at all; but which will make the "Tragacanth" scheme of wider application for the many English and American fluid extracts, with their large percentage of alcohol.

For accurate, expedient and cheap assaying of "drugs," as we usually understand the word, Schwickerath's full report, in the *Pharm. Rundschau* for 1894, page 136, with his use of so-called petrol. ether, instead of ethyl ether, as recommended by Keller, later on, has yet its full value.

The Method.—Weigh in a porcelain or other small dish 3 grammes of the Extr. fluidum, add 5 c.c. of water and expel alcohol. Transfer, in the usual analytical way, into a medicine bottle of about 100 c.c. capacity, add 60 c.c. ethyl ether (pure ether), and make alkaline; add small quantities at a time of a 5 to 10 per cent.

solution of NaOH, verifying alkalinity by litmus paper and avoiding excess of it. Shake the contents of the well-corked bottle strongly for about a minute and add the 2 grammes powdered tragacanth. Shake again for another minute, give the small globules of tragacanth mucilage time to settle, decant off the clear fluid 40 c.c. = 2 grammes of the fluid extract, into an "Erlenmeyer" of known weight, distil ether, add the distilled ether to the common stock, dry the alkaloids, by about 50° C., in a current of air, supplied by a common rubber "spray" ball, to constant weight, which is obtained in about fifteen minutes' time. Multiply by 50, to obtain per cent., and the assay is finished.

Quinine tannate is assayed for its quinine by dividing 1.5 grammes with a little water to a homogeneous mixture, adding 75 c.c. ethyl ether, making carefully alkaline with the given solution of NaOH, shaking first without, and afterwards with 2 grammes powdered tragacanth, decanting 50 c.c. = 1 gramme quinine tannate, treating as above, placing the decimal at two points to the right, for the multiplication to percentage.

For solid narcotic extracts Rusting employed the chloroform-petroleum ether mixture, previously recommended by Schwickerath (*supra*), and titrated as commonly.

Extract Fluid Hydrastis is treated separately by the author. He takes 10 grammes, dilutes with 20 c.c. water, boils slowly in an Erlenmeyer of about 100 c.c. capacity, until a little less than 20 grammes remains, cools off, brings the weight to 20 grammes, shakes with some infusorial earth (kieselguhr), and filters. Ten grammes of the filtrate is transferred (weighed) into a medicine bottle of about 100 c.c. capacity, 25 c.c. pure ether added and later on 3 c.c. ammonia water of 10 per cent., shaken together. Twenty-five c.c. petroleum ether is now added, the whole agitated again; lastly 2 grammes pulverized tragacanth added, shaken anew, allowed to settle and 40 c.c. = 4 grammes fluid extract of the clear fluid taken. This is deprived of its ethyl ether by immersion of the flask containing the 40 c.c. and rotating into water of 30° to 35° C., for a few minutes; ethyl ether will evaporate off hereby; the flask is cooled down, when about two-thirds remains, is well corked, put aside for a few hours in a cool place in winter and into a freezing mixture in the summer time, and the hydrastine left to crystallize out. The supernatant fluid is decanted, the crystals dried and weighed as usual. Results $\times 25 =$ per cent.; quantitatively satisfactory.

RECENT LITERATURE RELATING TO PHARMACY.

PEUCEDANIN AND OREOSELONE.

E. Schmidt reports (*Archiv. d. Pharm.*, 1898, 662) the work of Jasso and Haensel on these substances, found in *Peucedanum officinale*, and the subjects of much investigation and of many conflicting reports. The investigators found the melting-point of the pure peucedanin (the commercial is notoriously impure) was 99° and of oreoselone was 175° – 177° . Analysis showed the formula of peucedanin was $C_{15}H_{14}O_4$ (confirmed by molecular weight estimation), and of oreoselone was $C_{14}H_{12}O_4$. Peucedanin contains a methoxyl group, and, when saponified, oreoselone remains; hence the formulæ of the two may be written $C_{14}H_{11}O_3OCH_3$ and $C_{14}H_{11}O_3OH$, respectively. Both substances, on treatment with bromine, yield the same product—monobromoreoselone, and, likewise, both, on treatment with nitric acid, yield mono-nitroso-oreoselone.

Phenyl hydrazine reacts with oreoselone to form a hydrazone, proving presence of an aldehyde or ketone group. The indications point to a ketone rather than an aldehyde. With peucedanin, a similar reaction occurs, but the hydrazone has not yet been isolated. Acetyl chloride reacts with oreoselone, forming a mono-acetyl derivative. It does not combine with peucedanin, confirming the theory that peucedanin is the methyl ether of the phenol, oreoselone. Several complications presented themselves in the investigation, notably the curious action of ammonia on nitroso-oreoselone, rendering it impossible at present to suggest a more graphic formula than that given above.

The article closes with a brief mention of oxy-peucedanin, a constituent of commercial peucedanin. This melts at 140° , and analyzes to the empiric formula $C_{30}H_{26}O_9$. H. V. A.

DIGITOXIN AND DIGITALIN.

H. Kiliani (*B. d. Deutsch. Chem. Ges.*, 1898, 2454) reports his continued investigations on the above constituents of digitalis.

He finds one molecule of digitoxin ($C_{34}H_{54}O_{11}$) hydrolyzes to one molecule of digitoxigenin ($C_{22}H_{34}O_4$) and two molecules of an interesting sugar—digitoxose ($C_6H_{12}O_4$). The composition of the sugar is proven by the derived oxime and the corresponding acid. He

thinks it a cyclic compound, and notes, as a striking reaction, the blue color produced when it is treated with glacial acetic acid, an iron salt and sulphuric acid. No other observed sugar gives this reaction.

Digitoxigenin forms, with concentrated hydrochloric acid, a characteristic anhydride, which, on oxidation with chromic acid, yields a ketone.

Digitalin ($C_{35}H_{55}O_{14}$) hydrolyzes to digitaligenin ($C_{22}H_{30}O_3$), digitalose ($C_7H_{14}O_5$) and dextrose. Discussing Adrian's statement (*Nouv. Rem.*, 1897, 78) that the French digitalin (Nativelle) is identical with digitoxin, the author finds that, while closely similar, they are not identical.

H. V. A.

EDITORIAL.

THE U. S. PHARMACOPŒIAL CONVENTION.

In another part of this JOURNAL is given a concise account of the salient features of the Proceedings of the National Convention of 1900 for revising the United States Pharmacopœia. There are several features of the Convention which may be gleaned by reading between the lines of the account of the Proceedings which are worthy of mention, at least, at this time. One of these features is the universal appreciation of the services of those who have contributed to the success of the previous editions of the Pharmacopœia. The resolution of appreciation of the eminent services rendered to pharmacy and medicine by Dr. E. R. Squibb was only equalled by the intense pleasure of the members upon hearing the message read by the President that the crisis in the illness of Dr. Charles Rice was passed, and that he would continue as Chairman of the Committee of Revision. These were little things apparently, and yet who will doubt but that they were the greatest encomiums that could be given those whose labors have been characterized by unselfish devotion to the professions of medicine and pharmacy, and whose reward, in a measure, must consist in such expressions from representative bodies of this kind?

Another feature, notwithstanding the nearly uniform representation of the medical and pharmaceutical societies (fifty-seven to fifty-nine) as at the last revision (fifty-four to fifty-four), was the

marked disposition shown to give pharmacists, and particularly those who had served conspicuously in the work of the American Pharmaceutical Association, positions of honor and trust.

The officers of the Convention included five members who are active in the medical profession, and four who are closely allied in pharmaceutical work. All the members of the Board of Trustees are prominent retail pharmacists. The Committee of Revision is represented by six medical men and nineteen pharmacists or teachers in colleges or schools of pharmacy. This emphasizes several things: (1) That however the average pharmacist views the American Pharmaceutical Association, nevertheless the active members of this Association stand for the progress of the mutual work of the medical and pharmaceutical professions; (2) and furthermore that the pharmacists are not losing any ground, but rather growing in the respect of the physician. It must be said, however, that notwithstanding the balance of power in the hands of the pharmacist, there was every disposition shown to make the coming work one of value to the physician as well as to the apothecary.

A third feature, which must be gratifying to the professions, was the rather large distribution of good, sound common sense among the delegates. It did not depend upon any one man to see that the Convention was not imposed upon, or that the Committee of Revision be properly instructed. While it is true that the Convention of 1900 was almost solely guided by the recommendations of the Committee of Revision of 1890, nevertheless, any ill-advised action or one in which there was the least question of advisability was immediately and with little effort defeated. It was pleasing to note the alertness with which the members opposed everything which would detract in any sense from the value of the book which the societies and colleges which had sent them expected them to uphold. Surely, no man who attended the Convention returned home with any other thought than that, come what may, the honor of the Pharmacopœia is safe. Let the experimental or "scouting" party continue their researches. Let the experimenters in pure science bring the fruits of their labors and researches. Let come what may to this or any future Convention or Revision Committee we can expect that good sense and judgment will rule. It now remains for each and all to help the Committee of Revision to make the next Pharmacopœia one in character fitting the first revision of the twentieth century.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

COMMERCIAL ORGANIC ANALYSIS. By Alfred H. Allen. Third Edition. Vol. II, Part II. Hydrocarbons, Petroleum and Coal-tar Products, Asphalts, etc. Revised by Henry Leffmann, M.D. Philadelphia: P. Blakiston's Son & Co. 1900.

Part I of the new edition of Vol. II of Allen's Commercial Organic Analysis, which was noticed in this JOURNAL, 1899, p. 438, covered the fixed oils and fats. This part covers the hydrocarbons and other products from petroleum and coal-tar, and a third part remains to be issued on the essential oils and resins.

The present volume contains much of the greatest interest and value to the chemist and pharmacist. Thus we find both acetylene and calcium carbide treated from the standpoint of our most recent knowledge, with directions for their analysis. Very notable space has been given to asphalts, both European and American, and the best methods for their analysis discussed; the composition of tar from gas retort, shale distillation, coke oven and blast furnace fully discussed and means given for the differentiation of these.

Under phenols we have the newer disinfecting liquids noted, such as creolin, lysol, saprol, solutol and salvéol, and their composition stated.

Under the head of creosote we have the creosotes from different sources compared and means of recognizing adulteration in the more valuable given.

Numerous tabular views of the composition of petroleum, coal-tar and other mixtures are given, and schemes for the analysis of such mixtures.

The book is thoroughly up-to-date in its presentation of the chemistry of this important class of compounds, and can be recommended in the strongest terms as to its value to all working in this field.

S. P. S.

NATIONAL CONVENTION OF 1900 FOR REVISING
THE U. S. PHARMACOPŒIA.

The Eighth Decennial Convention for Revising the United States Pharmacopœia was held in the banquet hall of the Raleigh Hotel, in Washington, D. C., from May 2-4, 1900.

The delegation was a representative one from every part of the Union, Twenty-eight States were represented by delegates from their various pharma-

ceutical and medical societies, and the following national organizations and governmental bodies also sent accredited delegates, viz.: The American Medical Association; the American Pharmaceutical Association, the U. S. Army Medical Department; the U. S. Navy, Bureau of Medicine and Surgery; the U. S. Treasury Department, Marine Hospital Service.

There were fifty-seven medical departments of universities and medical societies and schools represented, as follows: California Academy of Medicine; California State Medical Society; California University; Colorado State Medical Society; Connecticut State University; Columbian University; Georgetown University; Howard University; Medical Society of District of Columbia; National University; Atlanta College of Physicians and Surgeons; Northwestern University (Medical School and Woman's Medical School); Chicago Rush Medical College; Chicago Medical Society; Indiana State Medical Society; Iowa State University; Kentucky State Medical Society; Bowdoin College; Maine Medical Association; Maryland Medical and Surgical Faculty; Baltimore Medical College; Johns Hopkins University; College of Physicians and Surgeons of Baltimore; Massachusetts College of Physicians and Surgeons; Michigan University; Detroit College of Medicine; Minnesota University; Hamline University College of Physicians and Surgeons; Missouri Medical Association; St. Louis Medical Society; Washington University (Missouri); New Jersey Medical Society; New York State Medical Society; New York State Medical Association; Albany Medical College; Long Island College Hospital; Brooklyn Medical Society; Medical Society of King's County, N. Y.; Buffalo University; New York Academy of Medicine; Cornell University; New York Post-Graduate Medical School and Hospital; New York County Medical Association; Cincinnati University; Philadelphia County Medical Society; Pennsylvania College of Physicians; Jefferson Medical College; Medico-Chirurgical College, Philadelphia; University of Pennsylvania; Pennsylvania Woman's Medical College; Western Pennsylvania Medical College; South Carolina Medical Association; Medical College of the State of South Carolina; Vanderbilt University; University of Virginia College of Medicine; Wisconsin State Medical Society.

There were fifty-nine pharmaceutical societies, schools and colleges of pharmacy represented, as follows: Arkansas Association of Pharmacists; California College of Pharmacy; Connecticut Pharmaceutical Association; Delaware Pharmaceutical Association; Howard University; National College of Pharmacy; Georgia State Pharmaceutical Association; Atlanta College of Pharmacy; Illinois Pharmaceutical Association; Northwestern University; Chicago College of Pharmacy; Northern Indiana School of Pharmacy; Indiana Pharmaceutical Association; Purdue University; Iowa Pharmaceutical Association; Kansas Pharmaceutical Association; Kansas University; Kentucky Pharmaceutical Association; Louisville College of Pharmacy; Maryland College of Pharmacy; Maryland Pharmaceutical Association; Massachusetts College of Pharmacy; Massachusetts State Pharmaceutical Association; Michigan State Pharmaceutical Association; Michigan University; Detroit College of Medicine (Pharmaceutical Department); Minnesota State Pharmaceutical Association; Minnesota University; Missouri Pharmaceutical Association; Kansas City College of Pharmacy and Natural Science (Missouri); St. Louis College of Pharmacy; New Jersey College of Pharmacy; New Jersey Pharmaceutical

Association ; New York State Pharmaceutical Association ; Albany College of Pharmacy ; Brooklyn College of Pharmacy ; King's County Pharmaceutical Society ; Buffalo College of Pharmacy ; New York College of Pharmacy ; German Apothecaries of City of New York ; North Carolina Pharmaceutical Association ; Ohio State Pharmaceutical Association ; Ohio State University ; Northern Ohio Druggists Association ; Cincinnati College of Pharmacy ; Cleveland School of Pharmacy ; Scio College ; Pennsylvania Pharmaceutical Association ; Philadelphia College of Pharmacy ; Alumni Association of P.C.P. ; Pittsburg College of Pharmacy ; South Carolina Pharmaceutical Association ; Medical College of State of South Carolina (Department of Pharmacy) ; South Dakota Pharmaceutical Association ; Tennessee State Druggists' Association ; Vanderbilt University ; Virginia Pharmaceutical Association ; Wisconsin Pharmaceutical Association ; Wisconsin University.

It is very interesting to note the uniform representation of the medical and pharmaceutical professions, and the disposition to make the coming Pharmacopœia practicable and useful to both physician and apothecary. The Convention was called to order promptly at 12 o'clock, on May 2, 1900, by the President, Dr. H. C. Wood, who then introduced Hon. John B. Wight, Commissioner of the District of Columbia, who welcomed the delegates in a fitting address to the Capital of the United States. After the reading of the official call by W. S. Thompson, President Wood delivered his address, which we publish nearly in full.

PRESIDENT'S ADDRESS.

BY H. C. WOOD.

"In the thought of the Infinite, it may well be that event follows event in unbroken sequence, from infinity to infinity, but man, bound to time by the limitations of his own existence, for his own purposes arbitrarily breaks the monotony of progress, and calls the larger fragments years, decades, centuries. To-day the tally of the decades is full, and assembled here together we stand upon one of those great mounds which mark the passage of a century. Looking forward, as a traveller who has reached some high dividing summit, we strive to peer into the future, but its mists are impenetrable, and what seem to our straining vision the outlines of figures are but the projected shadows of the present. The view behind is plainer ; the roads by which we have reached the summit are crowded with footsteps, in the nearby sharp and distinct, and fading with the distance. Under such circumstances, it is but natural that the opening address of your President should take a historic tinge, and that before we settle down to work we should try to draw from the past such lessons for the present as shall make secure the future. Such retrospect is especially fitting, since our labors, when they shall be carried to their end, will finish the first century of Pharmacopœia work in the United States.

"It is true that, as told in the historical introduction to the Pharmacopœia, there was published in Philadelphia, in 1778, for military purposes, a small Pharmacopœia, but it was the Counsellors of the Massachusetts Medical Society, who, in 1805, first appreciated the need in America of a general Pharmacopœia, and it was the result of their labors, issued in 1808, that suggested to Dr. Lyman Spalding, of New York City, the formation of the National Standard.

"The dry bones of history, such as may be found in the opening pages of the U. S. Pharmacopœia, interest most of us but little, but when they are clothed with flesh and blood, it quickens heartbeats to see how near akin the men of the past were to the men of the present; and how, notwithstanding all change, the continuing brotherhood of the race reveals itself in the written lines. * * *

"Very far from the truth is Tennyson's antithesis between the permanence of the brook and the momentary life of humanity; the fact is that the stream of mankind flows on forever as much as does the current of the brook; only as the drops of water in the brook change moment by moment, so do the drops come and go in the great human stream; and almost as like as drops are to drops so is man to man. Hands from which had scarcely fallen the gauntlets of Puritanism wrote in primal New England: 'It must not be understood that in adopting the modern language of botany and chemistry we have consulted the whims of every pretender. In this as in former ages men are creating confusion by creating names.' Wise words are these, which the coming sub-committee on nomenclature of the U. S. Pharmacopœia should ponder a little more seriously than have their immediate predecessors. 'In this as in preceding ages men are creating confusion by creating names.' Applicable is this to all sciences, but most applicable is it in the purely natural history studies, so-called, such as zoology and botany. Smith, or Jones, or Thomson, or Cope, written at the end of the name of an animal or plant fails not in its influence on human personality. I well remember with what glee and pride in the days of my callow youth, when I should have been under taskmasters learning methods and facts, I first saw H. C. Wood written after the name of a piece of fossil driftwood from the coal fields of Pennsylvania. The boy is the father of the man. Unconsciously there remains in each of us some capacity of enjoyment such as was in the boy who, pointing to his name in the newspaper, said to his old aunt, 'That's me.' If the personal element could be withdrawn from the specific nomenclature of animals and plants there probably would be much simplification. Let it be said of none of us that we have created confusion by creating names. Why must the poisoned American perish while we are searching our memories for ferri oxidum hydratum cum magnesia when antidotum arsenica might have saved his life, if only he had lived in Germany.

"In the preface of the Pharmacopœia of 1808 it is interesting to find the germs whose subsequent growth has cost the members of this Convention and its committee so much labor. In accordance with the statement in the preface, 'As there frequently arise errors of no small importance from the promiscuous use of weights and measures, it is proper that the quantities of substances, whether fluid or solid, be determined by weight.' In accordance with this the framers of the first American Pharmacopœia adopted the system of parts by weight, but, unfortunately, they went on to say:

"'Yet it may suffice to measure wine, water and aqueous liquids in some instances, provided that for this purpose vessels be employed, of glass where the nature of the substance requires it, whose capacities and divisions accurately correspond with the divisions or multiples of the modern pound.' And so saying our fathers sowed the tares which grew up with the wheat, and choked out the true grain until only by the labor of many years were they uprooted and the system of parts by weight in its purity reinstated in the U. S.

Pharmacopœia. The tares grew rapidly, for in the second edition of the Pharmacopœia, that of 1820, fluid measures were employed. The sin of the men of 1820 in changing from parts by weight to liquid measures of quantity was made greater by the fact that the liquid measures were not at that time in use among the apothecaries of America. That the amblyopia of the Revisers was not deeper than that of their contemporaries is, however, shown by the following extract from a contemporary review of the National Pharmacopœia in July, 1821: 'If the American Pharmacopœia be adopted throughout the United States, as no doubt it will be, these modes of indicating quantities must necessarily come into use, and that they will be continued after having been once introduced we do not hesitate to affirm, because they are more *definite and precise and consequently safer* than the old methods. In such case it will be necessary that the apothecaries be provided with the measures above mentioned.'

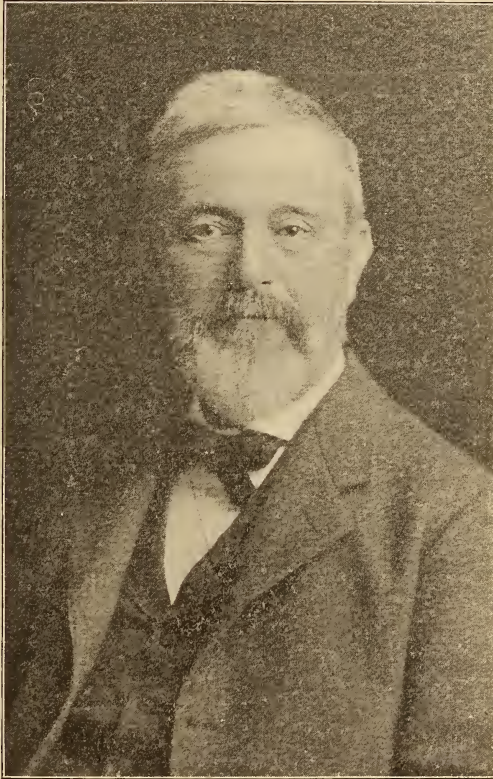
"The language of the Massachusetts Pharmacopœia of 1808 was English. The first United States Pharmacopœia of 1820 was printed in Latin, with a translation of the Latin into English upon the opposite page; and the Convention of 1830, as not departing from the use of Latin, justified itself in the language of the preface because 'the Latin, if not essentially necessary; may prove highly serviceable by fixing the precise meaning of an English phrase which might not otherwise be well understood.' Fancy an American apothecary or an American doctor of the present time, when he could not understand the exact meaning of the English, turning to the Latin to clarify his thoughts.

"The Pharmacopœias of 1820 and 1830 were prepared by the conventions themselves, these conventions being composed solely of physicians. In 1840 the growth in numbers of the convention necessitated the reference of the detailed work of revision to a committee, and the method still in vogue was inaugurated. The same convention made itself further historic by determining that the convention to be called in 1850 should be composed of the two professions of Medicine and of Pharmacy, by whose co-union in labor the continuance of the Pharmacopœia of the United States as an authority has been made possible.

"Since 1840 the great part of the labor of revision of the Pharmacopœia has fallen upon the successive Chairmen of the Committee of Revision. In sixty years of these labors there have been only four chairmen, namely, George B. Wood, from 1840 to 1860; Franklin Bache, from 1860 to 1870; Joseph Carson, from 1870 to 1880; Charles Rice, from 1880 to 1900. As no revision of the Pharmacopœia has been more successful than the last, and as at no time have the necessary duties of the chairman of the committee been as great as they are at present, so never in the century has there been found a man more laborious, more conscientious and painstaking, or better fitted by extraordinary acquirements and personal qualities to fulfil the onerous duties of the position than the present chairman; and your President most earnestly hopes that by his continuance in office the success of the next revision of the Pharmacopœia may be ensured.

"During its whole life the United States Pharmacopœia has received no governmental support, and has been free from governmental control. Under the circumstances the influence which it has exerted upon the pharmaceutical and medical professions, the voluntary obedience which has been given to it,

are not only a tribute to its practical excellence, but also a strong evidence of that peculiar Anglo-Saxon power of recognizing authority that is not upon the statute books, a power born of self-control and common sense, which makes the race, of all others, most capable of self-government. The indirect recognition by the Government of the Pharmacopœia becomes each year more apparent both in Federal and State legislation, so that there does not seem at present any danger of the Pharmacopœia losing its control in the United States.



HORATIO C. WOOD, M.D.¹

“The Pharmacopœias which have been produced in the United States by voluntary effort, both in the past and in the present, contrast favorably with the governmental standards of European countries. In its scientific accuracy, in its general usefulness, and in the efficiency and elegance of its resulting preparations, our Pharmacopœia is the peer of the best.

¹A sketch of Dr. Wood's life is found in Johnson's Universal Cyclopædia and in the *Therapeutic Gazette*, the last volume before the present series.

"I am not one of those who are conceited in things American, freely acknowledging that we have added very little to the great sciences which underlie the practice of medicine, and that we have been indebted to Europe for almost all of our fundamental inspirations, I still hold most strongly, however, to the belief that there are no therapeutics superior to the American therapeutics, and that in no other country has pharmacy been carried to the perfection that it has reached in the United States.

"Delegates of the pharmaceutical associations, I congratulate you on representing a profession which has attained its highest development in the United States.

"There is a probably widespread, and certainly often spoken of, feeling that the medical profession of the United States does not properly appreciate and support the United States Pharmacopœia. There is some foundation for this feeling, but assuredly it is exaggerated. It is true that, owing to the activity of manufacturing pharmacists, and the number and skill of their commercial salesmen (vendors of samples), aided by the deficiencies of medical education and the peculiar childlike credulity which is so common in doctors, all kinds of proprietary mixtures and proprietary articles and extra-pharmacopœial remedies are largely used in the United States. It is so easy for the lazy doctor to write for Smith's Panacea for human ills, and so easy for the doctor who knows neither materia medica nor therapeutics to order Jones' Consumption Cure or Thomas' Kamianita, that so long as laziness and incompetence remain with us so long will this thing be done. But this is no fault of the Pharmacopœia, and no perfection of the Pharmacopœia will greatly influence it. Certainly any attempt to reduce the products of the Pharmacopœia to the level of the proprietary or patent medicine would be to destroy the dignity of the work, to bring it into contempt, and finally to uproot its influence. Under the influence of State law and of public opinion the average education of the American medical profession is rapidly and steadily rising; in this and not in anything that this Convention or its committee can do lies the hope of the future. Moreover, the intensity of the feeling that the American medical profession is not so thoroughly interested in the Pharmacopœia as it ought to be rests largely upon a misconception of the intent of the Pharmacopœia and its relations to the medical profession. A Pharmacopœia is not intended to be a guide to practice, or a working book to be used by the doctor, but is really a handbook of the apothecary. I do not believe that at any time or in any country Pharmacopœias ever have had much sale among the medical profession; and each year, as the professions differentiate themselves more and more, as the doctor becomes less and less of a pharmacist, the tendency of the doctors to buy Pharmacopœias must grow less rather than more. The Pharmacopœia can only be popularized in the medical profession by making it a treatise on therapeutics; in other words, by causing it to cease to be a Pharmacopœia. So long as it is a Pharmacopœia it is the basis upon which text-books and dispensaries are to be written; and it becomes through these treatises a guide to the medical profession. It remains the apothecary's *vade mecum*, with which in hand he does his work, and its sales must be chiefly among the apothecaries.

"There may have been a time when the medical horizon was so narrow that the doctor had time to trouble himself as to how the druggist made laudanum, but at present the doctor has as much as he can do to store his mind with purely

medical facts ; he wants simply to know what laudanum does when he puts it into the patient, and he trusts the apothecary to give him laudanum when he calls for it.

"Be these things as they may, it is certain that the present condition of the United States Pharmacopœia is one of great prosperity. The book itself ranks with the best of its predecessors or of foreign Pharmacopœias, representing all that was possible in 1890. Its hold upon the people of the United States is more firm than it ever was before. Its sales have far exceeded those of any previous edition, and for the first time in the history of this Association the treasury is overflowing. Indeed, so rich have we become that the greatest danger which threatens the Association is, to my thinking, surplus of revenue. * * *

"Finally, gentlemen of this Convention, a word and I have finished. As the American nation of 1800 seems to us to have been but a handful of seed of whose growth we are the fruit, so will those who shall meet here in the year 2000 think of the American people of to-day as a small body from which they have themselves sprung. We live but for the moment ; 100 years from now the greatest of us will remain only as fading memories—as men whose records have been so overwritten on the palimpsest of time that only here and there can a sentence be deciphered. So it ever has been and so it ever shall be with the human race ; men come and go and are not ; but though the worker disappears and is forgotten the work lives on. Our fathers labored and we have entered into their labors. Let us see to it that, preserving in its essential lines that which has come to us, and adding to it in our day and generation as strength is given us, we may leave for the coming century good work and true, which shall remain as the abiding though unrecognized witness of our earnest living."

The President's address also contained a number of recommendations which were subsequently reported upon by a committee consisting of H. M. Whelpley, Joseph P. Remington, S. A. D. Sheppard and J. C. Cleeman. The following is the report which was adopted by the Convention :

"(1) Your committee report that the recommendation to hereafter divide the work of the Committee on Revision and Publication be approved.

"(2) The proposition that the new Committee on Revision consist of twenty members is not approved.

"Your committee believes that in view of the greatly increased demands of the country the number of this committee should be retained at twenty-five.

"(3) The suggestion that the business affairs of this convention during the interim be delegated to a board of five members, together with two officers mentioned, received favorable recommendation.

"(4) We recommend the incorporation of this body and the adoption of the constitution and by-laws at this convention.

"(5) We recommend that the retiring members of the Seventh Revision Committee each receive an honorarium equivalent to \$25 per year for ten years ; the same amount to be tendered to the heirs of deceased members. This cannot be regarded as compensation to the committee, but as a testimony for faithful services performed."

OFFICERS OF THE PHARMACOPŒIAL CONVENTION OF 1900.

On Wednesday afternoon the Committee on Nominations was formed. The committee was made up of one delegate from each of the organizations repre-

sented, and devoted the entire evening to their work of making nominations for (1) Officers of the Convention; (2) The Committee on Revision; (3) The newly-created Board of Trustees.

On Thursday morning the report of the Nominating Committee was read by F. G. Ryan, and the nominees were duly elected by a vote cast by the Secretary. The following is the list of officers of the Pharmacopœial Convention of 1900:

OFFICERS OF THE CONVENTION.—President, Horatio C. Wood, of Philadelphia; Vice-Presidents, A. B. Prescott, of Ann Arbor, Mich.; O. A. Wall, of St. Louis; R. W. Wilcox, of New York; N. S. Davis, Jr., of Chicago, and A. L. Lengfeld, of San Francisco; Secretary, H. M. Whelpley, of St. Louis; Assistant Secretary, W. G. Motter, District of Columbia; Treasurer, William Mew, of Washington, D. C.

COMMITTEE OF REVISION.—Charles Rice, New York; E. H. Squibb, Brooklyn; J. P. Remington, Philadelphia; Charles Caspari, Baltimore; W. G. Gregory, Buffalo; N. S. Davis, Jr., Chicago; James M. Good, St. Louis; George F. Payne, Atlanta; Edward Kremers, Madison, Wis.; S. P. Sadtler, Philadelphia; Henry Kraemer, Philadelphia; H. A. Hare, Philadelphia; L. E. Sayer, Lawrence, Kan.; A. B. Stevens, Ann Arbor; A. B. Lyons, Detroit; C. Lewis Diehl, Louisville; Oscar Oldberg, Chicago; John Marshall, Philadelphia; W. S. Haines, Chicago; J. J. Abel, New York; Virgil Coblentz, New York; W. B. Scoville, Boston; C. S. N. Hallberg, Chicago; A. R. L. Dohme, Baltimore; R. W. Wilcox, New York, and the President of the Convention, *ex-officio*.

BOARD OF TRUSTEES.—A. E. Ebert, Chicago; S. A. D. Sheppard, Boston; William S. Thompson, Washington, D. C.; Charles E. Dohme, Baltimore; George W. Sloan, Indianapolis.

GENERAL PRINCIPLES TO BE FOLLOWED IN REVISING THE PHARMACOPŒIA.

In accordance with the instructions of the Convention of 1890, Joseph P. Remington presented, on behalf of the Committee of Revision, created by that body, a draft of a plan for revising the Pharmacopœia of 1900. This, with some slight modifications, was finally adopted, as herewith presented:

I. SCOPE OF THE PHARMACOPŒIA.

The Committee of Revision is authorized to admit into the Pharmacopœia any product of nature of known origin; also any synthetized product of definite composition which is in common use by the medical profession, the identity, purity or strength of which can be determined. No compound or mixture shall be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patent rights.

2. DOSES.

After each pharmacopœial article (drug, chemical or preparation) which is used or likely to be used internally or hypodermically, the committee is instructed to state the average approximate (but neither a minimum nor a maximum) dose for adults, and, where deemed advisable, also for children, in the metric system, with the approximate equivalent in apothecaries' weights and measures. It is to be distinctly understood that neither this Convention nor the Committee of Revision created by it intends to have these doses regarded

as obligatory on the physician or as forbidding him to exceed them whenever in his judgment this seems advisable. The committee is directed to make a distinct declaration to this effect in some prominent place in the new Pharmacopœia.

3. NOMENCLATURE.

It is recommended that changes in the titles of articles at present official be made only for the purpose of insuring greater accuracy or safety in dispensing. In the case of newly admitted articles, it is recommended that such titles be chosen as are in harmony with general usage and convenient for prescribing; but in the case of chemicals of a definite composition a scientific name should be given at least as a synonym. It is further recommended that every common name and English title of articles used in the present United States Pharmacopœia, whose synonyms, both for the medicinal and commercial drug, be either described or modified so as to leave no doubt as to what is wanted.

4. ASSAY PROCESSES.

The committee is instructed to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple (both as to methods and apparatus required) and lead to fairly uniform results in different hands. As regards the products of such assays, tests of identity and purity should be added wherever feasible. Physiological tests for determining strength should not be introduced by the committee.

5. PURITY AND STRENGTH OF PHARMACOPŒIAL ARTICLES.

The committee is instructed to revise as carefully as possible the limits of purity and strength of the pharmacopœial chemicals and preparations for which limiting tests are given. While no concession should be made towards a diminution of medicinal value, allowance should be made for unavoidable, innocuous impurities or variations due to the particular source or mode of preparation, or to the keeping qualities of the several articles. In the case of natural products the limits of admissible impurities should be placed high enough to exclude any that would not be accepted by other countries.

Regarding the strength of diluted acids, tinctures, and galenical preparations in general, it is recommended that the committee keep in view the desirability of at least a gradual approach upon mutual concessions towards uniformity with similar preparations of other pharmacopœias, particularly in the case of potent remedies which are in general use among civilized nations. It is recommended that every article in the United States Pharmacopœia that has no medicinal value, and is used solely for mechanical and technical purposes, be discarded from the next Pharmacopœia.

6. GENERAL FORMULÆ.

It is recommended that general formulæ be introduced, as far as the particular nature of the several drugs will permit, for fluid extracts, tinctures, and such other preparations as are made by identical processes, and that the general formula to be followed in each case be merely indicated by reference.

7. WEIGHTS AND MEASURES.

The committee is instructed to retain the metric system of weights and measures adopted in the Seventh Decennial Revision.

8. SUPPLEMENT.

It is recommended that the Committee on Revision of the United States Pharmacopœia be directed to issue a supplement to the Pharmacopœia, if they deem such action desirable.

9. PRECEDENTS.

In all matters not specially provided for in these "General Principles" the rules established for previous revision, if there are any, should be followed.

In the course of the discussion in adopting the general principles to be followed by the new Committee of Revision of the U.S.P., a number of things were favorably considered by the Committee, whilst others were objected to. Among the former, which are not already included in the foregoing draft of general principles, was a motion by H. H. Rusby to incorporate among the vegetable drugs such descriptions of the powders as in these cases may be considered desirable by the Committee on Revision. Some of the things voted down by the Convention were: (1) The introduction of serums into the U.S.P.; (2) The substitution of English words wherever possible for foreign botanical terms. The American Chemical Society sent a communication requesting the co-operation of the Convention in the efforts of the various scientific bodies to secure the establishment of a National Standardizing Bureau. This was referred to a committee, and S. P. Sadtler reported at the last meeting that Congress had acted favorably upon the measure since the appointment of the committee, and moved that resolutions commending the action of Congress be passed, which was done. The recommendation of the Medical Society of the State of New York that a Bureau of *Materia Medica* be instituted, in order to carry on disinterested investigation into the character and value of new drugs, was referred to the Committee of Revision.

STATEMENT OF REVISION COMMITTEE.

Owing to the absence of Charles Rice, the Chairman of the Committee of Revision of the U.S. P., Joseph P. Remington asked that the committee of 1890 be permitted to continue its existence as long as necessary to bring its work into final shape, and presented the following statement:

"GENTLEMEN:—It becomes my duty, as Vice-Chairman of the Committee of Revision, in the absence of the chairman, in accordance with a resolution passed by the Committee of Revision, to make to the Convention a statement which will convey information which may be valuable in the absence of the report of the Chairman, Charles Rice, Ph.D., who is most unfortunately prevented from attending this meeting on account of serious illness. This statement must not be regarded as in any way a substitute for the chairman's general report; for the committee sincerely trusts that this will be compiled and go on the records when he shall have sufficiently recovered his health to perform this duty.

"It will be remembered that in the Convention of 1890 authority was given the Committee of Revision to publish the work at its own expense, making contracts for printing, binding and publishing and transacting all of the business connected with the publishing of the work. That this was a wise proceeding on the part of the Convention may be inferred from the fact that the book has received general commendation from all sources; that a larger number have been sold than of any previous revision; that a somewhat larger work

than the previous Pharmacopœia was issued ; that the paper, binding and press-work were better and the book furnished to the public at the price of \$2.50 against the price of \$4.00 for the previous Pharmacopœia.

“ In addition to this, the committee has a balance, as shown by the Treasurer’s report and a certified statement from the trust company in which the funds are deposited, of \$11,861.70. There are still some small bills unpaid, and some receipts yet in possession of the committee, which will leave a net balance in the hands of the committee of about \$12,000. A considerable sum has been expended by the committee for research work, and the results of these researches are available for the next revision of the work and they will greatly facilitate the work of the next committee. This action of the committee will greatly forward the work of the next committee, and we trust that it will enable the latter to issue a more perfect revision in less time than was consumed in preparing the seventh revision.

“ The greater part of the labor of revision was accomplished by means of correspondence, hectographed circulars being used as the means of communication and for voting purposes. This method entailed on the chairman of the committee an immense amount of labor, and the medical and pharmaceutical professions owe a debt of gratitude to our chairman for the masterly manner in which he performed his arduous duties. An expert was employed to collect from all sources detailed criticisms of the work and from these digests were prepared and distributed, which will undoubtedly be of great service to the next Committee of Revision, by furnishing readily accessible data for the improvement of such preparations as have been justly criticised. The authority vested in the committee by the last Convention to employ and pay experts, when necessary, was utilized, it being the sense of the committee that no effort should be spared to make the seventh revision as perfect as possible, and if special knowledge could be secured from any source which would add to the accuracy or completeness of the work, it should be obtained and freely utilized.

“ It will be remembered that at the last Convention in 1890, one of the burning questions, and one which caused possibly the greatest amount of discussion, was the introduction of assay processes to be appended to the descriptions of the more energetic or otherwise improved drugs containing active principles, provided the therapeutic value of the drug depends upon the amount of these principles, and provided also that these principles can be assayed and identified with reasonable accuracy and without requiring complicated processes. The working out of this problem probably caused the committee as much labor and consumed relatively more time than any other special work, and while much remains to be done in this department of the work, it may be safely said that progress is being made, and this Convention will be asked to give the next Committee of Revision similar authority, in order that additional assay processes, which are reliable, may be introduced into the next revision. According to the instructions of the Convention for the seventh revision, no substance which cannot be produced otherwise than under a patented process, or which is protected by proprietary rights, shall be introduced into the Pharmacopœia:

“ Probably no instruction of the Convention has caused more criticism than this ; but it must be remembered that synthetic proprietary remedies were comparatively in their infancy in 1890. But, as is well known, the materia medica has been enriched or cursed with an enormous flood of preparations of this

character, and it will doubtless be necessary for the next committee to make a wise selection of synthetic remedies and introduce them into the next revision.

“Other interesting subjects connected with the seventh revision will be presented to this Convention through the report of the Committee of Revision on General Principles, and it will not be necessary to enlarge further upon the special subjects connected with the revision of the Pharmacopœia. But there are some facts connected with the publication and sale of the book which should be mentioned.

“When the manuscript copy of the seventh revision was nearly ready for the printer’s hands, bids were solicited from various publishing houses for the composition, printing and binding of the book, and also for putting it upon the market. When the bids were opened, it was found that it would be more advantageous to give the contract for making the book to one publishing house and to put the sale of the work in the hands of a distributing book concern. This plan has proved most satisfactory; a system of checks was devised whereby the committee could at any time ascertain exactly how the work of manufacture and sale was progressing. The J. B. Lippincott Company, of Philadelphia, manufactured the book and P. Blakiston’s Son & Co. became the agents for the sale.

“On November 25, 1899, a very destructive fire occurred at J. B. Lippincott Company. The stereotyped plates of the work were deposited in the fire-proof vaults of this establishment. The Sub-committee on Finance deemed it a wise business transaction to specially insure these plates against loss by fire, and for a comparatively trifling sum the insurance was effected. Notwithstanding the fact that nearly all of the plates in the fire-proof vaults were entirely protected when the fire came, it happened through a strange accident that the plates of the Pharmacopœia were entirely destroyed. It may not be out of place to explain how this occurred.

“An overzealous fireman, believing that he could stay the destructive action of the flames by forcing a stream of water on the debris after the walls had fallen, drilled a hole with considerable labor through a brick wall, imagining that he could insert a branch pipe, and thus be of great assistance. He unfortunately broke a hole into the fire-proof vault containing the Pharmacopœia plates. The flames soon drove him away, and sufficient heat entered the vault to melt the plates almost solidly together. As soon as these facts were determined, the sub-committee made application to the insurance company, proved the loss, and after considerable negotiations succeeded in obtaining the entire amount of the insurance money.

“The selling agents, by good business management, were enabled to fill all orders for the book without delay; a contract was executed for reproducing the plates and the book has been continually supplied without loss and is now being sold as usual. The action of the sub-committee saved in this case the sum of \$1,500.

“This statement would be incomplete if reference were not made to the deaths of seven members of the Committee of Revision during the last ten years, as follows: Prof. P. Wendover Bedford, of New York; Prof. Charles O. Curtman, of St. Louis; Dr. John Godfrey, of New York; Dr. John M. Maisch, of Philadelphia; Prof. George F. H. Markoe, of Boston; Alfred B. Taylor, of Philadelphia; Dr. Thomas F. Wood, of Wilmington, N. C.

"The mention of these names will revive recollections of these noble men who passed away in the discharge of their duty. And the absence at this meeting of our devoted chairman will permit the recording at this time of the committee's great appreciation of the scholarly attainments of Dr. Charles Rice, and this slight tribute to his signal ability in carrying the seventh revision of the Pharmacopœia of the United States of America to a most successful conclusion."

REORGANIZATION OF THE CONVENTION.

A distinct feature of the work of the Convention was the adoption of a new Constitution and By-Laws, and the entire reorganization of its work. As now constituted the organization is known as the United States Pharmacopœial Convention. Its object is the revision and publication of the Pharmacopœia of the United States of America.

The Convention shall consist of delegates elected by the following organizations: Incorporated Medical Colleges and Medical Schools connected with incorporated Colleges and Universities, Colleges of Pharmacy and Pharmaceutical Schools connected with incorporated Universities, incorporated State Medical Associations, Incorporated State Pharmaceutical Associations, the American Medical Association, the American Pharmaceutical Association and the American Chemical Society, provided that each organization entitled to representation shall have been incorporated within, and in continuous operation in, the United States for at least five years before the time fixed for the decennial meeting of this Convention.

The Convention shall further consist of delegates appointed by the Surgeon-General of the United States Army, the Surgeon-General of the United States Navy, and the Surgeon-General of the United States Marine Hospital Service, and other organizations represented in the Convention of 1900; each body and each branch of the United States Government above cited shall be entitled to send three delegates to this Convention.

MEMBERS OF THIS CONVENTION shall consist of those delegates whose credentials have been accepted by the Convention, and who have been given seats in the body. Delegates who are not present at the Convention shall not be considered members, but alternates of such absent delegates, if present, may be members. In no case, however, shall any body be represented by more than three delegates. Each member shall be entitled to only one vote in the Convention upon all questions.

THE BOARD OF TRUSTEES shall consist of five delegates, elected by the Convention, together with the President of the Convention and the chairman of the Committee of Revision. Four members shall constitute a quorum. It shall be the duty of the Board of Trustees to permanently invest the funds of the Convention; to execute contracts of agreements for the publication of the Pharmacopœia; to pay experts and others for services performed; to transact all business involving financial matters and to perform such duties as the Convention may from time to time direct.

THE COMMITTEE OF REVISION shall consist of twenty-five members, to be elected by the Convention, together with the President of the Convention, *ex-officio*. Fourteen shall constitute a quorum. Members may send their vote to the chairman of the committee in writing. The committee shall have entire

charge of the preparation of the manuscript and reading proof for the revised Pharmacopœia, and shall, through its chairman, appoint such sub-committees, committees on research and experts as may be required for the proper revision of the work. The Committee of Revision shall elect a chairman, two vice-chairmen and a secretary to serve until their successors are elected. The chairman shall direct the work of revision, receive and announce the votes, attend to the correspondence and prepare the final manuscript of the work. A vacancy occurring in the office of chairman shall be filled by the votes of the committee, a majority of the whole number being necessary to elect. The chairman of the Committee of Revision shall receive such salary for his services as may be determined by the Board of Trustees. He shall appoint all sub-committees, research committees and experts with the advice and consent of the Committee of Revision, and shall present to the Convention a report of the work of the Committee of Revision, and shall hold office until his successor is elected. The Committee of Revision shall receive such nominal compensation for their services as the Board of Trustees shall direct. The members of the Committee of Revision shall be elected for their especial fitness and technical knowledge of the various subjects required for the proper revision of the work, and shall hold office until their successors are appointed. Vacancies in the Committee of Revision may be filled by election by ballot by the Committee of Revision.

The following resolutions were offered by Joseph P. Remington, and adopted by the Convention :

Resolved, That the treasurer of the Committee of Revision of the Pharmacopœia of 1890 be directed to pay over any balance remaining in his hands after the payment of all outstanding debts incurred by the Committee on Revision and Publication of the Pharmacopœia of 1890, and any moneys from any source received hereafter by him, to the treasurer of the U. S. Pharmacopœial Convention.

Resolved, That the treasurer of the Committee of Revision of the Pharmacopœia of 1890 be directed to pay immediately to the treasurer of the U. S. Pharmacopœial Convention the sum of \$1,000, to be held subject to the order of the Board of Trustees, to defray such expenses as may be necessary in carrying on the work of the revision and publication of the Pharmacopœia of 1900.

Resolved, That the Committee of Revision and Publication of the Pharmacopœia of the United States of America for the seventh decennial revision be authorized to direct that their chairman, with their chairman of the Finance Committee and their treasurer, constitute a committee with full power to transact all business relating to the closing of their accounts and the transfer of the balance remaining in the treasurer's hands to the treasurer of the U. S. Pharmacopœial Convention.

Resolved, That the Board of Trustees be directed to print, bind and publish the eighth decennial revision of the Pharmacopœia of the United States of America for the account of the U. S. Pharmacopœial Convention, and to take out a copyright in the name of the Board of Trustees of the U. S. Pharmacopœial Convention.

Resolved, That the Committee of Revision shall print in a conspicuous place in the book a definite date, reasonably distant from the actual date of publica-

tion, announcing when the new Pharmacopœia is intended to go into effect and to supersede the preceding one.

Resolved, That the Committee of Revision is authorized to prepare, and the Board of Trustees is authorized to publish, a supplement to the U. S. Pharmacopœia, if in the opinion of the Committee of Revision and Board of Trustees it be deemed advisable.

Resolved, That the Committee of Revision shall report a complete plan for the revision of the Pharmacopœia at the next decennial convention.

The following resolution, offered by Joseph P. Remington and amended by Charles Caspari, Jr., upon the suggestion of H. H. Rusby, was also adopted :

Resolved, That this Convention direct the Board of Trustees and Committee of Revision to permit the use of the U. S. Pharmacopœia for the purpose of comment by all books and commentaries upon the same terms as granted by the Committee of Revision and Publication of the U. S. Pharmacopœia of 1890.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The forty-eighth annual meeting of the American Pharmaceutical Association was held in the Jefferson Hotel, at Richmond, Va., May 7th to 12th. The first general session convened on Monday, at 3.15 P.M. Soon after calling the session to order, the President, Prof. A. B. Prescott, of Ann Arbor, Mich., introduced Governor Tyler, who made a pleasing address of welcome, and also Mayor Taylor, who extended the privileges of the city. Dr. W. C. Alpers, of New York, having been called upon to respond in behalf of the Association, paid a high tribute to Virginia and to her capital city. Upon invitation, H. P. Hynson, of Baltimore, also returned the thanks of the Association.

Lewis C. Hopp, of Cleveland, O., First Vice-President of the Association, was called to the chair, while President Prescott delivered his annual address. The address was comprehensive in character, and while no radical measures were recommended in it, we believe that every pharmacist who is privileged to read it in its entirety will be prouder of his calling and more reconciled to prevailing conditions as marking but evolutionary steps in a wider growth and greater specialization; and that he will be encouraged to pursue his work with the consciousness that his is an occupation requiring not only special knowledge and special skill, but keen business insight as well, surely a combination of qualifications which must ultimately reflect credit and honor upon those possessing it. After considering the several departments of practice, namely, those of the wholesaler, the manufacturer and the dispenser, the President said: "In the main their interests are in common." Then taking up the subject of teaching, he said:

"With the practitioners of pharmacy in its several divisions of labor belong the teachers of pharmacy and of the sciences applied in its practice. Pharmacy has been sometimes the parent and sometimes the child of chemistry, of botany, of pharmacology. The relation of the apothecary's art to modern science is not estimated at full value. Research came out of pharmacy in the last century and will return thereto in the next. Now, whatever learning may claim for itself, it may claim for its teachers as well. Teachers in college must be in touch with the activities of life. If able to teach or to learn they

must be hand in hand with the things that are taught, as these are worked out in the world; for it is things and not theories that are taught in colleges. Time has passed when a college can continue to live shut in from the breath of life, the field of action. Here is the telephone, the ice-making machine, the coal-tar products—they are not theories, they are facts, and to be taught as such.

“Actual business interest never works against the interest of science in the final test. In the universities at present there are being established broad and unbiased studies of industrial economy and higher commercialism. In our trade associations measures of relief are being put to trial by men of practical vigor. Each set of workers may and will learn from the other, and add to the common stock of advantage.”

In reference to the subject of specialization he said:

“With this view of the extended range of pharmaceutical sciences and the separate branches of pharmaceutical practice, we should be ready to welcome the service of specialists and to provide for their training, all in the fold of pharmacy. As truly as we have retail and wholesale and manufacturing houses, or as different men do different things in a common drug store, so surely must each line of practice employ scientific specialists in its own range of work.

“It is not *every* druggist that is to open an analytical laboratory for the aid of busy physicians and health officers; it is but enough to meet the demand, and a very good beginning has been made in many places. Already bacteriology is an employment, usually with other duty, in a few retail establishments; the call for it is increasing without doubt, and by all means to be cultivated, but I do not think it likely that the majority of graduates in pharmacy will ever be competent bacteriologists. The same may be said of physiological chemistry and of practical pharmacology. The latter is in increasing demand, is extensively required now in manufacturing houses and may become important as an analytical method in valuation. Food and water analyses, as specialties, belong in the profession of pharmacy, of course not exclusively. Advanced pharmacognosy has already been mentioned as a specialty in wholesale work. Analytical chemistry, the earliest of these applications of science, is now well established in a large number of houses—retail, wholesale and manufacturing—and is finding the economical limit of its usefulness, which extends as the standards of the Pharmacopœia are more and more enforced. Next in the advance is the carrying of chemical analysis into organic work and the estimation of potent principles, a science for which pharmacy is mainly responsible and most directly interested. There will be more use of these several sciences in the practice of pharmacy when the sciences make themselves more capable to answer its practical questions.

“The training for these specialties, as it seems to me, can be carried as advanced studies in the colleges of pharmacy in one of two ways, or in both. First, undergraduate time can be found for one advanced study which each student must elect from among several offered. Second, the several advanced studies can be offered to graduate students, some of whom would select one or more of these studies for graduate work in training for special service. The regular studies should not be supplanted by the specialties. In going beyond the regular studies a student gains more by thorough work in one subject than by scattered work in various subjects. Finally, students of insufficient

preparatory education cannot take advanced studies with advantage. And graduates who have shown inaptitude for scientific service may well be advised against undertaking to prepare for it.

“While colleges and universities, in possession of libraries and laboratories and museums and teaching specialists, are the natural centres of specialization and research, these are also highly developed in the larger business establishments, equipped as they may be in the means of investigation. And solitary workers, as well, contribute a great deal to the enlargement of science and the enriching of its literature, personal power overcoming hindrances and making an environment for itself.”

Among other subjects considered in the address were: literature for research, the means for advancement, the work of the several societies and, finally, the increasing of the membership of the Association.

The committee to consider the President's address, which was appointed later on, was as follows: L. C. Hopp, W. S. Thompson and H. P. Hynson.

After the presentation of several reports a recess was taken for the selection of the Committee on Nominations.

The following were appointed by the President as the Committee on Time and Place of the Next Meeting: S. A. D. Sheppard, Wm. C. Alpers, William S. Thompson, Oscar Oldberg and H. M. Whelpley.

SECOND GENERAL SESSION.

The session on Tuesday morning was occupied largely with the reception of reports. The first one presented was that of the Nominating Committee, which was adopted, and the Secretary being instructed to cast a ballot, the following were elected officers for the ensuing year: President, John F. Patton, York, Pa.; First Vice-President, J. H. Beal, Scio, O.; Second Vice-President, J. W. Gayle, Frankfort, Ky.; Third Vice-President, E. A. Ruddiman, Nashville, Tenn.; Treasurer, S. A. D. Sheppard, Boston; Secretary, Chas. Caspari, Jr., Baltimore; Reporter on Progress of Pharmacy, C. Lewis Diehl, Louisville, Ky.; Members of the Council: T. Roberts Baker, Richmond; Lewis C. Hopp, Cleveland; and H. P. Hynson, Baltimore.

By a special order in the proceedings Prof. Jos. P. Remington presented an eloquent memorial address on the life and work of Prof. Wm. Procter, Jr., who, it was stated, attended the Association for the last time when it met in Richmond twenty-seven years ago. (See page 255.) High tribute was paid to the memory of this distinguished teacher and pharmacist, and among others pronouncing eulogies upon him were: John F. Hancock, of Baltimore, who was President of the Richmond meeting (in 1873), Dr. Alpers, Professor Prescott, and A. E. Ebert, the latter of whom moved a vote of thanks to Professor Remington for his preparation of the memorial, which was carried.

Colonel J. B. Purcell, of Richmond, delegate from the National Wholesale Druggists' Association, and F. E. Holliday, of Topeka, Kan., delegate from the National Association of Retail Druggists, were each introduced and given an opportunity to address the Association.

The following committees also reported: National Formulary, Metric Weights and Measures, Auxiliary Committee on Membership and the regular Committee on Membership. In the latter report, the Chairman, Geo. W. Kennedy, of Pennsylvania, stated that the number of active members was

1,155; life members, 108; and honorary members, 13, making a total of 1,276; the number of deaths during the year was 12. The number of applicants reported for membership during the meeting was 123.

THIRD GENERAL SESSION.

The first matter considered at the afternoon session was the report of the Committee on European Tour, which was presented by the Chairman, Caswell A. Mayo, of New York. It was to the effect that arrangements had been perfected whereby any member of the Association, or any person indorsed by the Association, can secure special tickets for \$280.00, providing for a thirty-five days' tour, visiting London, Dover, Ostend, Brussels, Paris, and including all expenses, save luncheon when ashore. These tickets provide for a first-class steamer passage going out on the "Aller" on June 27th, and are good to return on any of the North German Lloyd steamers within a year from the date of issue. Provisions were also made for a number of side trips at some additional expense.

The Treasurer, S. A. D. Sheppard, reported upon the finances of the Association for the nine months ending April 1, 1900, as follows: Expenditures, \$6,540.20; cash on hand, \$784.31, making the total cash \$7,324.51.

A financial report was also made by the Secretary, Chas. Caspari, Jr.

A letter from Dr. E. R. Squibb, of Brooklyn, acknowledging the receipt of the resolution passed at the last annual meeting in commemoration of his eightieth birthday, was read by the Secretary.

Among other reports received at this session was that of the Committee on Time and Place of Meeting. After considerable discussion the Association decided to meet next year in St. Louis, some time during the month of September.

Professor Remington called attention to the lack of interest in the Association by retail pharmacists, and asked that a special committee of five be appointed to consider the welfare of the organization and to report during the meeting a plan for arousing interest in its work. The suggestion was favorably received.

SECTION ON COMMERCIAL INTERESTS.

The work of the sections was next begun and at 4.20 P.M. the Chairman, Prof. J. M. Good, of St. Louis, called the first session of the Section on Commercial Interests to order. The Secretary of the Section, F. W. E. Stedem, of Philadelphia, occupied the chair while Professor Good delivered his annual address. Leaving the patent medicine and cut rate problems to the National Association of Retail Druggists, the speaker thought the following questions ones to which the Association should devote itself: (1) Methods whereby legitimate pharmacy may be made profitable; (2) Methods for interesting physicians in preparations of the Pharmacopœia and the National Formulary; (3) The practice, by physicians, of dispensing their own remedies; (4) Checking the growth of the Free Dispensary Evil; (5) A proper amount of the commercial spirit in the practice of legitimate pharmacy; (6) Buying, selling and care of stock; (7) Methods of advertising; (8) The "Commercial Course" in a College of Pharmacy; (9) The commercial value of a pharmaceutical education.

He said that a National Pure Food and Drug Law is among the possibilities of the future. In considering the question of the Stamp Tax he recommended going slowly in attacking the revenue law.

F. E. Holliday, delegate from the N. A. R. D., was given an opportunity of explaining the work now being carried on by that organization, and his remarks occasioned an animated discussion.

A paper on "Methods of Advertising" was presented by F. W. E. Stedem, after discussion of which the session adjourned.

The work of the Section was resumed on Wednesday morning. The reading of papers being in order, the first one presented was on a "Scheme to Popularize the U.S.P. as the Only Means to Combat Quack Medicines," by Louis Emanuel, of Pittsburg, Pa. This paper was read by the Secretary, as was also the following one on "The Commercial Value of a Pharmaceutical Education," by Joseph Jacobs, of Atlanta, Ga.

Caswell A. Mayo moved that the Section adopt a resolution petitioning Congress to repeal Schedule B of the Revenue Law. The motion carried, and was referred to the general session for final action, with the result that it was adopted.

Prof. F. G. Ryan, of Philadelphia, gave a talk on "A Commercial Training Course in a College of Pharmacy." He said he was impressed with the necessity of commercial training for young men in drug stores, especially those in the smaller stores, where most all of the business is transacted by the proprietor. He said also that this special training could not be obtained in a commercial college. He presented a synopsis of a course which he had taught, and explained some of the features of the work. A hearty vote of thanks was tendered the speaker for his presentation of this subject.

The report of the Committee on Practical Pharmacy and Dispensing was made by its Chairman, H. P. Hynson, of Baltimore. The report embodied a detailed account of the work done by the committee, and the data collected led to some general observations in regard to the compounding of prescriptions which were of much significance.

The report was freely discussed, and that it was a valuable one was confirmed by the action of Council in organizing a new section of the Association on Practical Pharmacy and Dispensing.

A resolution by F. W. E. Stedem, recommending that the Association indorse the N. A. R. D., was adopted by the Section and approved at the final general session.

The following are the officers of the Section selected for the ensuing year: Chairman, Charles A. Rapelye, Hartford, Conn.; Secretary, F. W. Meissner, La Porte, Ind.; Executive Committee, Henry Willis, Quebec; F. E. Holliday, Topeka, Kan., and F. W. E. Stedem, Philadelphia.

SCIENTIFIC SECTION.

The first session of this section was called to order by the Chairman, Prof. F. G. Ryan, at about 3.15 P.M. Wednesday. The first order of business was the reading of the Chairman's address, the Secretary, C. A. Mayo, occupying the chair while it was being presented. After reviewing the scientific achievements of the Association during the period of its existence, the speaker took up the subject of specialization. He said:

"Formerly the scientific work of this Association was very largely contributed by men actually engaged in the practice of pharmacy; now we may note that, like all other occupations, specialism is the order of the day. Our investigations are made by those best qualified for a particular kind of work. We have our chemists, botanists and pharmacists, and these again subdivided, and each giving his attention and study to some particular branch of his chosen science, but it is the exception rather than the rule that we find the investigator still wielding the mortar and pestle.

"As in other occupations and professions, is not the division of labor which characterizes the present time a necessity in pharmacy, if healthy and progressive advancement is to be made?

"In his address one year ago before this section, Dr. H. H. Rusby voiced the sentiments of this Association in an appeal for investigations in pure science. The present Chairman echoes the same sentiments, but does not believe this should be the work of the retail pharmacist; his education should be so directed as to fit him for the practical application of the scientific truths brought to light by original investigators, leaving original investigation to those whose natural inclinations, ability and education fit them for advanced scientific research."

He then considered some of the subjects which are coming up for investigation, as follows:

"With a view of extending the usefulness of our Association, your Chairman would call your attention to a few subjects which, in his opinion, seem to offer fertile fields for investigation by our members. A recent paper by Mr. F. B. Kilmer, on the cultivation of medicinal plants, shows that but little attention has been given to this subject in our own country. With a knowledge of the progress made in the cultivation of cinchona and some other medicinal drugs, is it not probable that equal success may be attained with many of our indigenous plants? As our knowledge of the active plant constituents becomes more exact, it would seem quite within our power to control to a certain extent the production of such constituents in the growing plants. These investigations should become a part of the work of our Government in its Department of Agriculture. Indeed, we believe this subject of sufficient importance to this Association to warrant the appointment of a committee for the purpose of securing such investigations by the proper government officials at Washington.

"With our Pharmacopœia rapidly becoming the legal standard for the purity and strength of official substances in the various States, our manufacturing chemists and pharmacists can greatly aid in establishing such standards as will be within the range of possibility in commercial manufacturing, and, at the same time, protect the public health. With the strict enforcement of our food and drug laws many annoying prosecutions may occur, and persons entirely innocent of intentional wrongdoing be made to suffer.

"With the rapid growth and extended use of modern synthetic remedies, the employment of serum therapy and antitoxins in medicine, it seems desirable that pharmacists should have a greater knowledge of the physiological action of drugs, upon which the manufacture and use of these compounds so largely depends. Papers upon this subject would prove of interest to this section.

"In his address as President of the British Pharmaceutical Conference last year, Mr. J. C. C. Payne, quoting the eminent scientist, Professor Huxley,

states that the latter declared "that he would abolish materia medica from the medical curriculum, and cannot understand the arguments for obliging a medical man to know all about drugs and where they come from." Evidence is not wanting that many of the physicians of our own country hold the same opinion. In the light of these facts there need be no fear for scientific pharmacy, and this Association will supply willing and able workers, as it has in the past, to meet the emergencies as they may arise."

The address was referred to a committee consisting of Messrs. F. E. Stewart, J. M. Good and A. B. Stevens.

The Secretary of the Association, Chas. Caspari, Jr., announced that the Committee on the Ebert Prize recommended the award of the prize to Edward Kremers and Oswald Schreiner for their paper presented at the meeting last year on "Nitroso Derivatives of Caryophyllene and Cadinene and their Bearing on the Characterization of the Sesquiterpenes."

The papers of this section were for the most part presented in groups, discussion being deferred until all the papers of a group were read.

APPLICATION OF THE MODIFIED ALKALIMETRIC METHOD TO THE ASSAY OF DRUGS AND GALENICALS.

BY H. M. GORDIN.

The drugs to which the method was applied were opium, nux vomica and cinchona, and the galenicals were the fluid extracts of nux vomica, hydrastis and cinchona. The results obtained showed the method to be quite satisfactory.

SHORT DIRECTIONS FOR THE ASSAY OF OPIUM.

BY H. M. GORDIN AND A. B. PRESCOTT.

According to a statement by the authors, this method is a modification of one proposed by them last year, with the exception that they now titrate by standard acid after removal of the alkaloid, and employ hot extraction with chloroform alone.

ALKALOIDS OF BOCCONIA CORDATA.

BY PAUL MURRILL AND J. O. SCHLOTTERBECK.

The plant is a native of Japan, and belongs to the Papaveraceæ. It has been introduced into the United States, and is commonly known as Tree Celandine. All the parts of the plant examined by the authors contained alkaloids, these being present in largest amount in the rhizome. Three distinct alkaloids were isolated and subjected to combustion analysis. These were Protopine ($C_{20}H_{19}NO_5$), β -Homochelidonine ($C_{21}H_{21}NO_5$) and Chelerythrine ($C_{21}H_{17}NO_4 + C_2H_5OH$). Sanguinarine has been reported as present in the plant, but the authors have not been able to identify the free alkaloid.

EXTRACTION AND ESTIMATION OF COLCHICINE.

BY H. M. GORDIN AND A. B. PRESCOTT.

After having tried a number of solvents, the authors found that extraction of the drug with hot alcohol for two hours completely removed the colchicine. The estimation of this principle was easily accomplished by saponification

with standard alkali and titration with standard acid, phenolphthalein being used as indicator. This method of estimation is based on the fact that colchicine is an ethereal salt rather than an alkaloid.

ALKALOIDS OF CEANOTHUS AMERICANUS.

BY H. M. GORDIN.

About $\frac{1}{2}$ per cent. of an alkaloidal substance was obtained from this plant which is a mixture of ether-soluble and ether-insoluble constituents. The substance is not crystalline and none of its compounds are precipitable. Nitrogen is present and the question as to whether the substance is an alkaloid or a mixture of alkaloids remains to be settled.

SUGGESTIONS RELATIVE TO THE PROPOSED INTRODUCTION OF POWDERED DRUGS INTO THE U.S.P.

BY A. SCHNEIDER.

Among the subjects considered in this paper were: Selection of drugs, precautions in regard to heating, atmospheric conditions, methods of powdering and sifting, methods of preserving, general characteristics, histological structure, etc., etc.

COLOR STANDARDS FOR THE VEGETABLE DRUGS OF THE U.S.P.

BY HENRY KRAEMER AND HERBERT J. WATSON.

This paper was a continuation of the one published in the Proceedings of the A. Ph. A. last year. The crude drugs were arranged according to the standards already given and then followed an alphabetical arrangement of the vegetable drugs, together with their colors, external and internal, in a crude state and in a powdered condition.

NOTES ON THE EXAMINATION OF JALAP ROOT DURING THE PAST SIX YEARS.

BY LYMAN F. KEBLER.

It was shown by statistics that jalap root grown under favorable conditions contained much more resin than 12 per cent., the 1890 Pharmacopœia standard. Investigators of late years, however, have placed themselves on record to the effect that this standard is too high.

The writer of this article obtained results which indicate that while it is not desirable to place the standard as high as 12 per cent., he does not agree with the general opinion that it should be as low as 8 per cent. 10 per cent. should probably be the lowest.

The large number of samples examined varied from 17 per cent. in 1894 to 187 per cent. in 1899. It seemed that the jalap root supplied continued to diminish constantly in per cent. of resin from the time of advent of the 1890 Pharmacopœia. Jalap root of 12 per cent. could be secured until the past few years.

THE PHARMACOLOGIC ASSAY OF DRUGS.

BY E. M. HOUGHTON.

In discussing the theory of the pharmacologic assay of drugs, the author claimed that the action of drugs should be regarded as quantitative rather than qualitative. He said that a number of constituents have the same qualitative

action but are different in quantitative effect. Some of the general rules to be observed in this method of assay were given, and the observation made that antitoxins may likewise be assayed in this manner.

PHYSIOLOGICAL *vs.* CHEMICAL, AND MICROSCOPICAL EXAMINATION OF DRUGS.

BY LYMAN F. KEBLER.

The writer reported the results of two examinations, which appear to show conclusively that the physiological indications ought to be considered in the standardization of drugs.

The first was a fluid extract of castor-oil leaves, which exhibited symptoms of belladonna poisoning when administered internally.

On examining the fluid extract chemically it was also found that an alkaloid was present. This alkaloid when removed and administered in the usual way produced dilation of the pupil.

The leaves were next examined physiologically, chemically and microscopically, with the result that chemically it was impossible to identify the alkaloid; the microscope failed to reveal the presence of a mydriatic plant, but physiologically the presence of a solanaceous plant was clearly established.

A fluid extract of castor-oil leaves was then purchased in the open market, and it was found that it neither gave a reaction for alkaloids nor produced dilation of the pupil.

A castor-oil leaf grown by the author, when submitted to the same examinations, proved conclusively that there was no indication of a mydriatic effect.

THE ASSAY OF DRUGS BY THE USE OF LIVING PLANTS.

BY HENRY KRAEMER.

An abstract of this paper was read in the absence of the author by Edward Kremers, who also explained the theory of ionization and the effect of the liberated ions upon living tissues. The paper will be published in a later issue of this JOURNAL.

A second session of the Section was held Tuesday evening. The first order of business was the election of officers for the ensuing year. The result was as follows: Chairman, Oscar Oldberg, Chicago; Secretary, Lyman F. Kebler, Philadelphia; W. A. Puckner, Chicago, being subsequently chosen as associate member.

The report of the Committee on Research was presented by the Chairman, A. B. Lyons, of Detroit. Standardization was considered to be the most important work of the committee, and in order to give the committee the standing that it ought to have and to enable it to carry on detailed investigations, the suggestion that it should have a laboratory of its own, under the direction of a competent man able to devote all his time to the work, was again stated. Meanwhile, the committee desires to be understood as utilizing the laboratory facilities of the various colleges of pharmacy, and to formulate a plan whereby it may co-operate with a committee of the American Medical Association or the recently organized Therapeutical Society for the more thorough investigation of the various drugs and medicines—that is to say, for their chemical and physiological assay, the work of one committee thus supplementing that of the other.

The reading of papers was resumed as follows:

PHARMACEUTICAL BACTERIOLOGY.

BY ALBERT SCHNEIDER.

The author said that students of pharmacy should be taught the relation of bacteria to the deterioration of the various drugs and preparations, and that they should possess such a knowledge of the subject as will enable them to examine various commercial products. On the other hand, an endeavor should not be made to teach students of pharmacy bacteriological diagnosis.

THE ALKALOIDS OF SAMBUCUS CANADENSIS.

BY W. C. ALPERS.

The presence of a hitherto undiscovered alkaloid in the bark of this plant was reported by the author. The principle responded to various of the alkaloidal reagents and appeared to possess the characteristics of coniine. It was not, however, submitted to ultimate analysis. The bark was the only part of the plant examined, and it was recommended to use the fresh article, as the odor entirely disappeared on keeping.

URINALYSIS BY THE PHARMACIST.

BY FREDERICK T. GORDON, U. S. Navy.

(Read by title.)

URINALYSIS BY THE PHARMACIST.

BY G. PARISEN.

(Read by title.)

EXAMINATION OF URINE, SPUTUM AND BLOOD.

BY F. W. E. STEDEM.

The author gave some general directions for the work indicated by the above title, and mentioned a number of reference books which he had found useful.

A lengthy paper, answering various queries proposed by the Scientific Section and reporting on the examination of numerous drugs and preparations of the market, was read by E. L. Patch, and was referred to the Committee on Revision of the U.S.P.

WILD CHERRY BARK AND ITS PREPARATIONS.

BY A. B. STEVENS.

During the course of his work the writer made over 250 estimations. Experiments were made to ascertain which portion of bark contained the glucoside, and it was found that the inner layer contained practically all of this principle, not much being found in the middle layer and none in the outer layer. The fact was also revealed that, there being more of the green layer of bark on the north side of the tree, more of the glucoside was found in this portion than that on the south side. Experiments with the fluid extract showed the pharmacopœial method to be unsatisfactory, in that the amount of menstruum is too small and also owing to the fact that evaporation does not leave a trace of acid. With regard to the syrup the author said that maceration should be carried on in the percolator in which the drug is to be percolated, and percolated directly upon the sugar.

ATROPA BELLADONNA, OR SCOPOLA CARNIOLICA.

BY A. R. L. DOHME AND HERMANN ENGELHARDT.

(Read by Charles Caspari, Jr.)

The authors said that according to the medical profession the scopola alkaloids are more efficient than are those of atropa. Triplicate assays of these drugs were made, using Professor Keller's method, and the results showed Scopola to be richer in alkaloids than Atropa.

NOTES ON INDIGENOUS PLANTS.

BY CASWELL A. MAYO.

The writer said that in the early history of Virginia frequent allusions were made to the indigenous drugs. He gave a number of extracts from the writing of Colonel William Byrd, Captain John Smith, Hugh Jones, and others of the early Colonial period, stating that these records were for the most part in such form as not to be available for the uses of the student of botanical history.

A SO-CALLED IPECAC—POLYGALA ANGULATA.

BY HENRY KRAEMER.

(Read in abstract by E. H. Bartley.)

This paper will be published in a later issue of this JOURNAL.

PROXIMATE ANALYSIS OF EUPATORIUM PERFOLIATUM.

BY CHARLES A. WALTER.

The important constituents isolated and studied by the author were: (1) a coloring principle ($C_{27}H_{30}O_{17}$); (2) a tannin ($C_{12}H_{18}O_7$); and (3) a bitter principle ($C_{35}H_{58}NO_{10}$).

WHAT REPRESENTATIVE PHARMACISTS AND PHYSICIANS THINK ABOUT PLASTERS.

BY SEWARD W. WILLIAMS.

The paper embodied a classification of replies to queries bearing on the question: "To what extent are official plasters employed in the practice of medicine and pharmacy?" The replies were from members of the American Medical Association and the American Pharmaceutical Association, and indicated that, for the most part, the official plasters are being superseded by the rubber-combination plasters.

COMPOUND SPIRIT OF ETHER AND ETHEREAL OIL.

BY GEORGE W. BOYD.

(Read by Charles Caspari, Jr.)

The author commented upon the unsatisfactory character of the compound spirit of ether and said that the difference in names leads to confusion.

THE NATURE OF COMMERCIAL SANGUINARINE NITRATE.

BY J. O. SCHLOTTERBECK.

The writer's experiments led to the conclusion that the so-called sanguinarine of the market is largely composed of chelerythrine. He therefore thought that the matter should be cleared up by the Pharmacopœia.

At this juncture the Section took a recess of a few minutes to permit of a Special General Session for the reading of the minutes of Council. It was reported that ten members had been added to the committee to prepare an auxiliary report on the National Formulary; also that a new section of the Association, to be known as the Section on Practical Pharmacy and Dispensing, should be instituted.

The Scientific Section having resumed its work, Dr. F. E. Stewart gave the report of the Committee on the Chairman's Address, which recommended that the suggestion of the chairman to bring the matter of drug cultivation before the Secretary of Agriculture be favorably acted upon and that a committee be appointed for the purpose. The report was adopted and a committee was selected as follows: H. H. Rusby, New York; Henry Kraemer, Philadelphia, and D. M. R. Culbreth, Baltimore.

The report of the Committee on the Revision of the U.S.P. was read, in the absence of the Chairman, Leo Eliel, by F. W. E. Stedem.

The report, which was a brief one, embodied recommendations for an alternative process for chlorine water; a 25 per cent. solution of carbolic acid in alcohol, to be known and dispensed as "household carbolic acid," and exact figures or working formulas for saturated solutions.

The following papers were then presented:

ON ALCOHOL AS AN ANTIDOTE FOR CARBOLIC ACID POISONING.

BY E. V. HOWELL.

(Read by H. W. Whelpley.)

The experiments carried out by the author tended to show that the effect of alcohol in counteracting the effects of carbolic acid is probably one of dilution.

A motion by C. S. N. Hallberg, recommending that a 25 per cent. alcoholic solution of carbolic acid be suggested to retail druggists, to be sold for household purposes, was adopted.

A paper on

CERATE OF CANTHARIDES,

BY G. E. BARKSDALE,

and one on

A NEW FORMULA FOR AROMATIC SPIRIT OF AMMONIA,

BY W. C. ALPERS,

were read by title.

ADLUMIA CIRRHOSA—A NEW PROTOPINE-BEARING PLANT.

BY J. O. SCHLOTTERBECK.

Protopine, as stated by the author, was the only alkaloid present in the plant, and its separation and purification were very easily accomplished. The author also said that protopine and fumarine appear to be very similar, and that if they were found to be identical, the Fumariaceæ should not be regarded as an independent family, but should be included in the Papaveraceæ. Following the rule of botanists, with regard to priority, the name of the principle should be fumarine.

ON THE PHARMACOPŒIAL RECOGNITION OF DIPHTHERIA ANTITOXIN.

BY J. W. ENGLAND.

The author considered the theory of action of diphtheria antitoxin and the methods of preparation. In its administration an excess should be used, rather than small quantities. In conclusion, the writer suggested that methods for its assay be adopted, so as to secure uniform products by manufacturers.

A motion to appoint a committee to consider the feasibility of the admission of this antitoxin into the Pharmacopœia was adopted. It was suggested that specialists should serve on the committee, and their appointment was left for a later time.

Dr. A. R. L. Dohme was reëlected to serve on the Committee on Research and Prof. J. O. Schlotterbeck was chosen to take the place of Prof. J. U. Lloyd, who preferred not to be re-elected.

The Section was then adjourned.

EDUCATION AND LEGISLATION.

The first session of this Section was called to order Friday at 2.15 P.M. by the Chairman, Dr. C. B. Lowe, of Philadelphia. Dr. F. E. Stewart was asked to preside while the Chairman delivered his annual address. It was in part as follows :

"In connection with the first of these subjects, viz., 'The Model Pharmacy Law,' I would call your attention to the following matters ; although it is quite probable that most of them will also be reported upon, yet their importance is sufficient to warrant me in thus presenting and reiterating them.

"In the first place, as pharmacy laws are enacted for the benefit of the citizens of the several States (and only incidentally for that of pharmacists), it is entirely reasonable and just that all expenses of administering such laws should be met by direct appropriation from the State treasuries, as is the case with the administration of other State laws, or State departments, and not by the fines or fees collected by the pharmacy boards. When the expenses of administering a pharmacy law are paid out of the accruing fines and fees, it lays the Board open to the criticism of rejecting applicants for registration so that they can get another fee from them, or of being unduly harsh in the administration of the law so that the accruing fines may swell their receipts. It also seems to me that it should be the duty of the prosecuting or district attorneys to prosecute all violators of the pharmacy law, as they do the violators of other laws of the State. In this connection I might say that the evidence which is required in some States to convict a non-registered pharmacist of the violation of the law by the compounding of prescriptions, viz., that such compounding was done in the presence of the witness, defeats justice, as in all such cases the compounding is done in privacy, special care being taken to exclude witnesses. It should be evidence enough that the written prescription was received over the counter and the compounded prescription handed back.

"It would seem to me that the time is near at hand when the expression of opinion, which was unanimously agreed to at the last meeting of this Section, viz., 'that none but recognized graduates should be received by boards of phar-

macy for examination,' should be crystallized into action. Some twelve years ago, in a conversation with Professor Maisch, he stated 'that if he did not hold a professorship in a college of pharmacy he should strongly urge this matter.' At that time perhaps few held such an opinion; at the present time probably the majority do.

"I should also like to see incorporated into each pharmacy law 'that the conviction of any pharmacist in a court of justice for violating the liquor or license law of his State should forfeit his certificate of registration.' This would be a much more effectual way of killing off the 'saloon druggist' than by simply fining him.'"

Having considered a number of subjects of a more or less educational character, the chairman then said:

"I am sorry that the good work done by many of the pharmaceutical colleges of our land is not more generally recognized by the public at large. Why is it that our rich men (even druggists themselves) leave their money to universities, hospitals, medical and technical schools, but seldom remember our own institutions? Is it because we have been so modest about their worth (pharmacists are generally most modest men) that the public does not recognize their value? If it were wise to let the public know how completely their fate is often in the hands of the pharmacist, the work of the colleges in turning out educated pharmacists would be better appreciated."

The address was referred to a committee consisting of Messrs. C. S. N. Hallberg, F. E. Stewart and F. W. E. Stedem.

The report of the Secretary, J. A. Koch, of Pittsburg, was read and referred to the Publication Committee.

The reading and discussion of the "Model Pharmacy Law" was then taken up, and occupied the attention of the members during the remainder of this session, the evening session and a portion of the time of the third session Saturday morning.

The draft of this law, entitled "A general form of pharmacy law suitable for enactment by the several States of the United States," was framed by Prof. J. H. Beal, of Scio, O., and was read by him section by section for discussion and amendment. The general scope and meaning of the proposed law were defined by the author as follows:

The Meaning of the Title "Model Law."—At the outset, the writer frankly admits that his idea of what the model should be differs widely from that of some of the foremost writers upon the subject, and he, therefore, feels called upon to set forth, briefly, his reasons for the draft which is herewith presented.

In the first place, the writer is not in accord with some as to the construction to be placed upon the title "Model Law." Many have understood from this title that the proposal is for a form of law which shall be *ideally perfect*, both from a public and from a professional standpoint. From this interpretation the writer is compelled, by what he believes to be the necessities of the case, to dissent. An ideal law would be possible of enactment only in an ideal community, and if communities were ideally perfect, such a form of law would be useless. What was meant by the resolution offered at Montreal was not a form of law which should be without fault, and, therefore, incapable of further improvement, but a *workable* draft, adapted to enactment in the various States where any form of law revolutionary in character would not receive serious consideration. While

this may be a disappointment to some who have expected that the model would present some new and startling innovations, the author is of the opinion that a draft based upon a conservative plan will be of far greater helpfulness in promoting progress in pharmaceutical legislation than one based upon purely theoretical considerations could possibly be.

General Plan of the Model Law.—In accordance with the view above expressed, it has been attempted to frame the model in accordance with the following principles :

(1) The model should be constructed, as nearly as possible, wholly of tried and tested material, selected from statutes already in force, and should consist of provisions which have withstood the test of experience, and have been found to work well in practice. Experiments should be tabooed, and new provisions not found in existing statutes should be admitted only upon the clearest evidence of their usefulness and practicability.

(2) The machinery required for the enforcement of the law should be simple and inexpensive, as every complication increases the liability to break-downs, and the difficulty of enforcing the law.

(3) The form of statement adopted for the various provisions should be as clear and simple as is consistent with the technicalities of legal phraseology indispensable to accuracy and certainty.

(4) The provisions of the statute should be confined to the creation, support and direction of the board of pharmacy, the requirements for examination and registration, the regulation of the sale of poisons, and the definition and punishment of offences against the law. Provisions regulative of adulterations, and other collateral matters should be left to the general statutes.

(5) Since experience has shown that nearly all State boards are hampered by lack of necessary funds for the enforcement of the law, the draft should provide ample revenue for the use of the board, and should allow its members such compensation as will justify them in devoting sufficient attention to the law to make it efficient.

The draft and the amendments proposed were referred to a special committee consisting of Messrs. J. H. Beal, Oscar Oldberg, S. A. D. Sheppard, C. S. N. Hallberg and W. C. Alpers.

The first order of business at the Saturday morning session was the presentation of the report of the Committee on National Legislation by the Chairman, F. E. Stewart. The report was brief and the following paragraph indicated the nature of the work accomplished :

“The question of National Legislation on the subject of patents and trademarks is, as you are aware, officially in the hands of a commission appointed by President McKinley for its investigation. So far as your committee was able to assist in the labors of said commission, by presenting to it the views of the Association, this has been done, and the subject of patents and trademarks as affecting medical wares has repeatedly been discussed by your committee with the commission.”

The Secretary of the Section, in the absence of the chairman of the committee, read the report of the delegates to the Pure Food and Drug Congress, at Washington, in March last.

A recess of the Section was then taken to permit of a special general session, at which the minutes of the Council were read. Among other matters reported

by the Council was the provision to print 100 copies of the Report on the Progress of Pharmacy for distribution.

When the Section resumed business a delegation from the Richmond Chamber of Commerce was heard on an amendment which the chamber proposed to the Brosius Pure Food Bill, now before Congress, but when the matter came up for discussion at the final general session it was laid on the table.

The report of the committee appointed to consider the draft of the "model pharmacy" law was received and the law, with some minor amendments, adopted as a whole by the Association.

A letter from Dr. Fred. Hoffmann, now of Berlin, was read by General Secretary Caspari. The author made a plea for the establishment of a National library and museum of chemistry, pharmacy and allied branches, and recommended following the examples of the Lloyd Library and that of Dr. H. Carrington Bolton.

A resolution approving the measures supported by the U. S. Pharmacopœia Convention for the establishment of a National Bureau for the Standardization of Weights and Measures was read by F. W. E. Stedem and adopted by the section at the final general session.

A paper entitled "Preliminary Education for Students of Colleges of Pharmacy" was read by W. C. Alpers, he being the chairman of a committee appointed to consider this question. Among other things the committee said:

"It seems to the committee that the teachers of our pharmaceutical colleges have the power to institute such reforms in their own hands, if they earnestly desire to do so. An example is set them in this respect by the larger universities in all parts of the United States, who for a number of years have appointed joint committees of professors and teachers of preparatory schools, for the purpose of evolving a scheme whereby a general university examining board shall be established, whose certificate shall admit to any of the colleges agreeing to the regulations. This board will assign a value to each subject, and the requirement in that subject will be fixed; but there will be such a variety of subjects to select from, as the rules of the particular institution or the fancy of the student may demand. This plan is being matured, and it is hoped that all the details will be decided this spring. There is no reason why a similar joint committee could not be appointed by our pharmaceutical colleges. In the entrance examinations the standard of a three years' high school should be the minimum, but, by selecting a large series of subjects and assigning a value to each one, the variations in the requirements of different schools and localities could be met."

The other papers read before the Section were: "Status of the Drug Trade of Maine Under the Prohibition Law of the State," by Charles K. Partridge; "Fluid Extract Labels," by E. G. Eberly; "Under What Restrictions Should Pharmacists be Permitted to Sell Liquors?" by G. C. Simms, and "Erroneous Prescriptions," by Louis Schulze.

The Chairman, C. B. Lowe, and the Secretary, J. A. Koch, were elected to serve in their respective capacities another year.

FINAL GENERAL SESSION.

The following were chosen officers of the new Section on Pharmacy and Dispensing for the coming year: Chairman, H. P. Hynson; Secretary, F. W. E. Stedem, and Associate, C. Lewis Diehl.

The Committee on General Prizes reported as follows: First prize, awarded to H. M. Gordin and A. B. Prescott, for their paper on "Directions for Certain Alkaloidal Assays;" second prize, to O. Schreiner and Edward Kremers, for their paper on "Addition Products of Oxides of Nitrogen to Sesquiterpenes;" third prize, to Henry Kraemer, for his paper on "The Valuation of Vegetable Drugs and Foods." The Hager Memorial Prize was not awarded, and the Maisch Memorial Prize was awarded to A. Van Zwaluwenburg and J. O. Schlotterbeck for their paper on "Structure and Development of Seeds."

Prof. Jos. P. Remington, Chairman, gave the report of the special committee appointed to consider measures for bettering the welfare of the Association. Considering the present financial condition of the Association, the committee advised that the salaries of officers be kept at \$2,000 annually. In order to increase more general interest in the Association, the committee proposed that an exhibit of pharmaceutical products be made a feature of the meetings. The report was adopted, and the following committee was appointed to arrange for an exhibit next year at the St. Louis meeting: Prof. Jos. P. Remington, Chairman, and Dr. H. M. Whelpley, a third member to be chosen by the Council.

The report of the Committee on the Status of Pharmacists in Government Employ was given by the Chairman, Geo. F. Payne, of Atlanta, Ga. The report was a very hopeful one, and showed that the status of pharmacists in the three departments of the army, navy and marine service is being very much improved.

The installation of the new officers then took place, Messrs. Remington and Thompson having been appointed to introduce them.

A special vote of thanks was extended the citizens and ladies of Richmond for their exceptional hospitality, and to the local Secretary and the Committee on Entertainment for their efforts in promoting the enjoyment and comfort of the members.

A vote of thanks having also been extended to the retiring officers, the business sessions of the meeting were brought to a close.

SOCIAL FEATURES.

The social features, were exceptionally interesting and enjoyable. On Monday evening President and Mrs. Prescott, assisted by a local committee, held a reception in the parlors of the hotel, which was largely attended, Governor and Mrs. Tyler being among the guests. Tuesday noon there was a carriage drive to various points of interest in and around the city, and Tuesday evening a concert was given by Polk Miller at the hotel. On Wednesday evening Governor and Mrs. Tyler tendered the Association a reception at the Executive Mansion. The reception was a charming affair, and was attended not only by the members and their ladies, but also by a number of well-known medical men of Richmond. There were no business sessions on Thursday, the entire day being given over to pleasure, which was had by a trip to Old Point Comfort and a stop at Newport News on the way down. At the latter place the large dry dock and shipbuilding works were visited and an inspection made of the Government vessels now in process of construction there. The points of interest included in the visit at Old Point Comfort were Fortress Monroe, the National Soldiers' Home and the Hampton Normal and Industrial

School. Some of the party visited the U. S. S. "New York," and after luncheon, which was had at the beautiful Hotel Chamberlin, the ladies were given a sail by Commodore Emmerson, of Baltimore, on his yacht "Nydia." On returning in the evening, Polk Miller, assisted by about a dozen negroes, gave an entertainment at the hotel. A trolley ride was taken on Friday afternoon, and in the evening, Prof. Wm. Simon, of Baltimore, gave an instructive address on "Wireless Telegraphy." The speaker demonstrated the principles of this system of telegraphy and gave a short *résumé* of its history. Thus came to a close a series of entertainments which, interspersed with the business sessions, will long make the Richmond meeting of 1900 a memorable one.

MINUTES OF THE ANNUAL MEETING OF THE COLLEGE.

The annual meeting of the members of the Philadelphia College of Pharmacy was held on March 26, 1900, at the College, 145 North Tenth Street; thirty-four members were present, Wm. J. Jenks presiding.

The minutes of the quarterly meeting of December 28th were read, corrected and approved. The minutes of the special meeting, held March 23d, were read and approved. The minutes of the Board of Trustees for the meetings of January, February and March were read and approved.

The Committee to Revise the By-Laws of the College reported that they had performed the duty assigned them, and submitted a copy of the revised By-Laws. The report was received, and the revised By-Laws as proposed were ordered to lie over for consideration until the next meeting of the College.

The Publication Committee of the AMERICAN JOURNAL OF PHARMACY presented a report covering the period from March 28, 1899, to March 26, 1900, and showing a cash balance to the credit of the Committee.

In the report of the editor of the JOURNAL it was stated, among other things, that the primary object had in view during the past year had been to make the JOURNAL of more general pharmaceutical interest rather than too strongly chemical or botanical in character.

The Librarian reported the addition to the Library of ninety-five bound volumes and thirty unbound volumes, besides the various exchanges, during the year, sixty-five volumes having been added.

The Curator reported that the Museum had received a number of valuable additions during the year, chief among which were a collection of biological cultures and a series of valuable microphotographs of different micro-organisms from the H. K. Mulford Co.; a collection of synthetic chemicals from the Elberfield Co., and a valuable and instructive collection of opiums from Gilpin, Langdon & Co. The report stated that the cabinet of official drugs and preparations that was placed in the reading room last fall was the first of its kind in any pharmaceutical college; that it was constantly used by the students, who appreciated it highly, and to whom it had proved of great benefit. The work of the instructors in preparing and arranging the specimens was commended.

The Chairman appointed the following delegates: To the National Convention to Revise the United States Pharmacopœia, to meet in Washington, D. C.,

on May 2d, Professors Remington, Sadtler and Kraemer; alternates, F. G. Ryan, J. W. England and J. L. D. Morison.

To the Convention of the American Pharmaceutical Association, to meet in Richmond, Va., on May 7th, M. N. Kline, Chairman; C. B. Lowe, F. G. Ryan, Wm. McIntyre and J. L. Lemberger.

To the meeting of the Pennsylvania Pharmaceutical Association, to be held in Ebensburg, on June 26th, H. L. Stiles, W. L. Cliffe, C. A. Weidemann, F. W. E. Stedem and E. M. Boring.

The long and faithful service rendered the College by the Treasurer of the Publication Committee was referred to and commented upon in highly complimentary terms, and a unanimous vote of thanks was extended to Henry N. Rittenhouse for the twenty-five years of faithful work he has given to the College in that important position.

A motion to elect, at this meeting, the two additional members of the Publication Committee, provided for in the proposed revised By-Laws, to assume their duties after the adoption of the revised By-Laws, was agreed to. A motion to elect the Committee on Pharmaceutical Meetings at this meeting was agreed to. George M. Beringer was appointed to fill the vacancy on the Committee on Deceased Members, caused by the death of Charles Bullock.

The election of officers and trustees being in order, Messrs. Ryan and England were appointed tellers, and the election resulted as follows: President, Howard B. French; First Vice-President, Wm. J. Jenks; Second Vice-President, Dr. R. V. Mattison; Recording Secretary, Dr. C. A. Weidemann; Corresponding Secretary, Dr. A. W. Miller; Treasurer, James T. Shinn; Librarian, Thomas S. Wiegand; Curator, Joseph W. England; Editor, Prof. Henry Kraemer.

Trustees for the term of three years: Wallace Procter, Edward T. Dobbins and Gustavus Pile. Trustee for the unexpired term of Dr. C. A. Weidemann (elected Secretary), George D. Rosengarten.

Publication Committee: Henry N. Rittenhouse, S. P. Sadtler, Wallace Procter, Henry Kraemer, J. W. England, J. P. Remington and R. V. Mattison.

Committee on Pharmaceutical Meetings: R. V. Mattison, J. P. Remington, H. L. Stiles, F. W. E. Stedem and Henry Kraemer.

On motion, the meeting adjourned.

W. NELSON STEM,
Secretary.

AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

Another attempt was made to establish an alliance of the teaching colleges and schools of pharmacy of the United States, at the Richmond meeting of the American Pharmaceutical Association. A constitution and by-laws were adopted, in which it was stated that the object of this conference shall be the interests of pharmaceutical education; the membership shall consist of duly accredited pharmaceutical faculties, and the time and place of meeting shall be coincident with that of the American Pharmaceutical Association. The officers for the ensuing year are: President, A. B. Prescott; Vice-President, Joseph P. Remington; Secretary and Treasurer, W. H. Bradbury. Executive Committee: J. H. Beal, W. Simon, E. Kremers, J. M. Good and George C. Diekman.

MINUTES OF THE PHARMACEUTICAL MEETING.

The last of the series of pharmaceutical meetings for 1899-1900 was held Tuesday, May 15th, with Prof. Samuel P. Sadtler in the chair.

Mr. Robert N. Riddle, of Philadelphia, gave a short but interesting talk on the manufacture of some of the more important fatty acids, sugar of milk, vanillin, etc. Mr. Riddle prefaced his remarks by saying that the processes for the manufacture of all the finer chemicals are kept secret, and that certain chemicals like vanillin and saccharine are covered over with patents simply to conceal the process of manufacture. He said that very little of the information contained in text-books on the manufacture of chemicals is reliable. The authors are not to blame for this, because it is impossible to obtain the information.

With regard to the manufacture of milk sugar, he said that two conditions are essential for its success, and these are a large supply of whey and means for evaporation. The organic compounds in milk appear to be difficult to precipitate, and it is only by prolonged boiling that they can be separated and a clear solution obtained.

In the manufacture of lactic acid, he said that the raw materials which contain least oil are the most easily fermented, hence rye and barley are to be preferred to other grains in this respect. After giving some of the important details in its manufacture, the speaker stated that this acid is not manufactured in this country—that it is all imported.

In giving the process for the manufacture of butyric acid, he said the statements that the presence of some putrefying animal substance is essential to the butyric fermentation are very erroneous. Nature has provided her own ferments, and these begin their work even while the grain from which the acid is to be manufactured is being boiled.

A paper on "Seidlitz Powders," by Joseph Huntington, P.D., was read in abstract by Prof. F. X. Moerk. The paper will be published in a later issue of this JOURNAL.

Prof. Jos. P. Remington called attention to some jars and glass tanks which had been sent to the College for exhibition, at his request, by the Appert Glass Company, of New York. These vessels are manufactured in all sizes up to a capacity of 40 gallons, and in speaking of this feature Professor Remington said that the use of large glass vessels for laboratory work had long been a desideratum. The special advantages claimed for this glassware are that it is non-porous and possessed of unusual mechanical strength. The jars and tanks may be graduated, and, being transparent, the measure of the contents can be told at once.

Some notes on "Gold and Sodium Chloride" were presented by Lyman F. Kebler, which will be published in a later issue of this JOURNAL.

A specimen of Southern prickly ash bark was exhibited by Mr. Kebler. It was a beautiful specimen, and produced when chewed a sensation similar to aconite.

On motion, the meeting adjourned.

FLORENCE YAPLE,

Secretary pro tem.

THE AMERICAN JOURNAL OF PHARMACY

JULY, 1900.

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICINAL DRUGS.

BY EDWARD R. SQUIBB, M.D.,
of Brooklyn, N. Y.

FOURTH PAPER.

THE OFFICINAL VARIETIES OF RHAMNUS OF THE U.S.P.—RHAMNUS FRANGULA AND RHAMNUS PURSHIANA (BUCKTHORN AND CASCARA SAGRADA).

In selecting examples for a fourth paper on this subject it seemed best to take substances of wide common usage and general applicability, not dependent upon an alkaloid or upon any single or separable active principle, but rather on the total extractive matter of the drug. The bark of the two officinal varieties of the Rhamnus family fulfil these conditions very well, being used in the same way for the same purpose, and for that purpose only, namely, to correct and control the condition of constipation. Neither one is a proper purgative or cathartic, nor even a very good evacuant. Both are laxatives, while the buckthorn is the more simply laxative or relaxing, and the cascara is more actively evacuant. If both be classed as laxatives the buckthorn must be said to be the milder and more gentle in operation. For the proper and best effect both should be given in small doses after meals for a noticeable effect only on the second day.

The bark of Rhamnus Frangula or buckthorn has been long known and used professionally and popularly as a laxative throughout continental northern Europe, where the shrub is indigenous. The bark of young trunks and branches is used, and that of older

and larger trunks is avoided as being different in properties and effects. In common with the willow the wood of the branches was, and probably is still, used for making a charcoal for sportsman's gunpowder, and this secures the peeling of the proper quality of the bark at the proper season. The bark is carefully air-dried and not used until seasoned for at least a year.

Buckthorn was introduced into the materia medica of this country about 1868-70 by Dr. John P. Gray, the well-known alienist, who, for so many years, had charge of the New York State Lunatic Asylum at Utica, and who was killed there by the pistol-shot of one of his insane patients.

Returning from a professional visit to some of the European hospitals for the insane, he brought a bag containing a few pounds of buckthorn. Finding it rather inconvenient to use in decoction or in substance by chewing, as was the practice abroad, he brought the bag to this writer, who advised the form of a fluid extract, made it into a fluid extract for him, and soon after imported from Hamburg the first considerable lots that are known to have come to this country. By January, 1872, the bark and fluid extract were accessible in the markets and by 1880 had so increased in use as to be admitted to the U.S.P.

From that time to the present, without special advertising or effort and against an active competition with *Rhamnus Purshiana*, which has had much special advertising and effort, it has steadily increased in appreciation and use. For more information in regard to it see *Ephemeris*, Vol. III, No. 2, pp. 1045-1052, 1887.

The bark of *Rhamnus Purshiana*, *cascastra sagrada*, was admitted to the U.S.P. in 1890. "Attention was first drawn to the virtues of this plant in 1878 by Bunday, of California."—National Dispensatory, Fifth Edition, 1894, p. 1375.

The shrub or small tree is indigenous to the Western coast of North America and seems to have been sometimes confused with other varieties of *Rhamnus*. See John W. Farlow, M.D., for a paper on "*Cascastra Sagrada*, and its Use in the Treatment of Constipation," in the *Boston Medical and Surgical Journal* for October, 1887, p. 402. See also papers in the *Ephemeris*, Vol. III, pp. 984-1243, 1887.

This bark, under the name *cascastra sagrada*, or simply *cascastra*, is now a large article of commerce here and is exported in very

considerable quantities, showing a very large and general usage. As found in the markets it varies much in quality and price, the variation consisting chiefly in the differing proportions of old and thick bark. It is believed on good authority that the effect of the bark of trunks and old branches is different in kind from, as well as inferior in degree to, the younger and thinner bark, and therefore preference is given to those lots that have the smallest proportion of old thick bark. But as lots, and bales in the same lot, differ much, it is difficult to get a succession of lots of fairly uniform quantity, even with the screw of price taken off. In this respect cascara is very different from buckthorn (*Frangula*), which is fairly uniform in quality.

For a close comparison of the use of the officinal alcoholic menstruum with the 10 per cent. acetic acid menstruum, two portions of 500 grammes each of each variety of *Rhamnus* were carefully and accurately made into as many portions of 500 c.c. each of fluid extract by the officinal process, the rate and degree of exhaustion noted and compared in a table, and then the finished results compared.

First for the U.S.P. process and product, 500 grammes of buckthorn (*Frangula*), in No. 40 powder, was moistened with 225 c.c. of a mixture of five volumes of alcohol (91 per cent.) and eight volumes of water, firmly packed, filled with menstruum, macerated for forty-eight hours and then percolated slowly.

The percolate was received in successive fractions of 100 c.c. each, each fraction weighed and the weight of 100 c.c. of the menstruum subtracted, to get the series of differences.

Next for a parallel process with a 10 per cent. acetic acid menstruum, used in exactly the same way at the same time, gave the two columns of parallel differences occupying the first part of the table and completing the first pair, of 500 grammes each of the same powder of buckthorn.

For the second pair, cascara (*R. purshiana*), the U.S.P. requires the bark to be in No. 60 powder, as it is thicker, harder and more difficult to exhaust. The 500 grammes of this was moistened with 225 c.c. of the U.S.P. menstruum, "diluted alcohol" (41 per cent.), packed firmly, filled with the menstruum, macerated forty-eight hours and then percolated slowly. The percolate was received in

successive fractions of 100 c.c. each, each fraction weighed, and the weight of 100 c.c. of the menstruum subtracted to get the series of progressive differences.

Then a parallel process was managed exactly in the same way at the same time with a 10 per cent. acetic acid menstruum, giving the parallel column of differences of the second portion of the table.

	Grammes.
The weight of 100 c.c. of officinal U.S.P. menstruum for buckthorn, at average room temperature, is	95'08
100 c.c. of 10 per cent. acetic acid menstruum is	101'19
For cascara, 100 c.c. U.S.P. menstruum ("Diluted Alcohol") is 93'48	
100 c.c. of 10 per cent. acetic acid is	101'19

The first four fractions of percolate from each of the four percolations were added together and reserved.

The remaining thirteen fractions were together evaporated on a water-bath to 60 or 70 c.c. of extract and this was dissolved in the reserved portion and the whole was made up to 500 c.c. by the addition of fresh menstruum to finished fluid extract.

The 500 c.c. of finished fluid extract from each menstruum weighed as follows, and gave the following proportion of nearly dry extract :

	Per Cent.
Buckthorn by U.S.P. menstruum, 513'0 grammes extract	22'3
" " acetic acid " 542'1 " " " " " " " " " " " "	22'5
Cascara " U.S.P. " 527'1 " " " " " " " " " " " "	32'5
" " acetic acid " 565'5 " " " " " " " " " " "	42'7

The finished fluid extract of buckthorn by acetic acid contained 8.8 per cent. of free acid.

That of cascara, 9.7 per cent.

Fluid extracts made by repercolation gave of free acid—from buckthorn, 7.7 per cent.—from cascara, 7.8 per cent.

The percolation having been carried to practical exhaustion in both varieties, the fluid extracts must be accepted to represent the value of the drugs, and this value is contained in cascara in a much larger proportion of extract. But this is due not only to difference of menstruum, but also to difference of fineness of the powder percolated. The U.S.P. directs buckthorn in No. 40 powder, and cascara in No. 60, and for this reason the latter yields the larger proportion of extract, and makes any close comparison of degree and

rate of exhaustion impracticable. The powders should have been of the same degree of fineness. So far, however, as the table goes, it shows the U.S.P. menstruum to be the best for exhaustion.

But, in comparing the resulting fluid extracts, the acetic acid menstruum yields much the best preparations in every respect.

RATE AND DEGREE OF EXHAUSTION.

Fractions of Percolate.	RHAMNUS FRANGULA, BUCKTHORN.		RHAMNUS PURSHIANA, CASCARA.	
	DIFFERENCES.		DIFFERENCES.	
	U.S.P. Menstruum.	Acetic Acid Menstruum.	U.S.P. Menstruum.	Acetic Acid Menstruum.
	Grammes.	Grammes.	Grammes.	Grammes.
1st 100 C.c.	9'55	8'38	12'28	11'27
2d " "	8'05	6'88	11'33	10'45
3d " "	5'71	5'34	10'56	9'21
4th " "	3'94	3'31	9'36	8'00
5th " "	2'74	2'68	6'13	6'12
6th " "	1'62	1'48	4'55	4'84
7th " "	1'16	1'05	2'18	3'08
8th " "	'93	1'01	'38	1'37
9th " "	'92	64	'21	'77
10th " "	'47	'62	'00	'47
11th " "	'40	'40	'13	'39
12th " "	'24	'48	'07	'20
13th " "	'23	'25	'02	'29
14th " "	'41	'46	'11	'25
15th " "	'19	'22	'00	'14
16th " "	'00	'26	'00	'19
17th " "	'13	'10	'00	'07
	36'72	33'56	57'31	57'11

The U.S.P. fluid extracts of both buckthorn and cascara are intransparent, almost black, of the consistence of thin syrup, and have a considerable deposit.

Those from acetic acid are also intransparent but less black, of thinner consistence, and with very little deposit.

Diluted in the proportion of 1 c.c. to 60 c.c. of water, the U.S.P. buckthorn gives an opaque mixture with a heavy deposit.

U.S.P. buckthorn gives an opaque mixture with a heavy deposit.

“ cascara gives a muddy mixture with a heavier deposit.

Acid buckthorn gives a nearly clear dilution, very slight deposit.

“ cascara gives a nearly clear dilution, heavier deposit.

These dilutions, which are about right for administration, are all bitter, but of quite different degrees and character of bitterness. The U.S.P. cascara is a moderately strong and not an agreeable bitter. The acid cascara is quite as strong a bitter, but more agreeable on account of the acidity which is barely perceptible.

The U.S.P. buckthorn is very slightly bitter—hardly disagreeably so; and the acid buckthorn has this very slight bitterness agreeably modified by the perceptible acidity.

On the whole, the sensible properties are decidedly in favor of the acetic acid menstruum.

But this does not serve to compare the therapeutic or medicinal value of the menstrua, and as there is no separable active principle for comparison by quantitative assay this becomes a difficult point, not to be reached with critical accuracy.

Still, as the barks have a very decided and uncomplicated therapeutic activity, it was thought that a useful comparison might be made by dosage administration.

The two fluid extracts of buckthorn and cascara each represented the bark from which it was made in the proportion of cubic centimetre for gramme (or minim for grain), and with these a comparison of physiological activity was attempted.

A person was found in fair ordinary digestive health with regular habits of diet and exercise, having a daily alvine discharge. This daily discharge was of fairly uniform character, small in volume but hard in consistence, of good dark color, well elaborated and discharged slowly with much effort, and by habit, without desire, at bedtime.

In short, this is a case of simple constipation kept under control by force of habit, and although it is but a single case, and as such is a law unto itself only, it served fairly well upon which to measure the activity of these fluid extracts. The time for the habitual daily discharge was bedtime. The time for taking the doses was after each of the three daily meals. The intervals after the general trials

in which to get back to the original habit were never less and generally much longer than a week.

By experiment it was found that a convenient dose by which to note the effects was 0.5 c.c. = 8 minims in about 30 c.c. = 1 f \bar{z} , of water, and the time to look for the effect was the bedtime of the second day, after one dose or two doses or three doses on the first day, etc.

First Testing.—The U.S.P. buckthorn. A morning dose of 0.5 c.c. produced no perceptible effect upon the discharge of the bedtime of the first or second day. Interval of three days.

2d trial. A morning and midday dose of 0.5 c.c. each gave no perceptible effect at bedtime of the first or second day. Interval of three days.

3d trial. A morning, midday and evening dose gave a very slight effect at bedtime of the second day. Interval of three days.

4th trial. A dose after each of the three meals of the first day, and after the morning meal of the second day—four doses in all—gave a moderate but distinct effect on the consistence of the discharge at bedtime of the second day, without any griping or other disturbing effect. Interval of eight days.

Second Testing.—The acid buckthorn. Taking it as assured that this preparation is at least not very much less active than that of the U.S.P., the first three trials were all made by doses after the meals of the first day, and the bedtime discharge of that day was slightly increased in volume, but in other respects unchanged by the three doses. The fourth dose after the morning meal of the second day, to have been parallel to the U.S.P. preparation, should have been waited for till bedtime and should then have given a moderate but distinct effect on the consistence of the discharge. But the condition became imperative, producing a free discharge within three hours after the fourth or morning dose of the second day, without any griping or other disturbance up to the period of urgency.

That is, four doses (2 c.c. in all) of the U.S.P. preparation of buckthorn gave a moderate effect in about thirty-five hours, while the same quantity of the acetic acid preparation under closely similar conditions gave a full effect in about twenty-seven hours. This experiment repeated in the reverse order, that is, the acid preparation first and U.S.P. second, after three days' interval gave similar results with the acid preparation in thirty hours, U.S.P. in thirty-

three hours, giving an advantage to the acetic acid menstruum which could hardly have been all accidental, and it is therefore concluded that the acid menstruum is at least equal in medicinal value to the alcoholic.

A useful comparison of the two fluid extracts of cascara was more difficult on account of the tendency of cascara to gripe unless some corrigent was used, and such use confused the experiments. By repeated preliminary trials it was found that cascara was much more active than buckthorn, the proportion being about 0.3 c.c. of cascara to give the quantitative results of 0.5 c.c. of buckthorn, but the results were so different in quality as to badly confuse the relations. The best that could be done with cascara was to find that a dose of 0.5 c.c. of the U.S.P. fluid extract given after the morning and midday meals gave an average of purgative—not laxative—effect and of griping, and that the same doses and similar management with the acetic fluid extract gave practically the same results, so that there is no discoverable difference either in the activity or the harshness of the fluid extracts as made with the different menstrua.

Whilst these experiments make no claim to great accuracy of results, they do fairly establish the conclusion that the acid menstruum is at least fully equal to the alcoholic, with all the possible differences in favor of the acid.

Incidentally these experiments offer an opportunity for a useful comparison of the medicinal effects of the two officinal varieties of *Rhamnus*.

The cascara has nearly double the activity of buckthorn, the equivalent doses being 0.3 c.c. of cascara to 0.5 c.c. of buckthorn, but in this proportion, and in other proportions tried, cascara gripes while buckthorn does not. The effect of a good corrigent to prevent the griping is needed in the use of cascara. Cascara is an evacuant and is liable to leave a lingering action on the lower bowel. Buckthorn is a mild laxative, acting insensibly and leaving no irritability or after-action. It needs no corrigent, and is not a disagreeable bitter, as is cascara. Buckthorn is not a good purgative, or even a good evacuant, but is an excellent mild laxative, and in effect is not unlike the general effect of blue mass.

Cascara is not a therapeutic duplicate of senna, yet is much like

it in the character and quality of its effects, with the advantage of smaller dose.

Buckthorn bears a somewhat similar relation to rhubarb, but is more simple and mild in operation, is more limited in application, and required in much smaller doses for its best effects. All are laxatives and produce feculent discharges, whilst salines and mineral waters are aperients and tend to produce watery discharges.

The two officinal varieties of *Rhamnus* are simple laxatives, and if kept within their scope and skilfully applied they seem well adapted to the very extensive use into which they have grown. The smallness of the dose in which they are effective is accounted for in the circumstance that they give bilious discharges, and discharges with the color and character of bile indicate stimulation of the liver, while stimulation of the liver indicates increased secretion of bile, which of itself would give a laxative effect without buckthorn, just in the way that mild mercurials are supposed to act; that is, a stimulant to the liver is the excitant to increased secretion of bile, and bile is the natural laxative of the digestive process.

A very good way, if not the best way, to use the fluid extract of buckthorn to correct a constipation is to give 0.5 c.c. diluted with about 30 c.c. of water after each meal for one day, and for one or two meals of the second day, or until a mild laxative effect is obtained. Then to reduce the number of doses to one or two a day for one or two days—then to one a day—then on alternate days—then once or twice a week until a natural habit is established, and no longer. But as each case needs a little special management, it is only practicable to give a general plan of application, to be modified by the effects in individual cases, with great caution not to get an evacuant effect when only a laxative effect is desired. In many individuals a dose of 0.5 c.c. after the morning meal for three or four days will give the appropriate laxative effect when 2 c.c. given at one dose would be evacuant and would leave a condition of costiveness as bad as the original condition for which the buckthorn was taken.

A FALSE CINNAMON has been examined by Micko. It is the bark of an unknown species of *Cinnamomum*, but does not contain the aromatic cinnamon oil. It is also exceedingly mucilaginous.—*Zeitschr. d. Nahr. u. Genuss.*, 1900, p. 306.

A CHEMICAL STUDY OF ASTRAGULUS CARYOCARPUS.

(PRELIMINARY.)

BY G. B. FRANKFORTER.

It has been stated that the fruit of the *Astragalus caryocarpus*, in certain stages of its growth, contains a poisonous substance which resembles in some respects that which is supposed to exist in *Astragalus mollissimus* or common loco plant, *Astragalus drummondii*, *Astragalus oxytropus*, *Astragalus pattersoni* and several others of the same family. Up to the present time, the *A. caryocarpus* has not been carefully studied, and reports are as unreliable as in the case of many other members of the family. O'Brien (Bulletin 25, Agricultural Experiment Station of Colorado) refers to it, without, however, making any special examination of it. Chestnut, in his "Catalogue of Plants Poisonous to Stock" (Annual Report of the Bureau of Animal Industry, of 1898), mentions several species of *Astragalus*, including *A. hornii* and *A. bigelovii*, and concludes that other species are likewise poisonous. In fact, from both written and unwritten reports, it is quite probable that all of the species of *Astragalus* in the Western and Northwestern States have been regarded as poisonous. As *Astragalus caryocarpus* was formerly very abundant in Eastern Nebraska, the writer had excellent opportunities for studying its physical characteristics, and later, for studying it from the chemical point of view.

The *Astragalus* belongs to the Pulse family and is well represented throughout the Western and Northwestern States. The *A. caryocarpus* grows abundantly on the wild prairie lands of Kansas, Nebraska and parts of Dakota, but is rapidly becoming extinct as the prairies become cultivated. While under ordinary conditions it refuses to become civilized, it does, however, grow on cultivated soil. Botanically the plant is known as the "ground plum," but it is better known in the Western States as "hog-apple," a name given to it, it is said, because swine devour the ripe fruit voraciously.

Regarding the poisonous properties of *A. caryocarpus*, I can state that I have often eaten the fruit in its various stages of growth and have never experienced the slightest poisonous effect; nor have I known of but a single case where poisoning seems to have come from the plant. There is in the unripe fruit a bitter taste which lingers after the characteristic sweet taste has disappeared. That

this bitter taste is due to an alkaloid there can be little doubt. It seemed to be located in the woody part of the fruit and was later found in the plant itself. The work of O'Brien on the "loco weed," already referred to, likewise indicates that *A. mollissimus* is not poisonous, notwithstanding the many reports to the contrary and the fact that distinct alkaloidal reactions were obtained by him.

ASTRAGULOSE.

Among the peculiar properties of the ripe fruit of the *A. caryocarpus* is its peculiar sweet taste, due to the presence of a carbohydrate. It is probable that this sugar will account for the vulgar name above mentioned. It would likewise account for the somewhat mythical statement of its use by the aborigines of the plains. I have positive knowledge of its use by the early settlers of the plains, especially in the making of pickles.

An examination was begun by a preliminary test of the juice of the ripe fruit. It gave all of the common tests for the sugars, being optically active, reducing Fehling's solution and forming a beautiful hydrazone. Material was therefore gathered preparatory to a careful examination.

The fruit upon which the following experiments were made was collected about the middle of June, when it had reached maturity. In this ripe state it resembles the common small green plum, with frequently a peach color when not too much protected from the sun. In the preliminary examination, 1 kilo of the ripe fruit was macerated and the juice removed by pressing through a linen cloth. About 350 c.c. of the impure juice were thus obtained. The fibrous matter was extracted with water, filtered and the filtrate added to the original juice. At this stage the juice had a yellowish-green color and a peculiar sweet taste. It was purified by passing through a filter press, then treating first with sodium sulphite and afterward with basic lead acetate and filtering. Excess of lead was removed by sulphuric acid and the clear filtrate evaporated on a water-bath. The residue was a dark brown syrup showing indications of decomposition. It was redissolved in water, again purified and evaporated on a water-bath. The same brown residue was obtained. An examination showed the presence of a considerable quantity of free sulphuric acid. It was supposed, therefore, that the change of color was due to the presence of free acid. The residue

was again dissolved in water and the free acid removed by treating with barium hydroxide. The barium sulphate was filtered off and the excess of hydrate removed by carbon dioxide. The same brown residue was obtained on evaporation. It was evident, therefore, that the substance decomposed by simple evaporation on a water-bath. This residue was subsequently examined for the alkaloids, the results of which will be tabulated later on.

From the repeated processes of purification given above, the amount of sugar seemed to be reduced to such a proportion as to make it undesirable to proceed further. Accordingly, the method was tried again, with larger quantities, modifying so as to remove completely any free acid. About 15 kilos of the fruit were treated as indicated above, except that, instead of basic lead acetate, aluminum hydroxide was used. The free acid was removed by barium hydroxide. The solution still had a slight color, and was further purified by filtering through animal charcoal. This practically clarified the solution. A small quantity was evaporated on a water-bath. It again turned brown. The remainder of the solution was set aside and allowed to evaporate spontaneously. After several days the solution became concentrated enough to appear syrupy. It had changed slightly in color, becoming a light yellowish-brown. It refused to crystallize from all of the common solvents. From alcohol, it appeared as an amorphous powder; from the other solvents, as a syrup. This syrup was later obtained as a solid substance by evaporating in a vacuum desiccator over sulphuric acid. After several days' drying in vacuum, the substance became a solid mass, which, upon rubbing, became a light gray powder. This powder was hygroscopic, and still possessed the same sweet taste. It reduced Fehling's solution and turned the plane of polarization. The specific rotation was taken after the substance had been repurified twice from alcohol and animal charcoal and dried over sulphuric acid. The substance, thus purified and dried, had a specific rotation $(\alpha)_D = + 38.5$. The melting point was $95^\circ-98^\circ$ C. Analyses were made, the results of which corresponded best for the ordinary disaccharide.

THE PHENYLHYDRAZONE.

By boiling a concentrated solution of the substance with phenylhydrazine, a well-defined hydrazone was precipitated from the solu-

tion. The substance was amorphous. It dissolved in alcohol with difficulty, and precipitated out on evaporating off the alcohol as a fine crystalline powder. When first precipitated it was light brown, but on standing for some time it changed to a dark brown. The purified substance had a melting point of 186° – 188° C. An analysis indicated a hydrazone of a hexose.

No conclusion can be drawn from the above facts as to the size of the molecule. Many of the more complex sugars break down by treating with phenylhydrazine into simple hexoses and then form hydrazones. It is possible that such a reaction takes place here, as it is necessary to boil for some little time before the hydrazone is formed. Another indication that the substance breaks down is the fact that the optical activity changes by boiling or on standing. As an instance of the change in the specific rotation, a half pound of the once purified syrupy mass was placed in a desiccator over sulphuric acid and allowed to remain for several months. When the substance was finally removed for continuing the work, it was found to have lost its optical properties; it had become practically inactive. At the same time it had increased its reducing power. It was rather expected in the beginning that this sugar, notwithstanding the fact of its peculiar properties, might be a common form, either dextrose or lævulose. The data obtained, however, practically excluded such a possibility. The fact that it becomes inactive on standing makes the problem complex. In becoming inactive, the sugar undoubtedly breaks down, resulting in either a simpler inactive sugar, together with certain inactive by-products, or in two sugars with equal dextro and lævo properties. The latter is only a bare possibility, the former is probable.

From recent stereochemical developments of the sugar group by E. Fischer, a great number of isomeric forms is possible. Many of these forms have already been made synthetically, while a few have been found in nature. Most of those forms thus far found in nature belong to the so-called mono- and di-saccharides, although it is quite probable that as our knowledge of the group grows, simpler forms like erythrose and pentose, together with more complex forms like heptose, octose and nonose, will be found. That many polymeric forms of the monosaccharides exist is evident from the occurrence of raffinose and gentianose and from the peculiar nature of the starch and cellulose groups.

While analysis of the substance in hand indicated a probable disaccharide, further work will have to be done before the size of the molecule can be finally determined. Derivatives are now under examination which, it is hoped, will throw new light on the substance.

AN EXAMINATION OF THE PLANT.

In the preliminary examination of the fruit, the apparently decomposed residue mentioned was incidentally extracted with chloroform. On evaporating off the chloroform, a small quantity of a light-colored substance remained. On first examination this substance appeared amorphous, but on carefully examining under the microscope it was found to be crystalline. These fine needle-shaped crystals were especially distinct if the residue was first treated with a small quantity of ether. An examination of these crystals, so far as possible, was made. They were found to be organic and to contain nitrogen. They had a bitter taste, were soluble in chloroform, slightly so in ether and almost insoluble in alcohol. They gave distinct alkaloidal tests, although the quantity was insufficient to make an extended examination.

In the examination of the plant itself, the roots as well as the stems and leaves were taken. Several methods of extraction were tried, including those given by Dragendorff and Otto, but the best results were obtained by extracting the material with dilute alcohol slightly acidified with sulphuric acid. About 4 kilos of the material were thoroughly triturated and enough alcohol poured over the material to completely cover it. After standing several hours, it was transferred to a 5-litre flask and the alcohol distilled off rapidly by steam. On evaporating the distillate to dryness, an apparently amorphous residue remained. An examination of this residue under the microscope revealed fine acicular crystals very similar to those found in the fruit. As in the case of the fruit, the quantity was so small that no successful means of separating these crystals from the amorphous substance could be found. These crystals were examined and found to give many of the characteristic alkaloidal reactions. They contained nitrogen and formed a well-crystallized platinum double salt. Analysis was rendered impossible on account of the small quantity of material and on account of the difficulty in separating the crystals from the amorphous substance.

An examination of the aqueous distillate, collected after the alcohol had been removed, revealed the presence of a substance which gave a very peculiar odor when treated with ammonia. The amount was very small. Distillation was now stopped and the water extract examined. It was first purified as far as possible by passing through a filter press, then treated with barium hydroxide to remove the excess of sulphuric acid. The barium sulphate carried down much of the coloring matter with it, so that the solution, after filtering, was almost clear. The whole of the solution was evaporated to dryness on a water-bath. The residue resembled very closely that obtained from the fruit. A portion of the residue was extracted with chloroform. On evaporating the chloroform, a light-colored powder remained. This substance had alkaloidal properties and resembled very closely the substance obtained from the fruit, although no crystals could be obtained on account of the large proportion of amorphous matter. In attempting to separate the amorphous substance from the crystals, the quantity of ether sufficient to remove the amorphous matter likewise dissolved the crystals. Traces of crystals were obtained by treating with alcohol, which only partially dissolves the amorphous matter. Distinct alkaloidal reactions were obtained, as in the case of the substance obtained from the fruit, even to the formation of a platinum double salt. Lack of material made it necessary to curtail experiments at the present time, but it is believed that, with abundance of the plant, an alkaloid can readily be obtained.

UNIVERSITY OF MINNESOTA.

NOTES ON GOLD-SODIUM CHLORIDE.

BY LYMAN F. KEBLER.

If any one will take the trouble to obtain quotations from the various manufacturers or consult their price lists, it will become apparent at once that there must be either a considerable margin of profit for some, or that the gold-sodium chloride varies much in composition. The difference in prices or information on the labels is such, however, that the various makes come into direct competition with one another. For example, 1 ounce of gold-sodium chloride, U.S.P., in $\frac{1}{8}$ -ounce vials, is quoted by several makers

(wholesale price list) at \$5.90, \$6.10, \$7.50, \$9.60 and \$14.50, respectively. Again, some makes, without any specifications as to quality, are generally quoted a few cents below those containing information as to quality.

It must be remembered that the 1890 Pharmacopœia requires this article to contain 30 per cent. of metallic gold, and a commercial article may contain less for photographic purposes, but the latter should be so labelled as not to be brought into direct competition with the more costly article. If a certain article is prepared for photographic purposes or for some other purpose, let it be so labelled as not to be misleading.

In order to get positive information about this article, the writer secured a number of samples, and a careful examination of the same gave the following results :

ANALYTICAL DATA OF GOLD-SODIUM CHLORIDE.

Number.	Condition.	Reaction to Ammonia on Glass Rod.	Reaction to Litmus.	Weight in Grains in 15-Grain Vial.	Solution Containing 15 Grains in 100 c.c. Distilled Water.	Marks on Labels.	Actual Per Cent of Metallic Gold Gravimetric.	Per Cent. of Gold Based on 15 Grains Gravimetric.
1 {	Quite moist	} None	Acid	13'55	{ Slightly opalescent }	15 grains	23'55	21'29
2	Dry							
3	"	"	"	14'56	{ Slightly opalescent }	"	25'00	24'68
4	"	"	"	17'53	Clear	{ U.S.P. }	{ 28'31 }	32'91
5 {	Slightly moist	} "	"	14'45	Clear	{ 15 grains U.S.P. }	30'30	29'02

The amount of material contained in each vial was estimated by removing the stopple, determining the gross weight, then carefully removing the chemical by means of water, drying the vial and obtaining its weight. From these weights the amounts of gold-sodium chloride in each vial can readily be calculated, and if there should be an error in any direction, it is quite likely to be in favor of the chemical.

The metallic gold was estimated as follows : Transfer the contents of a vial into a 250 c.c. evaporating dish, by means of 100 c.c. of a

1 per cent. solution of pure sulphuric acid. In this mixture dissolve 2 grammes of pure oxalic acid, then place the whole on a steam bath for two hours or until all of the gold is reduced to the metallic state. Decant the clear liquid as closely as possible, wash the gold with distilled water, dry, ignite and weigh. This method works well, but the volumetric process for this purpose appeared to be valueless.

From a careful perusal of the data contained in the table above, it can readily be seen that all the samples were of good quality, but there is a wide variation in the percentage content of gold.

In order to fully comprehend the actual difference in money, existing between the various samples, it is only necessary to compare the figures below :

Number.	100 Ounces Gold-Sodium Chloride Contained Pure Gold.	Cost at \$21 per Ounce.
	Ounces.	
1	21.29	\$447 09
2	26.13	548 73
3	24.68	518 28
4	32.91	691 11
5	29.02	609 42

The greatest difference, based on the cost of the gold only, amounts to \$244.02, or, by eliminating the highest, which appears to be somewhat abnormal, the difference becomes \$162.33. In other words, the purchaser of 100 ounces of the article containing the smallest per cent. of gold is paying \$162.33 for something he is not getting. In this case, as in so many others, the cheapest is the most expensive.

THE CULTIVATION AND ECONOMICS OF AGAVES.

BY FREDERICK L. LEWTON.

The agaves are a most characteristic group of plants of the hot and arid regions of the North American continent. They include the largest and tallest of our herbaceous plants, and on account of their size, symmetry and elegant proportions were well named by Linnæus from the Greek "*Αγαπή*," signifying noble, admirable or wonderful.

Nearly all the agaves are natives of Mexico, Central America and the Southwestern United States, a few others being found in South America and the West Indies. *Agave Americana*, the best known species, is cultivated along the Mediterranean in India and Africa.

The thick fleshy leaves of agaves, arranged around a very short axis in the form of a tuft, are in most species armed with stout terminal spines and prickly or horny margins. The young leaves wrap very tightly around each other, forming a long cone-shaped central bud. The outer surface is adapted to resist the evaporation of moisture, and the roots as well as the leaves contain a large amount of mucilage and saponin, which retain water with great tenacity, and enable the plants to live in the most arid regions.

These plants grow slowly, and under cultivation are so rarely known to bloom as to have long been called "Century Plants." Under their natural conditions they reach maturity in from three to fifteen years, according to the species. When this period is reached the new leaves become smaller and narrower and the central bud thickens. The flower-stalk appears and rapidly shoots upward, sometimes reaching a height of forty feet. In some species this flower-stalk looks like an immense candelabra bearing many flowers of a greenish-yellow color. Such a great expenditure of vitality usually exhausts the plant, and after sending out suckers or offsets it dies, to be succeeded by the next generation. Some species, however, bear annual leaves and may bloom annually, but these are not of great economic importance.

There are over 150 described species of agaves, about one-half of which are indigenous to Mexico, but when these plants become better known there is no doubt but that the number of species will become greatly reduced.

Much remains to be done in the way of studying these plants, as in but few cases can their well-known and important economic products be referred to a certain species.

ECONOMIC PRODUCTS.

The uses to which agaves have been put are almost as extensive as those of the famous cocoanut palm.

Of the more important economic products may be mentioned ropes, twine, thread, sacks, hammocks, saddle-cloths, hats, baskets,

brushes, paper, etc., from the leaf fibres; food, drink and medicine from the sap; soap substitutes from the leaves and roots, handles for lances, fishing poles, razor strops, scouring mats, and walls for houses from the flower-stalks; needles and thread, thatching for roofs, and fodder for cattle from the leaves. The plant itself is much used for hedges.

FIBRES.

The Mexican agaves, from which fibre is extracted, have various common and local names. In commerce and in books of travel these names have become greatly mixed. Dr. Rose says that "maguey" is a generic term applied to most of the agaves proper, *i. e.*, those having evergreen leaves. "Lechuguilla," which means "cabbage-like," is applied to many of the smaller agaves as well as to other plants.

Tampico fibre or Tampico hemp is the term applied to all fibre shipped from the port of Tampico on the Gulf Coast, and under this term is included the fibre of several species of agave as well as that from one or more species of yucca. "Ixtle" is the fibre of the short-leaved agaves, and "guapilla" that of the linear-leaved species. "Tapemete" and "Huila" are local names for the fibre from certain agaves, the latter being a very coarse, harsh fibre, mostly used for making heavy ropes. "Henequen" or "Sacci" is a fine white agave fibre produced in Yucatan, while "Sisal hemp," "Sisal grass" or "Yaxci" is produced in Southern Mexico, chiefly in Campeche.

PREPARATION OF FIBRE.

The preparation of Tampico hemp is best described by an eyewitness, Mr. E. W. Nelson, as follows:

"The leaves are from 15 to 30 inches long. Only the tender, unfolded leaves forming the central bunch are used, as the fibre of the old outer leaves is too coarse and brittle. This central spike of unopened leaves, called "Cogollo," is gathered by means of a short staff, 4 feet long, with an iron ring fitted by a ferrule to one end.

"The iron ring is slipped over the cogollo and a quick wrench breaks it loose, and it is then placed into a basket on the laborer's back. The man gathers a backload in this way and proceeds to a large bush or small tree, where he can get shelter from the sun,

and, placing the leaves in a heap near the base of the tree, proceeds to clean out the fibre.

“ A short block of yucca wood is laid on the ground close to the tree and the pointed end of a long triangular blade of iron, with a wooden handle, is thrust into the base of the tree trunk and held across the block of yucca wood. The workman then strips the edges from the agave leaves to rid them of bordering spines and, holding the butt in the right hand, lays the leaf on the wooden block and, pressing down the iron, draws the leaf through, thus scraping out most of the pulpy matter.

“ Then a small wooden grasper, with a knob at one end, has the free ends of the fibre wrapped about it in a ‘half-hitch,’ and, by grasping this, the workman can draw the leaf under the iron in a reverse direction, thus cleaning the leaf in two motions. The fibre is laid at full length on the ground and the process repeated until the supply of leaves is exhausted. Men clean from 10 to 15 pounds of fibre a day, for which they receive from 2 to 2½ cents a pound.”

With some agaves the leaves are put into boiling water to wilt them, and so render the cleaning of the fibre more easy, or they are cooked and allowed to stand in water several days, when the pulpy matter is removed by rubbing them with a stick. This is sometimes done by drawing the leaves over iron spikes 8 or 9 inches long, driven into a block of wood.

The machines used in some parts of Mexico, and especially in Yucatan, for the cleaning of the fibre are simply crude scraping wheels run by steam or animal power.

BEVERAGES.

The beverages obtained from the agaves are of two kinds, fermented and distilled. The fermented drink is called “pulque,” and is universally used in Mexico, especially about the City of Mexico, which city consumes over 50,000 pints of pulque a day, and there are eight or nine hundred “pulquerias,” or “cantinas,” corresponding to our saloons, which sell nothing else.

The pulque agaves are several in number, and all have broad thick leaves. They are cultivated throughout the mountain regions and on the table-lands, particularly on the plains of Apam, a tract nearly 1,000 square miles in area, lying in the States of Mexico, Puebla and Hidalgo, about 60 miles from the City of Mexico.

When the pulque agave has reached maturity and is about to bloom, a great upward flow of sap takes place. This sap, called "aguamiel," or honey-water, is very sweet, and is much liked by the Mexicans and Indians. At this time the central bud is cut out, leaving a cavity large enough to hold a gallon or two of liquid. The sap exudes into this cavity, and is removed twice a day, being drawn out by suction into a long narrow gourd and emptied into a pigskin or clay pot. The surface of the bowl or cavity is scraped each day to increase the flow of sap, and the outer leaves are bent over and fastened together to prevent too rapid evaporation. Some plants produce an average of two gallons a day for several months.

The sap or "aguamiel" at this stage is clear green, yellowish or whitish and mucilaginous, according to the species, and rapidly ferments, becoming milky by the formation of carbonic acid. It then tastes like cider. To prevent too rapid fermentation, for in a few hours it would become vinegar, the sweet pulque is poured into a "tinacal," a square vat made of raw oxhide, and to it are added an equal amount of milk and a slight amount of liquid rennet. The pulque soon acquires a strong yeasty or cheesy odor and tastes like stale buttermilk.

The Mexicans consider pulque stomachic, an aid to digestion and sleep, and an excellent remedy in many diseases. If one can get accustomed to the odor of sour milk and slightly tainted meat, the liquor is said to be cooling, palatable and nutritious. It contains about 7 per cent. of alcohol, and when imbibed in large quantities is quite intoxicating.

The distilled drink, called "aguardiente de maguey," "mezcal," or "tequila," is a fiery liquor resembling strong rum, and is made from certain other species of agaves, called mezcal magueys, having thinner and narrower leaves. The natives of the mountain regions make their mezcal from several wild species, but the tequila maguey is cultivated in large plantations, particularly in the State of Jalisco.

The Indians of Arizona make mezcal from *Agave palmeri*.

FOOD.

Certain agaves of our Southwestern States and Territories are much prized by the Indians as food.

These have short broad leaves and are called "Mezcal," the species most highly prized being *A. palmeri*, *A. applanata parryi* and

A. Utahensis. They are prepared for food as follows: A pit is dug and lined with small smooth stones. A fire is lighted in the pit and kept burning until the stones are thoroughly heated. It is then raked out and the tender parts of the plants are piled on the hot stones and covered with grass and earth. They are then left to steam for two or three days. By this time all except the fibrous tissue is reduced to a jelly-like mass, which is sweet and nutritious.

SOAP SUBSTITUTES.

The Mexicans make use of many roots, barks and fruits called "amole," in place of soap, or for its manufacture. Dr. Rose says that the herbaceous annual-leaved agaves are called "amole" all over Mexico, and that *A. brachystachys* is the one most used. The part of the plant used is the thick, irregular root-stock. These root-stocks, when dried and grated, are put into water, forming a good lather.

Dr. Havard states that in *Agave lechuguilla* the connective tissue "constitutes about 40 per cent. of the green leaf; when dried it is a white or yellowish mucilaginous powder, which possesses remarkable cleansing properties, principally due to the presence of saponin. It imparts a smooth and satiny appearance to the skin, and is used successfully in removing stains from the most delicate fabrics."

MEDICINAL USES.

The Mexican Pharmacopœia says that "amole de raiz," or root of *Agave Mexicana*, serves for washing clothing, and the juice taken internally is diuretic, laxative and an emenagogue; while externally it is used for the itch.

The aguamiel or honey-water is also officinal, and is recommended as an anti-scorbutic.

Pulque is believed to be an efficient remedy for Bright's disease.

Other products of the agave are sugar, vinegar and a thick, sweet substance resembling honey, made by evaporating the fresh sap.

CULTIVATION.

The principal regions in Mexico for the cultivation of the pulque magueys are the arid limestone hills and table-lands.

The plants do not arrive at maturity until eight years old, the expense of cultivation to this time being usually calculated at about \$2, while the return is from \$7 to \$10, according to the size of the plant. The young plants used in planting a pulque field are the suckers, which are thrown out from the mature plant on all sides and which must be removed before the flower-bud is cut out. They are placed in rows about 9 feet apart, and require very little attention until the period of flowering commences. This period is very uncertain, but in a plantation of 1,000 agaves an average of 100 plants are ready to bloom every year.

Experience is necessary to know when to cut out the flower-bud, and if this operation be performed either too early or too late, it is unsuccessful and destroys the plant. The flow of sap continues for about five months, and in that time each plant is supposed to yield from 125 to 160 gallons of liquid.

The chief drawback to the cultivation of the pulque maguey is the long period that must elapse before a new plantation can be rendered productive and the uncertainty of the time of flowering. However, the plantations, when once established, are of great value and are a continual source of income.

Except in the State of Yucatan, the fibre magueys are seldom cultivated, the natives obtaining their supply of fibre from the wild species.

In Yucatan, near Mérida, there are several plantations of large size where Henequen fibre is produced from agaves scientifically cultivated.

More than three-fourths of the agave fibre exported from Mexico comes to the United States, and only a small amount of such fibre is imported by the United States from outside of Mexico.

The following tables show the amounts exported and imported :

TOTAL AMOUNT OF AGAVE FIBRES EXPORTED FROM MEXICO.

	1897.		1898.	
	Kilos.	Value in Pesos.	Kilos.	Value in Pesos.
Ixtle or Tampico	9,165,477	812,974	6,959,511	616,650
Henequen, Sisal	71,091,697	7,433,866	75,244,863	11,588,572

TOTAL AMOUNT OF AGAVE FIBRES IMPORTED BY THE UNITED STATES.

	Year Ending June 30, 1898.		Year Ending June 30, 1899.	
	Tons.	Value.	Tons.	Value.
Ixtle or Tampico	2,563	\$130,294	4,419	\$274,811
Henequen, Sisal	69,322	5,171,623	71,898	9,211,337

AGAVE FIBRES IMPORTED BY THE UNITED STATES FROM MEXICO.

	1897.		1898.	
	Tons.	Value.	Tons.	Value.
Ixtle or Tampico	6,312	\$335,749	2,559	\$130,055
Henequen, Sisal	62,839	3,809,415	68,432	5,104,228

PHILADELPHIA MUSEUMS.

SOME OF THE UNPUBLISHED RESULTS OF THE INVESTIGATION OF THE TANNINS BY THE LATE PROFESSOR HENRY TRIMBLE.

COMPILED FOR PUBLICATION BY JOSIAH C. PEACOCK.

In presenting the matter which is to be published under this heading, some explanatory remarks will be appropriate. When Professor Trimble died, in August of 1898, he had in his possession the results of a great many estimations of tannin which had not been published. It was the intention of Professor Trimble to bring out some of these results in a connected and logical manner in future volumes of his work "The Tannins," and for this reason many of the results which could have been published several years ago were withheld. These results represent a considerable expenditure of time, care and work in procuring material and making the determinations, and it is believed they will prove of interest to those studying the subject of tannin or tannin-bearing plants. For these reasons it has been decided to publish such of these results as could be clearly stated. The results are grouped according to the order of plants from which the material was obtained, and the groupings are arranged alphabetically as to natural order.

In compiling these results for publication, the writer has not added to the results, nor attempted to draw conclusions from them; he simply presents the results and remarks on the materials as gathered from Professor Trimble's note-books. Under the circumstances of the case, this is thought to be best.

The writer was assistant to Professor Trimble for nine years, and he would like to assure every one, who aided Professor Trimble in any way connected with the materials upon which these results were obtained, of the sincere appreciation in which this aid was held by him. When known, the names of those persons who supplied Professor Trimble with material are mentioned in connection with the estimation of the material furnished.

The following persons assisted Professor Trimble in the chemical work: Calvin O. Kinzey, Griffith H. Maghee, Josiah C. Peacock, William E. Ridenour and Florence Yapple, and, since he had expressed his thanks to each of them in published papers upon other subjects, it is believed he would have recognized their services in connection with the topics now under consideration.

The hide powder method of estimation was used throughout the work.

Anacardiaceæ.—This section deals with the more commonly used species of sumach and a material known as ron ron.

Rhus Typhina.—The materials for this work were collected at Belmont, near Philadelphia, in 1894. The estimations were made immediately after the collections.

Part.	Date of Collection.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.	Remarks.
Root bark . .	June 23	67'07	8'86	7'74	
" . .	July 9	53'42	8'99	11'27	
" . .	Aug. 16	39'74	6'07	8'56	Leaves turning in color.
" . .	Sept. 16	11'53	6'97	7'41	{ Color of leaves not completely turned.
" . .	Oct. 16	49'56	9'69	1'86	{ Leaves completely turned in color.
" . .	" 28	21'92	10'11	1'46	
Whole bark } of stem . }	June 7	32'84	3'30	4'39	
Inner bark } of stem . }	July 9	31'95	5'55	10'72	
Inner bark } of stem . }	Aug. 16	42'75	5'57	11'78	Leaves are turning in color.
Inner bark } of stem . }	Sept. 16	9'97	—	5'22	{ Leaves are not completely turned in color.
Inner bark } of stem . }	Oct. 16	31'53	6'47	3'82	{ Leaves are completely turned in color.
Wood	June 7	12'11	0'64	1'30	
Leaves	" 7	58'22	4'54	22'49	
"	July 9	56'36	7'58	28'64	Bushes not blooming this year.
"	" 9	53'81	7'05	24'35	Bushes blooming this year.
"	Aug. 16	32'97	9'45	22'15	Turning color.
"	Sept. 16	8'47	7'89	17'41	{ Not completely turned in color.
"	Oct. 16	10'12	8'41	22'91	Completely turned in color.
Stem of } Leaves . }	June 7	53'17	4'48	2'34	
Fruit	July 13	26'68	3'32	12'13	Quite hairy.
"	Aug. 16	11'17	3'42	14'41	Fully developed.
"	Sept. 16	8'92	3'79	9'88	{ Leaves not completely turned in color.

The tannin was isolated from some of the leaves and stem bark. It showed the following composition:

	Leaves.	Stem Bark.	Gallotannic Acid.
Carbon	52'08	51'86	52'17
Hydrogen	3'89	3'87	3'10
Oxygen	44'03	44'27	44'73

Rhus Glabra.—The materials for the following estimations were collected in 1894, at which time the estimations were made.

Part.	Date of Collection.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.	Remarks.
Bark of root .	June 23	63'85	5'58	3'59	Collected at Belmont, Pa.
" .	July 9	57'44	6'82	7'98	"
" .	Aug. 16	49'30	6'80	7'71	"
" .	Sept. 16	8'88	6'66	5'15	"
" .	Oct. 16	41'91	6'28	3'56	"
" .	Jan. 12, '95	9'76	7'00	3'15	Collected at St. David's, Pa.
Bark of stem,	July 9	49'23	5'49	11'03	Collected at Belmont, Pa.
"	Aug. 16	30'70	5'70	10'99	
"	Sept. 16	8'28	4'07	4'47	
"	Oct. 16	16'66	5'72	3'59	
Leaves . . .	June 2	41'29	3'62	13'83	Collected at St. David's, Pa.
" . . .	" 17	55'72	4'20	26'72	{ St. David's. Collected in evening.
" . . .	" 18	61'75	4'40	27'06	{ Collected in morning from same bush as second sample.
" . . .	" 18	52'30	3'79	28'61	{ Collected from different bushes at St. David's.
" . . .	" 23	8'78	5'80	20'39	Received from Virginia.
" . . .	July 13	25'18	5'44	28'00	{ St. David's. Not blooming this year.
" . . .	" 13	42'11	5'13	26'60	{ St. David's. Blooming this year.
" . . .	"	39'29	4'62	40'52	{ Fresh leaves from North Carolina.
" . . .	" *	13'58	4'60	40'15	{ Cured leaves from North Carolina.
" . . .	Aug. 16	26'24	6'02	24'94	{ Belmont, Pa. Leaves are changing color.
" . . .	Sept. 16	7'72	6'03	24'27	{ Belmont, Pa. Leaves have all changed color.
" . . .	Oct. 16	37'70	7'08	28'89	{ Belmont, Pa. Leaves have all turned deep red.
Flower . . .	July 23	38'08	6'52	30'36	Collected at St. David's.
Berries . . .	" 13	35'46	3'88	15'57	{ Formed, but not hairy. Belmont.
" . . .	Aug. 16	11'45	2'62	13'89	Collected at Belmont.
" . . .	Sept 16	9'59	3'03	9'78	"

* Date of estimation.

Galls of Rhus Glabra.—A number of these galls were found on August 25, 1892, in the vicinity of Wayne, Pa. A sample sent to the Department of Agriculture, Division of Entomology, at Washington, was pronounced by Acting Entomologist L. O. Howard as

produced by *Pemphigus rhois*, Fitch. It "is one of the plant-louse galls."

The tannin was isolated from some of these galls. It gave the qualitative reactions of gallotannic acid, and upon ultimate analysis showed the same centesimal composition as that substance.

Rhus Copallina.—Unless otherwise specified the materials of this member were collected at Belmont, near Philadelphia, in 1894. The estimations made on the freshly gathered materials showed the following figures:

Part.	Date of Collection.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.	Remarks.
Bark of root .	July 9	50'53	4'00	13'94	
" .	Aug. 16	50'03	4'66	14'84	Bush did not fruit this year.
" .	Sept. 16	35'06	6'12	8'62	{ Leaves mostly changed in color.
" .	Oct. 16	49'03	5'94	8'24	Leaves deep red in color.
Inner bark of stem . }	July 13	30'32	7'36	10'69	{ Collected just before the bush bloomed.
Inner bark of stem . }	Aug. 16	37'57	5'17	11'61	{ Leaves beginning to turn. Did not fruit this year.
Inner bark of stem . }	Sept. 16	11'09	5'97	6 04	Leaves mostly turned.
Leaves . . .	June 4	42'72	3'52	23'37	Collected at St. David's, Pa.
" . . .	" 23	8'74	4'16	26'18	Collected in Virginia.
" . . .	July 9	52'43	3'59	29'32	Collected at Belmont, Pa.
" . . .	"	41'00	3'62	33'90	{ Fresh leaves gathered in North Carolina.
" . . .	"	9'36	3'18	33'28	{ Same lot of leaves after "curing."
" . . .	" 24	56'44	3'37	42'51	{ Belmont, Pa. Bushes in bloom.
" . . .	Aug. 10	12'39	5'37	17'74	{ Collected at Asbury Park, N. J.
" . . .	" 16	23'98	4'40	33'28	{ Belmont, Pa. Beginning to change color.
" . . .	Sept. 10	7'64	5'27	20'24	{ Collected at Asbury Park, N. J.
" . . .	" 16	9'12	5'66	29'49	{ Belmont, Pa. Mostly changed in color.
" . . .	Oct. 16	10'04	5'74	32'39	{ Belmont, Pa. All deep red in color.
Flower . . .	July 13	43'71	3'64	48'85	Collected just before opening.

Rhus Semialata and *Rhus Canadensis*.—The examination of some material from these species showed the following quantities:

Species.	Part.	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
R. semialata	Leaves	5.98	7.26	2.77
R. semialata	Root bark	6.23	12.00	7.40
R. canadensis	Leaves	10.55	7.75	21.62

The leaves of the *R. canadensis* were collected in Tennessee in August, 1894. The purified tannin of the leaves showed:

	Per Cent.
Carbon	52.81
Hydrogen	3.17
Oxygen	44.02

It was noticed during the work on the lines of these several species of sumach that malic acid and acid malates interfere in the hide-powder process of estimating tannin by being taken up by the hide, thus immersing the figure for tannin. Neutral malates are not so absorbed, and were found to cause no interference in this manner.

Tannin of Ron Ron.—This material was procured from the Commercial Museum of Philadelphia. It is said to be the wood of a member of the Anacardiaceæ, which grows in Costa Rica.

The wood contained 6.87 per cent. of moisture, and upon ignition left an ash containing potassium and calcium carbonates and phosphates. The ash amounted to 1.58 per cent. of the thoroughly dried wood. The tannin of Ron Ron gave a yellow precipitate with bromine water, and a dark green precipitate with ferric alum. These characters ally it to the members of the oak bark tannin group. The air-dry wood contained 6.32 per cent. of tannin, which calculated for the absolutely dry wood equals 6.78 per cent.

CONIFERÆ.

Chamæcyparis Spheroidea.—A sample of the bark of the white cedar, *Chamæcyparis spheroidea*, was estimated, with the following result:

	Per Cent.
Moisture	34.75
Ash in absolutely dry bark	2.88
Tannin in absolutely dry bark	4.44

The sample was collected near Haddonfield, N. J., on June 21, 1894.

Taxodium Distichum.—A sample of the bark of *Taxodium distichum* was collected on June 28, 1895, at the Painter Arboretum,

situated about three to four miles northwest of Media, Pa. The bark was taken from the "knees;" it peeled easily. An estimation revealed the following quantities:

	Per Cent.
Moisture	13.17
Ash in absolutely dry bark	4.20
Tannin in absolutely dry bark	10.45

Juniperus Communis.—A nursery sample of *Juniperus communis* obtained near Philadelphia on March 15, 1896, showed the following percentages of tannin:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	5.97	6.77	7.71
Stem bark	5.95	6.49	5.66
Leaves	6.21	4.18	4.18

The ashes of the barks contained potassium and calcium as carbonates, phosphates and sulphates; the ashes of the leaves were free from sulphates, but in other respects they were the same as those from the barks.

Juniperus Virginiana.—The following collections of the stem bark of *Juniperus virginiana* were made at St. David's, Pa.

Date of Collection.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.	Remarks.
May 12, 1894	5.50	5.30	5.60	
June 17, 1894	8.64	6.30	7.30	
July 29, 1894	25.28	6.86	8.28	
August 28, 1894	25.27	7.48	8.59	
October 3, 1894	8.24	4.06	3.59	Inner bark.
December 3, 1894	11.10	9.90	3.93	
January 14, 1895	9.00	9.78	3.56	
February 25, 1895	7.51	7.57	2.05	

The purified tannin of this bark gave the qualitative reactions of oak-tannin, and showed a composition of:

	Per Cent.
Carbon	60.87
Hydrogen	5.47
Oxygen	33.66

Larix Americana.—On August 15, 1895, Professor Bastin gathered

some bark from the branches of a *Larix americana*, growing in the Adirondack Mountains, New York. This was examined and found to yield 9.37 per cent. of moisture; 2.56 per cent. of ash in absolutely dry bark; and 13.98 per cent. of tannin in the thoroughly dried material.

A sample of bark collected from the branches by Professor Trimble at St. David's, Pa., on July 29, 1895, showed moisture, 13.05; ash in absolutely dry bark, 2.78, and tannin in absolutely dry bark, 8.79 per cent.

A nursery sample of the tree estimated in March, 1896, gave the following results:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	8.81	4.11	15.50
Stem bark	7.47	2.51	12.48
Leaves	6.51	5.73	8.89

Larix Europea.—Some bark of *Larix europea* was collected from the stem of a tree at St. David's, Pa., on January 30, 1896. It showed the following:

	Per Cent.
Moisture	5.75
Ash in absolutely dry bark	2.39
Tannin in absolutely dry bark	15.91

Pseudotsuga Taxifolia.—Two samples of the bark of *Pseudotsuga taxifolia* were estimated. One of these samples was from Klamath Falls, Ore., and the other from Forest Grove, in the same State. The former was collected about the first of January, 1897, and the latter on February 13, 1895. The results were as follows:

Sample.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Klamath Falls	15.41	1.06	8.15
Forest Grove	5.34	1.49	14.05

The purified tannin from one of the samples gave the following figures when submitted to combustion:

	Per Cent.
Carbon	61.72
Hydrogen	5.73
Oxygen	32.55

Pinus Ponderosa.—Two samples of the bark of *Pinus ponderosa*, one from Klamath Falls, Ore., and the other from Colorado Springs

Col., were estimated. The first was collected in December, 1896, and the second in February, 1896. The figures were :

Sample.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Klamath Falls	12.04	0.91	4.20
Colorado Springs	7.65	4.56	4.49

Taxus Canadensis.—Two samples of bark from *Taxus canadensis* were examined. One sample was collected at Perkiomen, Pa., on August 1, 1895, the other was gathered in the Adirondack Mountains, N. Y., on August 15, 1895. The results were :

Locality.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Perkiomen	10.86	5.64	20.46
Adirondack	10.63	5.23	17.01

Thuja Gigantea and Thuja Occidentalis.—For the purpose of estimating the tannin in these trees, specimens were procured from a nursery near Philadelphia, on March 15, 1896. The results were as follows for *Thuja gigantea* :

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	6.70	5.14	10.71
Stem bark	6.93	6.10	8.16
Leaves	8.23	3.91	9.14

and for *Thuja occidentalis* :

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	6.44	7.12	5.77
Stem bark	5.61	6.46	6.13
Leaves	7.68	4.89	5.85

The ashes of the leaves were composed of potassium and calcium carbonates and phosphates; those of the barks contained the same salts and, in addition, sulphates.

(To be continued.)

NICOTINE may be detected by the use of formaldehyde (30 per cent. solution) and concentrated sulphuric acid. A rose-red colored solution is produced with 0.005 gramme of the alkaloid.—*Pharm. Centralh.*, 1899, p. 703.

ON THE REPORTED PRODUCTION OF ARSENIC FROM PHOSPHORUS AND THE COMPOUND NATURE OF THE FORMER.

NOTE BY SAML. P. SADTLER, PH.D.

The announcement by Prof. F. Fittica, of Marburg, the well-known editor of the *Fabresbericht*, that he had succeeded in changing both the clear and the amorphous varieties of phosphorus into arsenic by following certain lines of treatment comes with something of a surprise to chemists.

Already near the beginning of this century the observation was made that, under the influence of ammonia, phosphorus, whether on exposure to light or when in the molten condition, passed into a so-called black modification, and in 1892 Flückiger showed that this was arsenic and nothing else. However, it was assumed that the arsenic had existed in the phosphorus as an impurity, and had merely separated out under this treatment.

The author soon found, on repeating the earlier experiments, that atmospheric oxidation was an essential part of the process yielding the result noted, and he then began the treatment of the phosphorus with ammonia in the presence of stronger oxidizing agents like hydrogen dioxide and with nitric acid alone and in conjunction with barium dioxide. Amorphous phosphorus was found to give better results than the clear variety.

The method finally chosen by which he succeeded in obtaining the maximum yield (8-10 per cent.) was the following: 2 grammes of amorphous phosphorus, free from arsenic, were heated on the sand bath with 12.9 grammes of finely powdered ammonium nitrate after being carefully mixed in a rather wide tube connected with a condenser, and the temperature gradually raised to 180° C. When the reaction begins care must be taken to moderate the heat, which, however, rises to about 200°. After allowing to cool, the contents of the tube, a fused grayish mass, are dissolved out, and, after filtering, hydrogen sulphide added. The yellow precipitate is dissolved in ammonium carbonate and the arsenic sulphide precipitated from the solution on addition of hydrochloric acid. Its identity is established by its conversion into arsenious acid and by Marsh's test.

The author gives a *provisional formula for arsenic*, PN_2O , according to which it is a nitrogen monoxide compound of phosphorus. Further communications are promised.

Prof. Clemens Winkler, of Freiburg, Saxony, publishes in the *Berichte der Deutschen Gesellschaft* for June 11th, which is just at hand, a review of Fittica's experiments and shows quite conclusively that the arsenic found is simply a constant impurity of the phosphorus, and, in four experiments, using different oxidizing agents, he gets 1.91, 1.925, 1.920 and 1.920 per cent. of arsenic. This uniformity, to his mind, shows the exact extent of the arsenic impurity originally present in the phosphorus used. So we still have to consider arsenic as an element.

RECENT LITERATURE RELATING TO PHARMACY.

PERIODIDE SEPARATION IN ALKALOIDAL ASSAY.

While Gordon and Prescott suggest a volumetric estimation of alkaloids through their periodides, Kippenberger (*Ap. Zeit.*, through *Ph. Cent.*, 1898, 903) has devised an assay wherein the alkaloids are separated as periodides and weighed free. His method is as follows: The preparation, freed from alcohol, is treated with an iodine solution (20 grammes iodine and 60 grammes potassium iodide to the litre), and the precipitate collected on a filter. This is washed with water (best containing a little sodium chloride, to avoid loss of the slightly soluble periodide), after which the precipitate is extracted with rectified acetone, the filtrate dropping into a funnel and repeatedly poured back over the precipitate.

The acetone solution of the periodide is shaken with an alkaline hydrate solution (which takes up the iodine), and then free hydrochloric acid is added in excess, and finally water is added. The mixed liquid is then shaken with petroleum ether, which extracts coloring matter, last traces of iodine and a large part of the acetone, and this mixture is separated from the aqueous layer, which is then freed from the remaining acetone by heating on a water-bath. Thereupon it is returned to the separatory funnel, diluted with water and made alkaline, and the free alkaloid extracted with chloroform.

The author claims that this method, which appears complicated and subject to error, gives good results. The article gives special directions for the preparation of each drug, for which the reader is referred to the original.

H. V. A.

ASSAY OF BISMUTH SALICYLATE.

W. Kollo (*Ph. Post*, 1899, 2) has applied Thom's method (See A. J. P., 1899) of bismuth estimation to the salicylate, with satisfactory results, using for control experiment the extraction of the salicylic acid from the substance; as well as the separated weight of the bismuth oxide. He calls attention to an error in the usual directions of manufacture of the salicylate—that the precipitated salt be washed with water until the filtrate no longer gives a reaction with ferric chloride. This direction is, of course, intended to totally remove the free salicylic acid; but as traces of bismuth salicylate dissolve in the wash-water, it always gives the reaction with iron. He amends the directions to read that the *ethereal extract* of the last washings should not show the ferric chloride reaction. H. V. A.

INDIRECT QUANTITATIVE ESTIMATION OF ALKALINE EARTHS.

Noting the difficulty in the quantitative separation of calcium, strontium and barium, Knoblauch (*Ph. Zeit.*, 1898, 922) devised a simple indirect method of estimation of any two of these elements based on the molecular weights of their oxides and carbonates. The process, briefly outlined, consists in the precipitation of the mixed elements as carbonates, and the conversion of these by heating with a given weight of borax glass. The weight of the mixed carbonates is the factor p; that of the oxides, the factor n, and the differential equations are as follows:

Calcium and barium:

$$\begin{aligned} \text{CaO} &= 2.00652915 p - 2.58283141 n. \\ \text{BaO} &= n - \text{CaO}. \end{aligned}$$

Calcium and strontium:

$$\text{CaO} = 2.7736936 p - 3.95263432 n. \quad \text{SrO} = n - \text{CaO}.$$

Barium and strontium:

$$\text{SrO} = 7.25463260 p - 9.33816773 n. \quad \text{BaO} = n - \text{SrO}.$$

As the matter is of analytical rather than pharmaceutical interest, the reader is referred to the original for details, as well as for the author's method of estimation, when all three elements are present.

H. V. A.

BISMUTUM OR BIMUSTHUM?

In defense of the orthography of the German pharmacopœial term bismutum, T. Husemann (*Ph. Zeit.*, 1898, 895) gives a highly inter-

esting sketch of the etymology of the word, in which he lays special stress on the fact that the word is of German-Latin origin and that to these two languages the combination "th" is foreign. His authorities may be outlined as follows:

Unknown author, "Berg büchlein"	1518-1539	Wissmath.
" " "Ursprung von Bergrecht"	1532	Wissmat.
Georg Agricola	{ 1539	Bisemutum.
	1546	Bismut.
Encelius	1551	{ Wisemut.
		Wyssmut.
		Wyssmuth.
Keatmann	1565	{ Wissmut.
		Wismut.
Fabricius	1565	{ Bismuth.
		Wismuth.
Libavius	1597	Bismuthum.
Ruland	1612	Wissmat.
Schroeder's Pharmacopœia	1641	{ Bismuthum.
		Bisemutum.
Reprint of Valentinus	1677	{ Wissmut.
		Wismuht.
"Museum Wormianum"	1694	Wissmut.
"Bergwerks Lexicon"	1743	Wismuth.
Linné	1787	{ Wismuthum.
		Vismuthum.

The English word has been "bismuth" since earliest reference (1715). The French have used "bismuth" and "bismut," the former being the earliest in notice (1694). The supposed derivation of the word from "wiese-matie" is characterized as a pretty fable, the real origin not being known.

H. V. A.

VALUATION OF INSECT POWDER.

The most plausible methods of valuation of the commodity are based on amount, appearance and odor of the extract afforded by percolation with ether, chloroform or petroleum ether.

F. Dietze (*Ph. Zt.*, 1899, 196) makes a comparison of the several methods, and has decided that the best results are secured by the use of petroleum ether, boiling under 55° C. The percolate from pure insect powder, when such menstruum is employed, is bright yellow, and possesses the peculiar odor of the powder. The writer further urges that all valuations should be accompanied by physiological tests on the insects themselves.

H. V. A.

PARAGUAY TEA.

The leaves of *Ilex paraguayensis* are the subject of an interesting paper by P. Seidler (*Süddtsch. Ap. Zeit.*, 1898, 724).

He states that the tea industry is conducted by companies, the largest being an English concern, which has a capital of 5,000,000 sterling.

The product is obtained from wild plants, which are evergreen, and sometimes 25 feet high, growing on tracts obtained by governmental concession. The collection is from May to September, and is performed by Indians directed by white overseers.

The various grades are: (1) The leaves of young shoots; (2) leaves from branches of preceding year; (3) leaves of old branches dried over a fire. In packing all three varieties, some branches are added to give the drink a slight astringency.

The physiological effect of the infusion, which is called *mate*, not *maté* (from utensil in which prepared), is similar to tea or coffee, without affecting the digestion as they do. H. V. A.

THE CELLULAR TISSUE OF GENTIAN.

The researches of Bourquelot and Hérissey, on Gentian, have reached the cellular membrane. The authors report (*Four. de Pharm. et Chim.*, 1899, 330) that the drug, after exhaustion with hot water, boiling alcohol and sulphuric acid heated to boiling, leaves a residue, which represents almost pure cellulose. This is susceptible to hydrolysis, when 25 grammes are macerated with 125 grammes sulphuric acid and 40 grammes distilled water for twenty-four hours. The liquid is then diluted to 1,000 c.c. and filtered, the filtrate washed with 2½ per cent. sulphuric acid until filtrate measures 5,000 c.c., is then neutralized with calcium carbonate, condensed to 400 c.c. and then filtered to removed calcium sulphate. This filtrate is evaporated to a syrup and crystallized with aid of alcohol. The product on purification with alcohol shows all the characteristics of dextrose. H. V. A.

THE VARIATION IN THE COMPOSITION OF "PARIS GREEN," WITH SCHEME FOR ANALYSIS.

Thomas B. Stillman, in concluding a paper (*Chem. News*, 1899, p. 261) on the chemical examination of Paris green, gives a number of important references to the literature of the subject, and gives the accompanying scheme of analysis, which includes all varieties of Schweinfurth green.

SCHEME FOR ANALYSIS OF "PARIS GREEN," CONTAINING BaSO₄, PbSO₄, 3CuAsO₃Cu(C₂H₃O₂)₂, PbCrO₄, ZnO, and CaCO₃.
 Add Excess of Dilute Nitric Acid, Warm, Filter and Wash Well with Hot Water.

<p><i>Residue</i> { BaSO₄, PbSO₄.</p> <p>Transfer to a No. 3 beaker, add excess of a saturated solution of ammoniac acetate; warm ten minutes, filter, wash with hot water.</p>	<p><i>Solution.</i></p> <p>Add excess of dilute H₂SO₄, evaporate nearly to dryness, allow to cool, add dilute H₂SO₄, warm, filter and wash well with water.</p>	<p><i>Solution.</i>—Pass H₂S gas through the liquid to saturation, keeping the temperature of the solution at about 70° C. Filter, wash with water containing H₂S.</p>	<p><i>Solution.</i>—Boil to expel the H₂S, make alkaline with ammoniac hydrate (a), warm, filter, wash well with hot water.</p>	<p><i>Solution.</i>—Pass H₂S gas to saturation, filter, wash with water containing a few drops of ammoniac sulphide.</p>
<p><i>Residue,</i> PbSO₄.</p> <p>Dry, ignite and weigh as PbSO₄, and calculate to PbCrO₄.</p>	<p><i>Residue,</i> As₂O₃.</p> <p>Transfer to a No. 3 beaker, add excess of strong solution of sodium sulphide, warm gently ten minutes, filter, wash with water.</p>	<p><i>Residue,</i> CuS</p> <p>Acidify with HCl, pass H₂S gas to saturation, filter, wash with H₂O, and determine arsenic by method of Kessler. (See "Sutton's Volumetric Analysis," p. 138.)</p>	<p><i>Residue,</i> ZnS.</p> <p>Dissolve precipitate in HCl, dilute with water, boil, add gradually slight excess of sodium carbonate; boil three minutes, filter, wash thoroughly with hot water, dry, ignite, and weigh as ZnO.</p>	<p><i>Residue,</i> ZnS.</p> <p>Dissolve precipitate in HCl, dilute with water, boil, add gradually slight excess of sodium carbonate; boil three minutes, filter, wash thoroughly with hot water, dry, ignite, and weigh as ZnO.</p>
<p><i>Residue,</i> Cr₂(OH)₆.</p> <p>Dry, ignite and weigh as Cr₂O₃. Calculate to—</p>	<p><i>Residue,</i> PbCrO₄.</p> <p>This weight should equal the weight of PbCrO₄ found by determination of the lead in Column 3.</p>	<p><i>Residue.</i> CuS.</p> <p>Dissolve in nitric acid, dilute with water, filter off any separated sulphur, and determine copper by electrolysis. (See "Stillman's Engineering Chemistry," p. 5.)</p>	<p><i>Residue,</i> PbCrO₄.</p>	<p><i>Residue,</i> CaCO₃.</p>
<p><i>Residue,</i> BaSO₄.</p> <p>Dry, ignite and weigh as BaSO₄.</p>	<p><i>Residue,</i> PbCrO₄.</p>	<p><i>Residue,</i> Cu.</p>	<p><i>Residue,</i> PbCrO₄.</p>	<p><i>Residue,</i> CaCO₃.</p>

(a) If a white precipitate forms, of zinc hydroxide, add ammoniac hydrate until it dissolves. If it be desired to determine the acetic acid, another portion of the Paris green should be taken and tested by C. Mohr's process. (Consult page 82, "Sutton's Volumetric Analysis.")

PHILADELPHIA HOSPITAL FORMULARY.

(Continued from page 234.)

Mistura Camphoræ.

Each tablespoonful contains :

Tr. Opium, Deod.,	5 m.	0'3 c.c.
Acid, Nitrous, Fuming	4 m.	0'24 c.c.
Water, Camphor, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Hope.

Mistura Cardiaca.

Each teaspoonful contains :

Solution, Nitro-glycerin (1 per cent.)	1 m.	0'06 c.c.
Tr. Belladonna	1 m.	0'06 c.c.
Tr. Digitalis	5 m.	0'3 c.c.
Tr. Strophanthus	2 m.	0'12 c.c.
Water, Chloroform, to measure	1 fl. dr.	4 c.c.

Dose : Teaspoonful.

J. M. DaCosta.

Mistura Cascara.

Each teaspoonful contains :

Ext. Cascara Sag., Fl.,		
Inf. Sarsap., Comp.,		
Glycerin, of each	20 m.	1'25 c.c.

Dose : One teaspoonful or more, in water.

Mistura Codeinæ et Chloroformi.

(C—C. Mixture.)

Each teaspoonful contains :

Codeine Sulphate	1/8 gr.	0'008 gm.
Acid, Hydrocyanic, Dilute	1'5 m.	0'1 c.c.
Spts. Chloroform	15 m.	1 c.c.
Glycerin	10 m.	0'65 c.c.
Ext. Wild Cherry, Fl.,	5 m.	0'3 c.c.
Elixir, Orange, to measure	60 m.	4 c.c.

Dose : Teaspoonful, in water.

J. W. E.

Mistura Creosoti.

Each dessertspoonful contains :

Creosote, B. W.	2 m.	0'12 c.c.
Glycerin	30 m.	2 c.c.
Elixir, Orange	30 m.	2 c.c.
Alcohol	30 m.	2 c.c.
Oil, Almonds, Bitter	1 drop.	0'03 c.c.
Tr. Cardamom, Comp., to measure	2 fl. dr.	8 c.c.

Dose : Two to four teaspoonfuls 3 to 5 times a day.

Mistura Diuretica.

Each dessertspoonful contains :

Potass. Citrate	10 gr.	0·6 gm.
Potass. Acetate	10 gr.	0·6 gm.
Spts. Ether, Nitrous	15 m.	1 c.c.
Sol. Ammon. Acet.	1 fl. dr.	4 c.c.
Syrup, Acid, Citric, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful.

Mistura Diuretica Cum Digitale.

Each dessertspoonful contains :

Potass. Citrate	10 gr.	0·6 gm.
Potass. Acet.	10 gr.	0·6 gm.
Spts. Ether, Nit.	15 m.	1 c.c.
Sol., Ammon., Acet.	1 fl. dr.	4 c.c.
Tr. Digitalis	5 m.	0·3 c.c.
Syrup, Acid, Citric, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful.

Mistura Dysenterica.

(Saline Dysenteric Mixture.)

Each dessertspoonful contains :

Magnes. Sulph.	20 gr.	1·3 gm.
Ac. Sulph. Dil.	10 m.	0·6 c.c.
Tr. Opium, Deod.	10 m.	0·6 c.c.
Water, Chloroform, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful.

Mistura Enterica.

Each teaspoonful contains :

Chloroform ²	5 m.	0·3 c.c.
Tr. Capsicum	5 m.	0·3 c.c.
Ac. Sulphuric, Aromat.	10 m.	0·6 c.c.
Spts. Camphor	10 m.	0·6 c.c.
Tr. Opium, Deod.	10 m.	0·6 c.c.
Spts. Wine, Gallic, to measure	1 fl. dr.	4 c.c.

Dose : One teaspoonful.

Mistura Expectorans.

Each dessertspoonful contains :

Acid, Hydrocyanic, Dil.	1 m.	0·06 c.c.
Spts. Chloroform	10 m.	0·6 c.c.
Acid, Hydrobromic (34 per cent.)	7·5 m.	0·5 c.c.
Syrup, Senega	10 m.	0·6 c.c.
Syrup, Squill	15 m.	1 c.c.
Syrup, Wild Cherry, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful.

Mistura Ferri Aperiens.

Each tablespoonful contains :

Ferrous Sulphate	1 gr.	0.65 gm.
Magnesium Sulphate	60 gr.	4 gm.
Acid, Sulphuric, Dil.	7.5 m.	0.5 c.c.
Syrup, Ginger	1 fl. dr.	4 c.c.
Inf. Quassia, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Mistura Ferri et Ammonii Acetatis.

(Basham's Mixture.)

Each tablespoonful contains :

Tr. Ferric Chloride	10 m.	0.6 c.c.
Acid, Acetic, Dilute	15 m.	1 c.c.
Sol. Ammonium Acetate	2 fl. dr.	8 c.c.
Elixir, Orange	30 m.	2 c.c.
Glycerin	30 m.	2 c.c.
Water, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Philadelphia Hospital.

P. S.—Under the name, at first, of “*Mistura Ferri Chloridi Composita*,” the above formula, in its essential ingredients, has been used in the Philadelphia Hospital since 1875, and possibly earlier. It is thought to be the original formula of Dr. W. K. Basham, of Westminster Hospital, London, and differs radically from the watery product of the U. S. Pharmacopœia of 1890 (*Liquor Ferri et Ammonii Acetatis*), which represents, in each tablespoonful, only about 5 minims of Tincture of Ferric Chloride, and 48 minims of Solution of Ammonium Acetate.

Mistura Ferri Salicylatis.

Each teaspoonful contains :

Sodium Salicylate	7.5 gr.	0.5 gm.
Glycerin	15 m.	1 c.c.
Mucilage, Acacia	7.5 m.	0.5 c.c.
Tr. Ferric Chlor.	7.5 m.	0.5 c.c.
Oil, Gaultheria	½ m.	0.03 c.c.
Solution, Ammonium, Citrate (B.P.), to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

S. Solis Cohen.

Mistura Ferri Phosphatis.

(Iron Lemonade.)

Each teaspoonful contains :

Tr. Ferric Chloride	10 m.	0.6 c.c.
Acid, Phosphoric, Dilute	10 m.	0.6 c.c.
Glycerin	15 m.	1 c.c.
Syrup, Acid, Citric, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Mist. Ferri et Potass. Chloratis.

(Iron Gargle.)

Tr. Ferric Chloride	2 fl. dr.	8 c.c.
Acid, Acetic	15 m.	1°c.c.
Sol. Ammon. Acet.	4 fl. dr.	15 c.c.
Sol. Potass. Chlorate, Sat.	4 fl. oz.	120 c.c.
Glycerin	3 fl. dr.	12 c.c.
Water, Peppermint, to measure	8 fl. oz.	240 c.c.

Gargle.

Mist. Ferri et Quininæ Phosphatis.

Each tablespoonful contains :

Quinine Sulphate	2·5 gr.	0·15 gm.
Acid, Phosphoric, Dil., sufficient.		
Iron Pyrophos. Sol.	2·5 gr.	0·15 gm.
Glycerin	30 m.	2 c.c.
Elixir; Orange	1 fl. dr.	4 c.c.
Sol. Ammon. Acet., sufficient.		
Water, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Mistura Gentianæ Acida.

Each tablespoonful contains :

Acid, Nitrohydrochloric, Dilute	10 m.	0·6 c.c.
Inf. Gentian, Co., to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Mistura Nucis Acida.

(Acid Nux Mixture.)

Each teaspoonful contains :

Acid, Hydrochloric, Dilute	10 m.	0·6 c.c.
Tr. Nux Vomica	10 m.	0·6 c.c.
Tr. Pepper, Black	5 m.	0·3 c.c.
Glycerin	5 m.	0·3 c.c.
Inf. Gent., Comp., to measure	1 fl. dr.	4 c.c.

Dose : Teaspoonful.

Mistura Pectoralis.

Each dessertspoonful contains :

Ammonium Chloride	5 gr.	0·3 gm.
Spts. Ammon., Aromat.	2 m.	0·12 c.c.
Syr. Senega	10 m.	0·6 c.c.
Mixt. Liquorice, Comp., to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful to tablespoonful.

Mistura Pepsinæ et Strychninæ.

Each teaspoonful contains :

Strychnine Sulph.	$\frac{1}{64}$ gr.	·001 gm.
Pepsin, Scaled	2·5 gr.	·015 gm.
Acid, Hydrochloric, Dilute	5 m.	0·3 c.c.
Tr. Card., Comp.	10 m.	0·6 c.c.
Water, to measure	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

Mistura Pilocarpinæ, Sparteinæ et Digitalis.

Each dessertspoonful contains :

Pilocarpine Nitrate	1/2 gr.	0.004 gm.
Sparteine Sulphate	1/4 gr.	0.016 gm.
Water, Chloroform, Infusion, Digitalis, of each, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful.

D. E. H.

Mistura Sodæ.

(Soda Mint.)

Each tablespoonful contains :

Sodium Bicarbonate	10 gr.	0.6 gm.
Spts. Ammon., Aromat.	7.5 m.	0.5 gm.
Water, Peppermint, to measure	4 fl. dr.	15 c.c.

Dose : Tablespoonful.

Philadelphia Hospital.

Mistura Sodæ et Rhei.

Each dessertspoonful contains :

Sodium Bicarbonate	3 gr.	0.2 gm.
Tr. Capsicum	2 m.	0.12 c.c.
Tr. Nux Vomica	5 m.	0.3 c.c.
Tr. Rhubarb	30 m.	2 c.c.
Water, Peppermint, to measure	2 fl. dr.	8 c.c.

Dose : Dessertspoonful to tablespoonful.

Mistura Terebeni.

Each teaspoonful contains :

Terebene	3 m.	0.2 c.c.
Oil, Gaultheria	1 m.	0.06 c.c.
Acacia, sufficient.		
Syrup, Wild Cherry, to measure	1 fl. dr.	4 c.c.

Dose : One or two teaspoonfuls in water.

Mistura Zollickofferi.

(Zollickoffer's Mixture.)

Each tablespoonful contains :

Potassium Iodide	10 gr.	0.6 gm.
Resin, Guaiac	5 gr.	0.3 gm.
Wine, Colchicum Root	15 m.	1 c.c.
Acacia, Powder., sufficient.		
Water, Cinnamon, Syrup, Ginger, of each, to measure	4 fl. dr.	5 c.c.

Dose : Tablespoonful.

OLEA.

Oleum Carbolatum.

Acid, Carbolic	2.5 per cent.
Oil, Olive	97.5 per cent.

Philadelphia Hospital.

Oleum Lini et Calcis.

(Carron Oil.)

Oil, Linseed,
Water, Lime, of each, equal volumes.

PILULÆ.

Pilulæ Aloini, Belladonnæ et Nucis Vomica.

Each pill contains :

Aloin	$\frac{1}{8}$ gr.	0'013 gm.
Ext. Belladonna	$\frac{1}{8}$ gr.	0'008 gm.
Ext. Nux Vomica	$\frac{1}{8}$ gr.	0'008 gm.

Pilulæ Aloini, Belladonnæ et Nucis Vomica Comp.

Each pill contains :

Aloin	$\frac{1}{8}$ gr.	0'013 gm.
Ext. Belladonna	$\frac{1}{8}$ gr.	0'008 gm.
Ext. Nux Vomica	$\frac{1}{8}$ gr.	0'008 gm.
Ext. Cascara Sagrada	1 gr.	0'065 gm.

Dose : One pill.

Pilulæ Antipyreticæ.

Each pill contains :

Powd. Opium	$\frac{1}{4}$ gr.	0'016 gm.
Powd. Ipecac	$\frac{1}{4}$ gr.	0'016 gm.
Powd. Digitalis	$\frac{1}{2}$ gr.	0'032 gm.
Quinine Sulphate	1 gr.	0'065 gm.

Dose : One pill every six hours.

Niemeyer.

Pilulæ Argenti et Opii.

Each pill contains :

Silver Nitrate	$\frac{1}{8}$ gr.	0'008 gm.
Powd. Opium	1 gr.	0'065 gm.

Dose : One to two pills.

Pilulæ Arsenicales.

Each pill contains :

Acid Arsenous,	$\frac{1}{64}$ gr.	$\frac{1}{48}$ gr.	$\frac{1}{32}$ gr.	$\frac{1}{24}$ gr.
=	0'001 gm.	0'0015 gm.	0'002 gm.	0'003 gm.

Dose : One pill.

Pilulæ Arsenici et Cinchoninæ.

Each pill contains :

Acid Arsenous	$\frac{1}{24}$ gr.	0'003 gm.
Ext. Nux Vomica	$\frac{1}{4}$ gr.	0'016 gm.
Cinchonine Sulphate	2 gr.	0'13 gm.
Mass, Ferrous Carbonate	2 gr.	0'13 gm.

Dose : One pill.

Pilulæ Arsenici, Strychninæ et Ferri.

Each pill contains :

Acid Arsenous	$\frac{1}{4}$ gr.	0'003 gm.
Strychnine Sulphate	$\frac{1}{8}$ gr.	0'0015 gm.
Iron, Reduced	1 gr.	0'065 gm.

Dose : One pill.

Pilulæ Arsenici, Strychninæ et Quininæ.

Each pill contains :

Acid Arsenous	$\frac{1}{4}$ gr.	0'003 gm.
Strychnine Sulphate	$\frac{1}{8}$ gr.	0'0015 gm.
Quinine Sulphate	2 gr.	0'13 gm.

Dose : One pill.

Pilulæ Creosoti.

Each pill contains :

Creosote, Beechwood,

1 m.	2 m.
= 0'06 c.c.	0'12 c.c.

Dose : One or more pills.

Pilulæ Cupri Compositæ.

Each pill contains :

Copper Sulphate	$\frac{1}{8}$ gr.	0'008 gm.
Powd. Opium	$\frac{1}{8}$ gr.	0'008 gm.
Ext. Nux Vomica	$\frac{1}{8}$ gr.	0'008 gm.

Dose : One every three or four hours.

Pilulæ Ferri Carbonatis.

(Blaud's Pills.)

Each pill contains :

Mass, Ferrous Carbonate	3 gr.	0'2 gm.
Potass. Sulphate	2 gr.	0'13 gm.
Potass. Carbonate	$\frac{1}{8}$ gr.	0'02 gm.

Acacia,

Althæa, of each, sufficient.

Dose : One or more pills.

J. W. E.

Pil. Ferri, Quininæ et Strychninæ.

Each pill contains :

Iron Pyrophos.	1'5 gr.	0'1 gm.
Quinine Sulphate	1 gr.	0'065 gm.
Strychnine Sulphate	$\frac{1}{64}$ gr.	0'001 gm.

Dose : One to two pills.

Pilulæ Hepaticæ Compositæ.

Each pill contains :

Powd. Ipecac	$\frac{1}{8}$ gr.	0'02 gm.
P. Black Pepper	1 gr.	0'065 gm.
Sodium Bicarb.	3 gr.	0'2 gm.
Mass, Mercurial	3 gr.	0'2 gm.

Dose : One every two hours after supper until three are taken, followed in the morning, before breakfast, by a saline purgative.

J. W. E.

Pilulæ Hydrargyri Chloridi Corrosivum.

Each pill contains :

Mercuric Chloride, Corrosive,

$\frac{1}{20}$ gr.	$\frac{1}{16}$ gr.	$\frac{1}{12}$ gr.
= 0'003 gm.	0'004 gm.	0'005 gm.

Dose : One pill.

Pilulæ Hydrargyri Iodidi Flavi.

Each pill contains :

Mercurous Iodide, Yellow,

$\frac{1}{8}$ gr.	$\frac{1}{4}$ gr.	$\frac{1}{2}$ gr.
= 0'008 gm.	0'016 gm.	0'032 gm.

Dose : One pill.

Pilulæ Plumbi et Opii.

Each pill contains :

Extract, Opium	$\frac{1}{4}$ gr.	0'016 gm.
Lead Acetate	2 gr.	0'13 gm.

Dose : One to two pills.

Pilulæ Purgativæ Compositæ.

Each pill contains :

P. E. Colocynth Comp.	1'25 gr.	0'08 gm.
Mercurous Chloride, Mild	1 gr.	0'065 gm.
Ext. Jalap	$\frac{1}{2}$ gr.	0'032 gm.
Gamboge	$\frac{1}{4}$ gr.	0'016 gm.
Ext. Hyoscyamus	$\frac{1}{8}$ gr.	0'008 gm.
Oil, Peppermint	$\frac{1}{8}$ m.	0'004 c.c.

Dose : Three or four pills.

Pilulæ Quininæ.

Each pill contains :

Quinine Sulphate,

1 gr.	2 gr.	3 gr.	5 gr.
= 0'065 gm.	0'13 gm.	0'2 gm.	0'3 gm.

Dose : One pill.

Pilulæ Thymol.

Each pill contains :

Thymol	3 gr.	0'2 gm.
Powd. Soap	1'5 gr.	0'1 gm.

Dose : One pill.

EDITORIAL.

THE RETAIL PHARMACIST AND THE AMERICAN PHARMACEUTICAL
ASSOCIATION.

There are many people who look upon life as being an existence characterized for the most part by struggle and dissension. They say, for instance, that in the human body there is a struggle among the cells, and that in this struggle there are not only evidences of life, but there is life. And so in the world about us, they speak of

a struggle for a material existence, and would have us believe that in order that there be life there must be a fight continually going on. No one can deny that every organism has a struggle for existence, but no one can say that in this struggle we have the only factor that produces any lasting benefit. In the living world it is not so much strife as the proper co-ordination of the functions of the different cells and different organs in the organism which conduce to the production of the best results. In the social world every one is beginning to recognize the truth of the saying, "give and take." The capitalist recognizes that in order to produce and keep his wealth it is not only necessary for him to look carefully after his employees during their working hours, but even afterwards. The result is that in the very largest and best regulated establishments there are evidences of the proper co-ordination of all the forces—not only are the members of the firm wealthy, but the employees are also prosperous.

The same thing applies also to our various organizations. The membership is made up of those who in many cases have apparently diverse interests. And yet when we look at their actions carefully we cannot but see that they all have the interests of the association to which they belong at heart, and the most successful associations are those in which no one section suffers, but in which there is a proper co-ordination of the efforts of the various committees and workers. In a still larger sense this may also be said of the various separate organizations espousing particular fields of work, such as those interested in pharmacy, medicine, etc.

There are some persons who have criticised the A.Ph.A. as not being sufficiently scientific; whereas there are others who speak of it as an association for manufacturers and teachers; and still others who think that the retail pharmacist should be "the power behind the throne." The fact is none of these persons are justified in their claims or their criticisms. The A.Ph.A. is the one organization that ought to be sufficiently representative to include all those in any wise interested in pharmacy. It is big enough for the retail pharmacist, the manufacturer and the teacher. And it is indeed significant that this year the President and the chairmen of two sections are retail pharmacists, the chairmen of the other two sections being teachers. At the last meeting of the Association the chairmen of the different sections as well as the President of

the Association were teachers. A year ago, the President and the Chairman on Pharmaceutical Education and Legislation were manufacturing pharmacists; the Chairman of the Commercial Section was a retail pharmacist, and the Scientific Section only was represented by a teacher.

It was the President at the last meeting of the Association who said: "The interests of the wholesaler, the manufacturer, dispenser and teacher are in common;" and it was the chairman of the Commercial Section who said "unless there be a commercial side to pharmacy, the professors will soon be without students to instruct."

Surely these are not merely sentiments, for when it has come to the election of officers it has always been the desire of the members of the Association to share honors and power with every representative of legitimate modern pharmacy. In former years the retail pharmacist controlled everything, but, as was pointed out in a recent editorial in this JOURNAL, times have changed, and in this age of specialization it is not possible for any one man to be at the same time wholesaler, manufacturer, dispenser and teacher. Every one must recognize from the very nature of the case that these different divisions of pharmacy furnish distinct lines of work. Yet it will be found that ultimately their interests are in common, and hence should be represented by some one organization as the American Pharmaceutical Association. No one class of workers can fail ultimately to be other than benefited by the industry of another class. If the scientific section seems to be crowding out the retail pharmacist, then it is his place to see that there is some place in the organization for him to discuss the problems of peculiar interest to him. In other words, if the members of any one section exhibit an unusual degree of activity, then this should be a stimulus to the workers in other sections rather than a hindrance to their efforts.

Furthermore, if a section is derelict in its duties or fails in a measure in fulfilling all the needs for which it was, to a certain extent, created, we need not wonder even if a rival association be organized. President Dohme said in his address last year to the A.Ph.A., in regard to the work of the National Association of Retail Druggists: "The very good work the N.A.R.D. has accomplished could, in all probability, have been accomplished as effectually by the A.Ph.A., provided the right men had been found to take

the work in hand, and if the membership had been increased to make it a still more representative body of American pharmacists. Had the men who now dominate, lead and push the N.A.R.D. been members of the A.Ph.A., and taken hold of our commercial section as they have that of the N.A.R.D., the same results would have been achieved."

This new organization has benefited the A.Ph.A. to the extent of stimulating its activity more than ever in putting forth efforts for securing membership of retail druggists. Fortunately, wisdom and good sense seem to prevail, and there is every indication of the co-ordination of the interests of the two associations.

It was evidently the design of the founders of the A.Ph.A. that that organization benefit in every way the retail pharmacist. They builded, however, better than they knew. Instead of calling it "The American Apothecaries' Association," they called it the "American Pharmaceutical Association." For, while in this naming the object of the organization remained the same, yet it furnished an opportunity for growth, so that the greatest possible good might be rendered pharmacy at large. Pharmacy and medicine, like science proper, have become so specialized that there is an evident need of the American Medical Association and the American Pharmaceutical Association as well as the American Association for the Advancement of Science. Each with its various sections contributes ultimately to the welfare of science, medicine and pharmacy.

Let the members of the A.Ph.A. rise on the waves of progress, and enter the harbor of the new pharmacy with the new century, and let each see to it that he lives up to Article I of the Constitution, which it might be well, in the interests of pharmacy and the Association, to print in large type on cardboard and distribute among the retail pharmacists of the United States.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

DIE ROHSTOFFE DES PFLANZENREICHES. Versuch einer technischen Rohstofflehre des Pflanzenreiches von Dr. Julius Wiesner. Zweite gänzlich umgearbeitete und erweiterte Auflage. 2. Lieferung (Bogen 11-20) and 3. Lieferung (Bogen 21-30). Leipzig: Wilhelm Engelmann. 1900.

Since the review of the first Lieferung of this work of Wiesner

two other parts have appeared. The second *Lieferung* is devoted entirely to the resins. In *Lieferung* 3. the resins are concluded. Besides this there is a new chapter on caoutchouc-yielding plants, which has been worked over by K. Mikosch; two on opium and aloe, which are treated by A. E. Vogl; one on indigo, by H. Molisch; one on the catechu group, by K. Mikosch, and an unfinished chapter on the plant fats by the same author. An extended review of such a comprehensive work is impossible here.

All that was said in the review of the first *Lieferung* (see April number of this Journal) is fully justified, and we can safely say that no botanist or chemist or any other student who is interested in the plant constituents from any standpoint can afford to be without this new edition.

ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE, by Charles E. de M. Sajous and 100 associate editors, assisted by corresponding editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings and maps. Vol. V. Philadelphia: F. A. Davis Company. 1900.

Besides the articles on strictly medical topics, this volume is of great value by reason of the paper on "Nursing and Artificial Feeding," by L. E. Holt and L. E. La Téra. This is a complementary paper to the one published in Vol. IV on "Diarrhœal Diseases of Infants," by Dr. Blackader. There can be no question that the mortality among infants during the summer months would be greatly reduced if the teachings of these articles were carefully considered and practically carried out.

PLANT NAMES, SCIENTIFIC AND POPULAR. Compiled from the most authentic sources by A. B. Lyons. Detroit: Nelson, Baker & Co. 1900.

This book includes in the case of each plant the correct botanical name, in accordance with the reformed nomenclature, together with botanical and popular synonyms and vernacular German, French and Spanish names. The list comprises all important medicinal plants with their pharmacopœial names, the principal food plants of the world and all others of any economic importance, giving special prominence to those which are indigenous to the United States. A copious index serves as a key to this mass of information, enabling the reader to turn quickly to the desired paragraph.

THE AMERICAN JOURNAL OF PHARMACY

AUGUST, 1900.

A COMMERCIAL TRAINING COURSE IN COLLEGES OF PHARMACY.¹

BY JOSEPH P. REMINGTON.

Colleges of pharmacy were created for the purpose of training young men in their vocation. Naturally and primarily, their first function is to make students proficient in technic, and when the colleges were founded in America, chemistry and materia medica were recognized as foundation studies, and they are considered as such to-day.

The early history of pharmaceutical education reveals a curious, but, nevertheless, strong tendency to thwart and oppose the efforts of the far-sighted pioneers who saw in the education and training of the young the gradual uplifting of the craftsmen who were intrusted with the responsible duties of making and dispensing medicines.

Very slowly the colleges fought their way, and it required nearly half a century of earnest self-sacrificing labor to demonstrate the fact, which should have been recognized from the beginning, that education was a key which would solve mysteries and develop great possibilities.

In some cases, undoubtedly, self-interest on the part of the employer, or petty jealousy, led a preceptor to advise an assistant to keep away from colleges; that he, himself, had no use for these expensive and time-consuming new-fangled ideas, but that he could learn from his "boss" far more than those upstart teachers

¹Read at the annual meeting of the Pennsylvania Pharmaceutical Association, June, 1900.

could give him; and even to this day men can be found who use the same talk. Many a poor student in the past has been compelled to earn every penny for his college education, and has succeeded, in spite of enormous drawbacks and hindrances; but the colleges steadily continued their work, becoming stronger every year and succeeded in spite of the most dire prophecies of disaster and failure.

Nearly every advance was met with determined opposition, and how sad is it to hear the wail of some old rule-of-the-thumb druggist, who has discovered, late in life, that all along he had been on the wrong side, and many an honest opponent has confessed to the writer in language something like this:

“If, when I was a young man, I could have foreseen the value of an education, and could have begged or borrowed the money to go to college, I would have done so and have been saved years and years of toil, and what has taken me a long time to learn through the happenings of experience I could have acquired in two years of training. Naturally, I do not want to admit that I do not know my business. I can't acknowledge that these young fellows just out of college know as much as I do. I cannot afford to do it, and in some things they do not know as much as I do; but I have seen to it that my son has not been deprived of the advantages which I threw away, and I sent him to the best college that I could find. But then, the colleges in my day were small affairs, and the systems of instruction imperfect; but I must say there are some things taught in the colleges which I have no use for. The point that I see clearly is that those early years of one's life, when the mind is receptive, and accustomed to study (having just come from school), are the least valuable years in a man's business life, and then is the time when the foundation can be laid strong, sure and deep.”

The writer has no desire to dwell upon this aspect, for it has its pathetic side, and happily, education is rapidly working a cure. Now, if this presents a true picture of the past, is it not true that the same reasoning is equally applicable to branches of pharmaceutical instruction other than those recognized as theoretical, or knowledge obtained through the study of books? The answer to this is found in the magnificent equipment of our laboratories in the colleges, and the great strides made in practical teaching in our universities and technical schools.

No college can be considered, to-day, worthy of the name which does not place in the hands of its students the mortar, pestle and spatula, the test-tube and the burette, and the microscope and culture apparatus; and it must not be admitted for a moment that the laboratory instruction, while useful in giving a student polish and finish, fails to equip him with knowledge which will be valuable in his future life as a bread winner.

But the writer wishes to call attention, at this time, to a branch of education which has been in the past sadly neglected; it is that of commercial training. That pharmacy is a business as well as a profession comes home strongly to that student who is so unfortunate as to have a lop-sided mind, and who vainly thinks that all he has to do to reach the highest success is to study books and, like the closet naturalist, get his knowledge of life from studying the works of others.

What an awakening comes to such an one who, after winning gold medals and prizes galore in his examinations, finds when he gets behind the counter that his magnificent memory for facts will not avail him as much as he thought, when he comes to roll pills, fold powders and meets the perplexing details of every-day counter practice! And it is this phase of college education which is the great stumbling block to the employers who are successful, practical business men. One frequently hears from such men the remark, "Send me a good clerk, I don't want a gold medal man."

The aim in every good college of pharmacy should be to neglect no department of knowledge which might make its graduates successful pharmacists, and no effort should be spared to entirely cover the ground. Impressed with these convictions, the writer, ten years ago, expressed the opinion that business methods should be taught in our colleges of pharmacy. Gradually this thought has been working its way. With some educators the idea at once took root; others again approved, but deemed the time inopportune; others still were to be found who thought it outside of the functions of a college of pharmacy to teach business methods. Possibly the greatest number to-day are willing to give any rational plan for accomplishing the object a fair trial.

Within four years this opportunity has been taken advantage of by the writer in the Philadelphia College of Pharmacy, and fortunately, through the liberality and progressiveness of the trustees

of the Philadelphia College of Pharmacy, it was made possible to establish an optional course on commercial training. This course has been successfully inaugurated by Prof. F. G. Ryan, and so far as it has gone, has thoroughly demonstrated its practicability.

The object of the course is to teach students in pharmacy simple methods of bookkeeping, which will enable the pharmacist to know at any time and at short notice whether he is making money or losing it, proper methods of drawing checks, drafts, promissory notes and even how to write orders on wholesale druggists; in fact, to so train him in correct and accurate methods, that when he takes a position or opens a store he will not be absolutely at sea in these most important particulars. How few retail druggists throughout the country have ever been systematically instructed in these vital details!

Every wholesale druggist who has been made acquainted with the plan of the new course speaks of it in most encouraging terms. Those who oppose every innovation simply because it never has been done before will, of course, be in evidence. One can almost anticipate the objections of the chronic objectors. "Why don't the employer teach assistants bookkeeping?" The answer to this is, what percentage of employers are using to-day simple, proper methods of keeping their books? How many druggists know at the end of the year how much money they have lost or made? What percentage of losses are made in a year, through carelessness and improper methods of keeping books? How many clerks are imbued with a proper sense of the responsibility and duty to their employers, to accurately record sales?

Unfortunately, the scientific and professional pharmacist too often inherits a contempt for such routine work as bookkeeping, and if fortune smiles upon such an one and business pours in upon him, in spite of his limitations, does he not frequently have to employ some bookkeeper who knows nothing of pharmacy and is good for nothing else in the store? And if the employer knows nothing of bookkeeping, has he not literally turned over the keys of his business life into the hands of the enemy?

It is probably too much to expect at once complete approval of the ideas which are advanced in this paper; but the writer sincerely trusts that in the near future no college graduate shall be permitted to receive his diploma until he has passed a satisfactory

examination in commercial training; and of the college who first successfully inaugurates such a course and compels the student at some time to pass an examination in this department, it is safe to say that her graduates will be sought for and preferred by employers because, while they have been thoroughly trained in the knowledge which will enable them to perform all of their duties as chemists and pharmacists, they are not likely to become commercial failures, and lose the results of their hard-earned labors by failing to know "what they have made," add to "what they have made," and, in fact, "cover the whole ground."

One other objection may be heard, "Why don't the man who needs training of this kind go to a commercial college?" The answer to this is, that none of the commercial colleges have ever thought it worth while to establish a course suited for pharmaceutical students, and it is not likely that they could make such a course remunerative to the commercial college, because of the limited number of students who would voluntarily take such instruction.

The courses in commercial colleges are, moreover, very elaborate and usually cast upon lines involving large operations, and the instructors in such colleges are not familiar with the special needs of pharmaceutical business. This paper may be concluded by quoting a remark of a college graduate of ten years' standing, who said: "I only wish that I could have taken a course in commercial training, instead of the special course which I took at the college. I am sure I would now be making a comfortable living, for it would have enabled me to have saved many business losses and some bitter experiences that I have gone through, because I thought business details and methods too insignificant to give them time and thought, at a time in my life which I could have easily spared for this practical work."

It is probable that the great depression through which the drug business has been passing in late years has brought home to many the need of such training, and the words of the graduate above quoted will doubtless find an echo in the minds of many, similarly situated.

URIC ACID IN URINE.—The urine is boiled with an excess of a solution of potassium permanganate, acidified with H_2SO_4 , when the uric acid is quantitatively converted into urea, which is then estimated by the hypobromite process.—A. Jolles, *Z. phys. Chem.*, 1900, 222.

GASOMETRIC ANALYSIS.¹

BY FRANK X. MOERK.

In the present Pharmacopœia only the nitrites are estimated by a gasometric process, although a number of other official and unofficial substances can be estimated by similar methods. As the nitrometer is an expensive piece of apparatus, and requires care and some experience in its manipulation, an effort was made during the past winter to devise a simple and inexpensive apparatus suitable for use in the laboratory and store for the estimation of sweet spirit of nitre; the greatest difficulty encountered was in perfectly removing the air from the apparatus, as this will react with the liberated nitrogen dioxide and cause low results; this was accomplished by the little device, described below, which is recommended in numerous text-books on volumetric methods to regulate the flow of liquids from burettes. After overcoming this difficulty and having the apparatus in good working order, this appeared so simple that the literature was looked up on the subject, and it was found that Dr. E. R. Squibb had covered some of the same points in an apparatus described in *Ephemeris*, Vol. III, p. 1200. In the use of Squibb's apparatus the air is not perfectly removed and mercury is used as the liquid to be displaced, for, as Dr. Squibb states, "several fluids, including brine, were tried in endeavoring to avoid the use of mercury, but none would answer."

The apparatus to which I now call your attention has the following advantages over that of Dr. Squibb: No retort stand or support of any kind and no spring clamp are needed, and, lastly, the apparatus is charged with brine.

As can be seen from the illustration, *Fig. 1*, the apparatus consists of a 4-ounce saltmouth bottle, with doubly perforated stopper; a short piece of glass tubing, flush with the lower end of the cork, is connected by a small piece of rubber tubing with a small funnel; in this rubber tubing at *a* is placed a very small section of glass rod ($\frac{1}{4}$ - $\frac{3}{8}$ -inch) with fused ends, and having about the same diameter as the tubing, so that it can be introduced without much difficulty, and, at the same time, tightly close the rubber tubing. A long glass tube bent twice at right angles, passing through the other

¹ Read at the meeting of the Pennsylvania State Pharmaceutical Association, June, 1900.

perforation of the cork, serves as a syphon when the apparatus is filled, and also supports the small funnel; the outer end of this tube should be bent upwards or else fused to decrease the diameter so as to prevent air from entering and displacing the brine. Another vial, or, better, a graduate or graduated cylinder, is used to collect the displaced fluid.

ESTIMATION OF SPIRIT OF NITROUS ETHER.

To prepare the apparatus for use almost fill the bottle with a saturated brine, close with stopper and place syphon-tube in a vessel containing brine; then, while pressing together the rubber tubing about the small glass plug to form a small channel between the latter and the tubing, apply suction by mouth at the small funnel

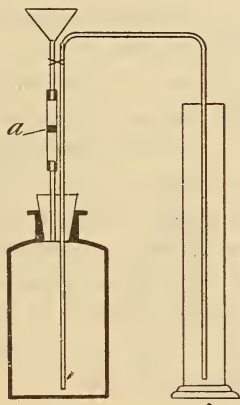


FIG. 1.—Apparatus for the Estimation of Spirit of Nitrous Ether.

until the latter is partly filled with brine when the tubing is released; it will be found that all air has been removed from the bottle and tubing below the plug (should a bubble or so be found below the cork a little manipulation will cause it to enter the glass tube, and it can then be withdrawn by suction after compressing the tubing). The apparatus is now to be adjusted to *zero*; this simply means allowing the brine, by compressing the rubber tubing at *a*, to flow out of the syphon-tube until the brine in the funnel stands level or even with the upper end of the rubber tubing. Replace the vessel containing the brine by the graduated glass, and you are ready for the assay. Allow 5 c.c. sweet spirit of nitre to

slowly run into the funnel and from this into the bottle by compressing the rubber tubing (prevent air from entering the bottle by not allowing the liquid to get lower than the zero mark), rinse funnel and tubing with 5 c.c. alcohol, then introduce 10 c.c. potassium iodide (10 per cent.), and lastly 10 c.c. diluted sulphuric acid (10 per cent.), added in portions to prevent too violent liberation of gas and consequent pressure which might result in some gas escaping through the funnel. (The alcohol is used as stated to rinse in the "nitre" and thus prevent liberation of gas which always takes place when ethyl nitrite comes in contact with water or aqueous solutions; if such a decomposition takes place above the glass plug the gas escapes into the air and is lost in the assay.) Mix the reagents first by gentle agitation, and after evolution of gas ceases by more vigorous agitation; allow to stand ten to fifteen minutes, lift the syphon-tube from the graduated cylinder and read the volume of displaced fluid; subtract from this the volume of the added reagents to obtain the volume of nitrogen dioxide from the sweet spirit of nitre; divide the volume of gas by that of the nitre used to obtain the volumes of gas from one volume of spirit of nitrous ether (eleven volumes at or near 25° C., U.S.P.).

Of the various factors which influence the volumes of gases, as temperature, barometric pressure, solubility and tension of the aqueous vapor, the last three are disregarded, but for temperature the U.S.P. gives the value, in terms of amyl, ethyl and sodium nitrites, of 1 c.c. gas at 0° and 25° C., besides a table, by which corrections can be made from 0° to 40° C.

ESTIMATION OF SODIUM NITRITE.

To estimate *sodium nitrite* dissolve 0.150 gm. in 5 c.c. water, introduce into the apparatus, rinse with 10 c.c. water and follow with 10 c.c. potassium iodide and 10 c.c. diluted sulphuric acid and proceed as previously described; the volume of gas from 0.150 gramme should measure not less than 50 c.c. at 15° C., or 51.7 c.c. at 25° C. (97.6 per cent. pure NaNO_2 U.S.P.). Repeated comparisons of the described apparatus with nitrometers have been made during the past six months in the estimation of spirit of nitrous ether and of sodium nitrite, and the uniformly agreeing results obtained by different persons warrant the recommendation as an inexpensive substitute for a nitrometer; the only advantage possessed by the latter depends upon its graduation.

ESTIMATION OF UREA.

For the estimation of urea there are needed one $\frac{1}{8}$ -ounce homeo vial and an extra 4-ounce saltmouth bottle with a doubly perforated rubber stopper through which pass a small straight glass tube with a small section of rubber tubing closed by a piece of glass rod and a small piece of glass tubing bent at right angles and connected with a 6-inch section of small rubber tubing. The funnel and rubber tubing with the glass plug are disconnected from the apparatus used for the nitrites and the two 4-ounce bottles connected with the rubber tubing as shown in *Fig. 2*.

Place 40 c.c. Labarraque's solution in the extra bottle *G*, which is used as the generator; measure 4 c.c. urine into the homeo and carefully lower this into the generator so that the two liquids do not

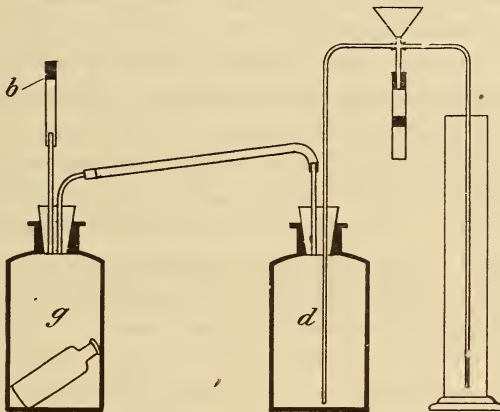


FIG. 2.—Apparatus for Estimation of Urea.

mix. Fill the other 4-ounce bottle *D* with water, insert stopper and place syphon-tube in a vessel containing water; now remove glass rod from *B* and by suction fill syphon-tube and water bottle perfectly and again insert rod in *B*. The two bottles should be wrapped with strips of several thicknesses of paper so that in handling them the heat of the hand does not cause expansion of the air or gas; it is also convenient to have them upon a small piece of board so that they can be lifted and the syphon-tube withdrawn from or introduced into any desired vessel. Replace the vessel of water by the graduated cylinder and watch for a few moments to see if the connections are all tight, then incline *G* so that the liquids mix and

agitate ; repeatedly fill and empty the homeo by proper inclination of G ; after the evolution of gas ceases upon agitation, allow to stand ten to fifteen minutes, lift the bottles and read the volume of displaced water ; the number of cubic centimetres multiplied by 0.0027 will give the urea in 4 c.c. of urine.

No correction is applied for the volume of gas being under other than normal conditions for the reason that in the decomposition of urea there is involved a loss of about 8 per cent. nitrogen and this loss is just about balanced by the effect of temperature, pressure and tension of aqueous vapor under ordinary conditions.

ESTIMATION OF HYDROGEN DIOXIDE.

The gasometric estimation of *hydrogen dioxide* is possible in two ways ; the one generally followed starts with a solution of potassium permanganate of such strength that a definite volume is indicative of a definite volume of oxygen without collecting and measuring the latter. By using the apparatus described under urea, but substituting acidified permanganate instead of Labarraque's solution and hydrogen dioxide instead of urine, very concordant volumes of water were displaced, one-half of which came from the H_2O_2 , the other from the $K_2Mn_2O_8$. The only objection was the separation of manganic oxide as a brown stain upon the interior of the apparatus and which must be removed each time by the use of oxalic or sulphurous acid. Experiments were next made with an acidified bichromate solution ; this, of course, was free from precipitate, but the results varied according to the rapidity with which the reagents were allowed to mix, the volume of gas often agreeing with that obtained with permanganate, but sometimes was considerably below this volume. The use of an aqueous bichromate solution, however, gave very uniform results, no matter if 0.5 per cent., 5 per cent., 10 per cent. or a saturated solution was used ; the only difference noticeable was in the rapidity of the reaction, this increasing with the stronger solutions. Upon mixing the dioxide with the bichromate there is formed a deep blue coloration, changing through a violet to a brown, and finally into the original orange color ; the bichromate is, therefore, only temporarily oxidized to perchromic acid or a perchromate, and this in turn is reduced again to the condition of bichromate. The volume of gas therefore comes only from the dioxide.

The operation is effected as follows : Place 20 c.c. saturated bichro-

mate of potassium solution in *G* and 2 c.c. or 4 c.c. of hydrogen dioxide in the homeo; fill *D* and the syphon-tube as previously described and proceed. The complete decomposition does not take more than two or three minutes, and has been complete in one minute. It is possible to use the bichromate solution over and over again; simply remove the homeo, wash this, charge with dioxide and proceed again. Divide the volume of the displaced water by the volume of the dioxide used for the volume strength of the dioxide. In determining the strength of the dioxide by the U.S.P. assay process and comparing it with the one just described, it was found that the latter gave high results, due particularly to effect of temperature and aqueous tension; the solubility of oxygen cannot be of much consequence, or results obtained by conducting two assays one after the other with the same bichromate solution should give somewhat higher results in the second assay, but this was not the case. The effect of barometric pressure is much less than that of the two first mentioned, and can ordinarily be left out of consideration just as it has been disregarded in the Pharmacopœia. The following corrections for temperature and tension of aqueous vapor are easily applied, and then give results comparing very closely with the U.S.P. process:

Temperature.	For Exact Correction Volume of Gas is Divided by	For Approximate Correction Subtract from Volume of Gas.	Error of Approximate Correction. Per Cent.
10° C.	1'0488	$\frac{1}{22}$	+ 0'11
15° C.	1'0719	$\frac{1}{15}$	+ 0'05
20° C.	1'0967	$\frac{1}{11}$	- 0'30
25° C.	1'1236	$\frac{1}{9}$	- 0'12
30° C.	1'1533	$\frac{1}{7}$ and add $\frac{1}{100}$	- 0'16
35° C.	1'1866	$\frac{1}{6}$ and add $\frac{1}{100}$	- 0'13
40° C.	1'2245	$\frac{1}{5}$ and add $\frac{1}{50}$	- 0'09

RESULTS OF SOME ANALYSES.

U.S.P. PROCESS. ¹		NEW METHOD.		
Per Cent. H ₂ O ₂ .	Volumes Oxygen.	Volumes Oxygen Found.	Approximate Correction for Nearest Temperature.	
1	2'94	9'71	11' at 25° C.	9'78 at 0° C.
2	3'09	10'22	11'5 " 23° C.	10'23 " 0° C.
3	3'14	10'40	11'75 " 26° C.	10'45 " 0° C.
4	3'11	10'28	11'63 " 26° C.	10'34 " 0° C.

¹ To change percentage of hydrogen dioxide into volumes of available oxygen, divide the percentage by 0'30275 or multiply the percentage by 3'303.

To change volume of available oxygen into percentage of H₂O₂, divide the volume by 3'303 or multiply the volume by 0'30275.

Without doubt the list of substances which can be estimated by gasometric analysis is easily extended; among these may be mentioned chlorinated lime, Labarraque's solution, barium dioxide, chlorine water, etc. For these the best conditions must be ascertained and the results compared with those obtained by volumetric processes—work which will be presented in another paper.

WHITE WAX.¹

BY HENRY C. C. MAISCH, PH.G., PH.D.

Answer to Query No. 44: Yellow and white beeswax and spermaceti. Would it not be advisable to include the requirements for the acid and saponification numbers for these substances?

During the last year three samples of white wax were submitted to me for examination in the analytical department of Messrs. Hance Brothers & White. They varied in color from a pure white to a decided yellowish tint. In the following report the samples will be referred to by numbers.

No. 1 was pure white in color and showed the specific gravity 0.9623 at 15° C.

No. 2 was of a yellowish shade and had the specific gravity 0.9545.

No. 3 was of a decided yellow tint, and showed the specific gravity 0.9432.

All three samples had a lower specific gravity than is recognized by the U.S.P., viz.: 0.965 to 0.975. The melting point was about the same for all three, Nos. 2 and 3 melting from 63.5 to 64° C. and No. 1 at 64° C. In their behavior toward concentrated sulphuric acid at 160° C. they differed to some extent. Nos. 1 and 2 turned brown, while No. 3 was blackened and evolved sulphurous acid to a considerable extent. On dilution with water no waxy body was separated, showing the absence of paraffin, which was also proven by a chemical examination.

The determination of the acid number was carried on as follows:

No. 1	3.3235	grammes.
No. 2	3.3302	"
No. 3	3.1805	"

¹ Read at the meeting of the Pennsylvania State Pharmaceutical Association, June, 1900.

were each heated with 20 c.c. alcohol, 95 per cent., and, when melted, thoroughly shaken. One cubic centimetre phenolphthalein solution was then added and the mixture titrated with an alcoholic potassium hydrate solution containing 30 grammes pure KOH in 1,000 c.c. alcohol, 95 per cent. There were required for

No. 1	2.85 c.c.
No. 2	2.9 "
No. 3	2.6 "

to bring to a faint pink, 20 c.c. more of the alcoholic potassium hydrate solution were added and the whole heated on a water-bath for fifteen minutes. The solution was then titrated back with one-half normal sulphuric acid, requiring for

No. 1	6.9 c.c.
No. 2	7.45 "
No. 3	8.65 "

To determine the titer of the alcoholic potassium hydrate solution, 25 c.c. were heated on a water-bath for fifteen minutes, phenolphthalein added and then titrated with one-half normal sulphuric acid, requiring 20 c.c., showing the presence of 22.396 milligrammes KOH in 1 c.c. of the alcoholic solution. The above results obtained with sulphuric acid expressed in quantities of alcoholic potassium hydrate solution are for

No. 1	8.625 c.c.
No. 2	9.3125 "
No. 3	10.8125 "

leaving for the combined KOH,

No. 1	14.225 c.c.
No. 2	13.5875 "
No. 3	11.7875 "

Now, calculating from these data the number of milligrammes potassium hydrate required to neutralize the free acid in 1 gramme of wax, we obtain the so-called "acid numbers," as follows:

No. 1	19.209
No. 2	19.503
No. 3	18.309

The "saponification numbers" represent the number of milligrammes of potassium hydrate required to saponify 1 gramme of wax, and are as follows:

No. 1	95·857
No. 2	91·376
No. 3	65·932

The difference between the two will give the " ester number : "

No. 1	76·646
No. 2	72·873
No. 3	47·623

Dividing the ester number by the acid number, we obtain the proportional number, which, in these cases, is,

No. 1	3·99
No. 2	3·73
No. 3	2·6

v. Hubl and Allen use the following numbers for white and yellow wax :

	White Wax Chem- ically Bleached.	Yellow Wax.
Acid number	24	20
Ester number	71	75
Saponification number	95	95
Proportional number	2·96	3·75

The question of including the acid and saponification number in the pharmacopœial description of the waxes and spermaceti I would consider as being in the right direction, but I would also include all the fat oils in this group, as here the recognition of adulteration is possibly of greater importance. Should these requirements be included in our Pharmacopœia, it would be necessary to experiment with the formulas for cerates and ointments, so as to adapt them to the increased requirements for purer crude materials.

The application of these saponification processes is not any more difficult than the volumetric examinations which have been incorporated in our present Pharmacopœia.

POWDER FOLDERS.¹

BY I. M. WELLS.

The powder folder is one of the indispensables of a well-equipped prescription counter, and should combine the following qualities in order to be a success :

¹Read at the meeting of the Pennsylvania State Pharmaceutical Association, June, 1900.

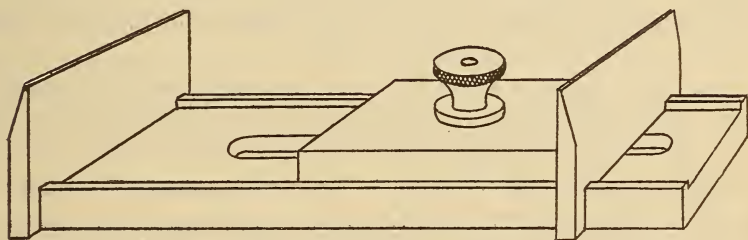
(1) It should remain firm when placed on the counter, and not be easily upset or disarranged.

(2) To be simple of construction in order to insure cheapness, and easy of manipulation.

(3) To be easily changed to suit the various sized powder boxes, and to remain as arranged until changed by operator.

It is true we have several powder folders already upon the market, such as the expanding, cylinder and saw-buck. Besides these, many pharmacists have strips of tin with the ends bent up at right angles. This requires a different tin for each size of powder box used. Other pharmacists use the part of the powder box used to hold the powders after they have been folded and are ready to be dispensed.

The saw-buck folder seems to be the best of them all, and yet has all the objections mentioned above, and to add to these, there



A New Powder Folder.

is no way to fasten it to a given size so it cannot slip. We have an occurrence in our mind, which occurred in one of the leading pharmacies of this State, in which one of the clerks was folding powders. The party was waiting for the medicine. The prescription was for twenty powders. The clerk in his quick movements caught his coat sleeve on the old saw-buck, and away it went. He laid down his spatula and powder, reset the folder in a few minutes, and had all folded but the last powder, which he was just placing on the buck, when it slipped, and the powder was on the counter. He muttered something in a low tone of voice, and the clerk who was beside him said, "Frank! don't you think you had better see the priest?"

After this experience came under my observation, I looked up the powder folders then on the market. All had the same objections

mentioned. That evening, after my day's work was over, I sat down, took a cigar box, pocket knife, hammer, and a few small nails. I cut out my idea of a powder folder piece by piece, and nailed them together, and the next day at noon took it to a machine shop and had it made.

It consisted of two small pieces of brass and a small bolt, with a milled edge nut so that it could be easily turned with thumb and finger. The first piece is $4\frac{1}{2}$ inches long, and $\frac{3}{16}$ of an inch thick, with the edges turned up $\frac{1}{16}$ of an inch. The end is turned up at right angles $1\frac{1}{8}$ inches, and is two inches wide. In the long flat part there is a slot $\frac{3}{16}$ of an inch wide on top, $1\frac{1}{4}$ inches on the under side, and $3\frac{1}{2}$ inches long.

The second piece is $1\frac{3}{4}$ inches long, $1\frac{1}{4}$ inches wide, and $\frac{1}{4}$ of an inch thick, with a $\frac{3}{16}$ -inch hole in it. The end is turned up $1\frac{1}{8}$ inches, is $\frac{1}{8}$ of an inch thick, and 2 inches long. When placed together with upturned ends opposite each other, the second piece could slip along between the upturned edges of the first piece, and the hole and slot be opposite each other.

The third piece is a bolt $\frac{3}{16}$ of an inch thick, and $\frac{3}{4}$ of an inch long, with a milled edge nut and a countersunk head to fit the slot in the first piece, and flush with the face or bottom, when first and second parts are placed together. The bolt comes up through the slot in the first part and the hole in the second part, and is secured with the milled edge nut. To change from one size to another, simply loosen the nut and move the upturned ends together or apart as you may desire; give the nut a turn to tighten it, and your powder folder cannot slip.

This folder will sit solid on the counter, and, being low and having a broad base, will not tip over, and will never allow the ends to move unless the nut is first loosened. On account of the simplicity of the folder and ease of manipulation and cheapness of construction, it should commend itself to every pharmacist who takes a pride in his profession, and labors for the good of his fellow-men.

In conclusion I wish to say that a drawing accompanies this description, and further that it is not patented. Any one is at liberty to make one, or have one made for his own pharmacy.

LABORATORY NOTES.¹

BY CHARLES H. LA WALL, AND ROBT. C. PURSEL.

The following analytical notes have been obtained during the past year in the practical examination of the substances under consideration :

Glycerin.—Ten (10) samples of glycerin, representing over 150,000 pounds, were examined, with the following results :

	Min.	Max.	Average.
Specific Gravity	1'2535	1'2610	1'2572

The samples in every case complied with all but one of the U.S.P. requirements. The test for fatty acids which is contained in the U.S.P. is either too rigid or the manufacturers of glycerin are careless in its purification, for every sample developed a distinctly acidulous odor when heated with dilute sulphuric acid as required by the U.S.P. To free the glycerin from this accompanying trace of fatty acid would, doubtless, increase its cost to the consumer, and its presence probably does no great harm in most cases in which glycerin is used.

Carbon Disulphide.—Twelve (12) samples, representing several hundred pounds, were examined, with the following results :

	Min.	Max.	Average.
Specific Gravity	1'2608	1'2779	1'2652

All samples examined contained traces of dissolved sulphur, and a few showed the presence of sulphur dioxide. In this case, as in the case of glycerin, the further purification of the article would, doubtless, increase its cost without any material advantage.

Carthagera Ipecac.—About two years ago the scarcity of Rio Ipecac led to the importation in a small way of Carthagera Ipecac for trial by manufacturers.

The United States custom authorities attempted to prevent the importation of the Carthagera variety on the grounds that it was not the official drug, and would be used as an adulterant. Upon making an appeal and proving the identity of the species by referring to the botanical authorities, and also showing that its alkaloidal content was equal to, if not higher than, the Rio variety, its importation was allowed, and, since that time, many thousands of

¹ Read at the meeting of the Pennsylvania State Pharmaceutical Association, June, 1900.

pounds* have entered the American market. The assay of about twenty (20) consignments, representing about 3,000 pounds, showed the following results :

	Total Alkaloids, Moist. Per Cent.	Moisture. Per Cent.	Total Alkaloids, Dry. Representing the Powdered Drug. Per Cent.
Min.	1'85	3'18	1'92
Max.	2'29	4'40	2'40
Average	2'03	3'87	2'11

The figures show the Carthagena root to be richer in total alkaloids than the Rio Ipecac, but no investigation has been made recently to determine the proportions of the several alkaloids in order to determine whether the two varieties agree in this respect.

Indigo.—Several samples of Indigo came up for examination, of which the *Bengal* variety was far superior to the *Madras*, as the following results indicate :

	Per Cent.
Bengal Indigo, Ash	8'57
Madras " No. 1, Ash	75'00
" " No. 2, Ash	69'09

Crocus.—A number of samples of Spanish Saffron were examined, with the following results :

	Min.	Max.	Average.
Nine (9) samples, per cent. of ash	4'57	6'83	5'80

Only one sample contained a preponderance of the yellow styles of the flower, indicating sophistication or careless collection.

Honey.—The examination of a number of samples of Honey, representing several thousand pounds, showed this product to conform to the U.S.P. requirements in every respect, and the polariscope test also indicated the absence of adulteration. The results of the examination of ten (10) samples showed the specific gravity to vary from 1·4277 to 1·4904, with an average ash content of 0·09 per cent.

Podophyllum Resin.—A sample of Resin of *Podophyllum*, which was recently offered at a very low price, was examined, and found to be almost entirely insoluble in both ether and alcohol, and to possess the characteristics of the powdered drug instead of the resin.

Aloin.—A sample of aloin from the same source as the *podophyllum* resin had a melting point of 82·2° C., and its behavior to solvents and microscopic appearance indicated that it was simply powdered aloes.

Barium Dioxide.—This chemical, which is used in the manufacture of hydrogen peroxide, is imported from Germany. Of fifteen (15) casks examined, five (5) were below the U.S.P. requirements, averaging 72.76 per cent. BaO_2 (U.S.P., 80 per cent.).

Great difficulty was also experienced in properly hydrating this product, and the hydrogen peroxide made from it was below the standard strength in most cases. The other ten (10) casks averaged 86.09 per cent. BaO_2 , and were perfectly satisfactory, both as regards hydration and strength of the resulting product.

RECENT LITERATURE RELATING TO PHARMACY.

A STUDY OF VANILLA. *Lo G*

A recent German governmental publication contains a paper on vanilla, by W. Busse (abstract in *Ap. Zeit.*, 1898, 894). It begins with the history of the drug and then emphasizes the success of its culture in German Africa. An account of the harvesting of the bean then follows, which, beside describing the usual fermentation (Mexican) process, mentions a second method of preparation—dipping in hot water, drying in sun and oiling.

After reciting the several commercial varieties, ranging in value from the Mexican to the Tahiti (which contains piperonal as well as vanillin), the writer reports a careful study of the anatomy of the fruit, of which the most portion relates to the oil-secreting papilla on the interior.

On the chemistry of the drug, the writer particularly emphasizes the fact that vanillin strength is not the sole criterion of value. He suggests as a vanillin assay, extraction of the fruit with ether, removal of vanillin from the solution by agitation with sodium bisulphite solution, separation of the vanillin from this by treatment with sulphuric acid, evaporation of the developed sulphurous oxide and extraction of the freed vanillin with ether. H. V. ARNY.

ANALYTICAL VALUE OF VITALI'S REACTION.

For identification of atropine, two striking tests are known. The first is the floral aroma, produced on oxidizing the alkaloid or its salts; while the second—the so-called Vitali's reaction—is the violet-blue color, produced when the alkaloid is evaporated to dryness

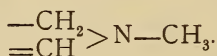
with fuming nitric acid, and the residue treated with potassium hydrate.

The theoretical value of these reactions was the subject of a paper read by Kunz Krause before the "Deutsche Naturforscher Versammlung." He applied the second reaction to seventeen natural alkaloids and to five heterocyclic bases, and found, of these, only atropine and hyoscyamine gave the characteristic color. Papaverine, it is true, does give a color; but it is only a transient red. Hence, the reaction is certainly of great value for toxicological purposes.

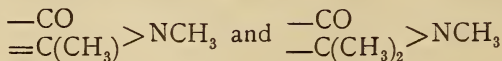
In his investigation of Vitali's reaction, the writer discovered an interesting phenomenon—that when the alkaline and colored atropine residue was covered with alcohol and allowed to stand, the unmistakable odor of methyl carbylamine, CH_3NC , was developed.

The same odor was detected after similar treatment of eight of the seventeen alkaloids, hyoscyamine, hydrastine, hydrastinine, morphine, codeine, narcotine, nicotine and cocaine. Under similar conditions, papaverine develops a musk odor, and veratrine first smells of coniine and afterwards of new-mown hay.

A careful comparison of the accepted structural formulæ of the nine alkaloids, giving the carbylamine odor, was next made, and it was found that the point of similarity was that each alkaloid contained the group



Of the synthetic bases, two gave the carbylamine odor and these contained the groups



respectively.

On the other hand, caffeine, which contains three similar methylamide groups,



does not give the reaction.

The deductions of the author are that a carbylamine odor developed in Vitali's reaction indicates one of the three groupings first mentioned—a most valuable diagnosis, if true.

H. V. A.

EDITORIAL.

STATE PHARMACEUTICAL ASSOCIATIONS.

During June and July two-thirds of all the State pharmaceutical associations hold their annual meetings. The places of meeting are generally, as will be seen from the reports of the various associations, in another part of this JOURNAL, at some recreative resort rather than in the larger cities. The advantages of each of these places for the holding of conventions have already been alluded to in an editorial in this JOURNAL (1898, p. 453). At that time some of the benefits of conventions were also given. There was one benefit, however, which was not referred to, but which really is one of the most important that accrue from these annual meetings. The benefit which most of us see in these conventions, with their accompanying pleasures, is one which is individual or extends at the most to the family; but there is really a greater benefit to the professions, sciences and arts, whose members are thus brought together. It is true that the members do have a good time and return home with renewed vigor for the work to be done; but this is probably one of the least benefits from these gatherings. The greatest benefit possibly accrues from the organization itself to the profession, science and art which it represents. The power for good here is apparently seldom referred to or realized to its greatest extent. President Dohme, in his address to the Maryland Pharmaceutical Association, showed the great possibilities of organization. "If," said he, "we could only get our membership up to a fair proportion of the total number of pharmacists in the State, we would have a much better opportunity and standing before the Legislature, when we appear before it in behalf of a bill we are offering." If each pharmacist would recognize his obligations to his profession by becoming affiliated as a member with his State organization, there would be nothing that would be denied him by legislature and there is no question but that his importunities would be heard. This is an age of organization and every man counts in the work, be it in politics or in the professions. If appeals and resolutions to legislatures were backed up by organizations upon whose rolls are names of all the pharmacists of the State, there would be fewer difficulties in the way of reforms. Every pharmacist should appreciate this phase of the benefits of organizations, and even though he cannot attend the meetings, his name on the roll of the State

organization would mean that he has a voice in its deliberations. His influence as a member merely will do much good ultimately to his profession, as his attendance at the meetings would do him good personally.

It might be well at this time to call attention to one reason why the work of the various associations is not a source of more fruitful results. Dr. Dohme, in his address, touches upon but one phase of the efficiency of the work of organization. While it is true that membership is a potent factor in legislation, it must not be forgotten that education should go hand-in-hand with legislation. If the secretaries of all the State pharmaceutical associations would, like the Secretaries of the Missouri, Ohio and South Carolina, and possibly some other Pharmaceutical Associations, send out condensed reports of their annual meetings to all the different pharmaceutical journals, the influence and efforts of the association would be felt and appreciated by a large number of pharmacists, many of whom are members of other State organizations, and also by those who are not members of any organization. Such steps would tend to bring every State association into prominence and enable it to wield an influence for good, as the Missouri Association is doing. (See Review of Proceedings of Missouri Pharmaceutical Association, this JOURNAL, 1899, p. 293.) It must also be said that some such action is necessary in order not to make its members, and particularly its contributors, ludicrous in the eyes of the readers of the pharmaceutical press. The names of members, as frequently reported, are incorrect, the titles of papers are not infrequently wrong, and the whole proceedings as reported are made to appear, therefore, more or less ludicrous.

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

The twenty-third annual meeting of the Pennsylvania Pharmaceutical Association was held at Ebensburg, Pa., from June 26th to 29th. After the usual welcome, the President, C. N. Boyd, Butler, Pa., made the annual address. He congratulated the Association on the improvement of trade conditions. In some places the volume of business has increased; in others former prices have been restored. The druggists of the country begin to see the benefit that can be brought about by organization, and only by united action can their business be improved.

The third annual meeting of the Pure Food and Drug Congress was attended by a committee from this Association. They took an active part in its deliberations and assisted in securing the recommendation of a bill that will secure the objects sought after.

The preparations of the National Formulary are deserving the attention of the members of this Association. The attention of physicians should be called to them as preparations of known merit, to replace many preparations of doubtful composition now sold.

The work of the National Association of Retail Druggists was commended and the Association urged to send delegates to the next annual meeting in Detroit. The injustice of the War Revenue Act as applied to druggists was referred to, and the hope expressed that the government will do something to lighten the burden now imposed upon them.

The high standing of our pharmaceutical colleges, which are not surpassed by any others, was asserted and the advantage of a college education pointed out as a prerequisite for examination before the Examining Board.

The reading of the drug journals was recommended as an aid to a pharmaceutical education.

After approving the objects of the American Pharmaceutical Association and expressing his satisfaction on account of the pleasant relations existing between this Association and the State Medical Society, the remaining portion of the address was taken up in the consideration of a large number of replies he had received from members of the Association in answer to a series of questions relating to the Association and its work.

Three district meetings of the Association—eastern, middle and western—were recommended; also, that certificates of membership be furnished without charge. The address concluded with a reference to the great advancement made in pharmacy during the century now closing.

The reports of the officers and various committees, as well as delegates to various conventions, were read. Resolutions were offered in favor of the reappointment of C. T. George as member of the State Pharmaceutical Examining Board, for making Professor Ryan an honorary member of the Association, and for the advancement of hospital stewards in the Pennsylvania State Guard, etc.

The following officers were elected for the ensuing year: Presi-

dent, S. K. Hammond, West Chester; First Vice-President, C. B. Lowe, Philadelphia; Second Vice-President, Charles Griffith, Johnstown; Secretary, Jacob A. Miller, Harrisburg; Treasurer, J. L. Lemberger, Lebanon. Executive Committee—Cyrus Jacoby, South Bethlehem; S. W. Heinitsh, Lancaster, and George A. Gorgas, Harrisburg. Local Secretary, D. J. Thomas, Scranton.

The next meeting will be held at Hotel Oneonta, on Harvey's Lake, near Wilkesbarre, June 18, 1901.

PAPERS AND QUERIES.

The number of papers presented was about as usual. F. W. E. Stedem, the Chairman of the Committee, was commended by the Association for the success of this feature of the meeting. They were as follows:

A COMMERCIAL TRAINING COURSE IN COLLEGES OF PHARMACY.

By Joseph P. Remington.

This is printed in full on page 361 of this JOURNAL.

ADORNMENT OF DRUG STORES WITH PLANTS.

By Henry Kraemer.

This paper may be regarded as an answer to the query proposed last year, which read: "Wanted, a paper on the use of plants for adorning drug-store windows, specifying the best varieties." The author divided the plants to be used for this purpose into the following groups:

I. POTTED PLANTS, which may include (*a*) plants in pots (proper); (*b*) plants for hanging baskets; (*c*) bulbous plants for vases, etc.

II. AQUARIA.

GASOMETRIC ANALYSIS.

By Frank X. Moerk.

This is printed in full on p. 366 of this JOURNAL.

WHITE WAX.

By Henry C. C. Maisch.

This is an answer to the query "Would it not be advisable to include the requirements for the acid and saponification numbers for yellow and white beeswax and spermaceti?" This paper is printed on p. 372 of this JOURNAL.

POWDER FOLDERS.

By I. M. Weills.

A description of an original invention by the author (see p. 374 of this JOURNAL).

LABORATORY NOTES.

By Charles H. La Wall and Robert C. Pursel.

These analytical notes are published on p. 377 of this JOURNAL.

FORMULÆ FOR ZINC OINTMENT.

D. J. Thomas presented the following notes :

Ointment of zinc oxide, prepared according to the process of the U.S.P. of 1890, will, with a slight modification, yield a very satisfactory product. Care should be taken in the selection of the materials used in the preparation of the ointment, and the finished product should always be kept in a cool place and never allowed to be subjected to a temperature sufficiently high to liquefy the ointment. Oxide of zinc that will stand the pharmacopœial tests, showing an absence of contaminating salts, should only be used, but still greater caution should be exercised in the selection of the lard for benzoination. Nothing but dehydrated lard should be used, as the presence of water is doubtless the cause of the granulation or decomposition of the ointment. The Pharmacopœia suggests in the preparation of benzoinated lard the addition of 5 per cent., or more if necessary, of white wax. To stand the extreme heat of summer, it will be found necessary to increase the quantity of white wax to 10 per cent. In winter, 5 per cent. will be sufficient. The process used by the writer, and one which gives satisfactory results, is as follows:

Take of Zinc Oxide U.S.P.	200 grammes.
Dehydrated Benzoinated Lard	800 “
	<hr/>
To make	1,000 “

Sift the zinc oxide through a No. 20 sieve into a porcelain or wedgewood mortar. By means of a water-bath heat the benzoinated lard in a porcelain capsule, and while in a melted state thoroughly incorporate it with the zinc oxide. Transfer the whole to the capsule, reheat it on the water-bath, and when sufficiently

melted, strain through moderately fine gauze or cheese cloth, after which it should be stirred constantly until cold.

John F. Patton presented the following notes :

NO. 31. FORMULA FOR ZINC OINTMENT.

It is presumed this means oxide of zinc ointment.

The first requisite is a good article of oxide of zinc.

We have always found "Hubbuck's" English oxide of zinc to meet all the requirements of an excellent article.

Our experience with the twenty-three ointments of the Pharmacopœia is in the small quantity at present prescribed by physicians.

The ointment of the oxide of zinc is most frequently dispensed. Then comes tar ointment and the ointment of the nitrate of mercury.

The first, made by the following formula, yields a product that leaves nothing to be desired.

Triturate $8\frac{3}{4}$ ounces of Hubbuck's oxide of zinc with 6 ounces olive oil to a smooth paste.

Have your mortar of ample capacity and well warmed.

Then introduce a mixture of $6\frac{5}{8}$ ounces white wax and $33\frac{1}{2}$ ounces washed lard, previously melted over a water-bath.

Stir constantly until cool, finally add $1\frac{1}{2}$ ounces of tincture benzoin, prepared by the following formula :

Gum Benzoin in tears	2 ounces.
Ether	4 "
Macerate until dissolved, filter and add :	
Castor Oil	2 "

For benzoinating lard, this tincture in proportion of $\frac{1}{2}$ ounce for each pound of the ointment will be found to answer the purpose admirably.

Whilst on the subject of ointments, it will not be amiss to discuss the merits of an ointment which, if made according to the direction laid down in the U.S.P. of 1870 and 1880, gave the manufacturer no end of trouble, from the fact that it had a disposition to assume a granular consistency on being kept for any length of time. I refer to Ungt. Hydrarg. Nit.

This can be obviated and a most satisfactory ointment produced by the addition of petrolatum, to the extent of one-third of the amount of lard required.

A very satisfactory cold cream of the right consistency and of unexceptionable keeping quality results from employing the following formula :

White Wax	1 ½ ounces.
Spermaceti	1 ½ "
Oil Sweet Almonds	4 "
Fuse over a water-bath, to which add :	
Powdered Borax	½ drachm.
Rose Water	5 drachms.
Oil Lemon	20 drops.
Oil Rose	10 "

Dissolve the Borax in the Rose Water with the aid of heat; add whilst hot; add to the melted wax and spermaceti, and lastly, add the perfume, and stir until cold.

CONDENSED MILK.

By Frederic E. Niece.

The author made an examination of widely-known domestic condensed milks. The methods of analysis employed were those recognized by the United States Agricultural Chemists. In summing up the results the author says the presence of deleterious substances was not fully established, and that he was unable to detect any of the usual suspected adulterants, applying as he did the most sensitive and recognized tests.

ANTI-NOSTRUM PRESCRIPTIONS.

By Louis Emanuel.

The author called attention to the fact that a number of physicians, owing to their aversion to presenting proprietary preparations, were writing prescriptions which contained the ingredients of some of these well-known preparations, and that it should be the policy of the pharmacist to encourage this effort with all the cunning, art and diplomacy that is possible to command, in order that a charge of incompetency may not be fostered against him. The author gave a number of illustrations.

SHOULD THE PHARMACIST WHO IS SKILLED IN THE RECOGNITION OF BACILLI, AND THE ANALYSIS OF URINE, ETC., OFFER HIS SERVICES FREE TO PHYSICIANS, OR SHOULD HE MAKE A CHARGE FOR THE SAME?

By Frederick T. Gordon.

On the basis that "the laborer is worthy of his hire," the author made a plea for the maintenance of the professional self-respect of pharmacists.

THE COMMERCIAL SIDE OF PHARMACY.

By Charles Leedom.

The author considered the subject of the cutting of prices of patented and proprietary medicines as well as every popular selling drug, and suggested some ways of remedying the evil.

SHALL THE PHARMACEUTICAL PRESS BE THROTTLED?

By D. J. Thomas.

An examination of 1,000 consecutive prescriptions showed that 400 were for proprietary products. This means, according to the author, the paying of a heavy tribute to the patentees or proprietors of pharmaceutical preparations, and in consequence a falling off in the use of the Pharmacopœial and National Formulary products not under the proprietary or patented schedule. The author suggested the distribution on the part of the pharmacist, of literature pertaining to, and samples of, the products of the Pharmacopœia and National Formulary and other preparations.

WHAT IS THE BEST COURSE TO PURSUE TO REPRESS THE SALE OF PROPRIETARY ARTICLES THAT YIELD NO PROFIT?

By John F. Patton.

The answer given is, "don't sell them," and enter into competition with articles of like character of your own manufacture.

BOOKKEEPING FOR DRUGGISTS.

By Charles H. La Wall.

The author estimates that less than 10 per cent. of the retail druggists in the larger cities keep a systematic record of their business transactions. The writer gives an outline of a simple system of bookkeeping for the use of druggists.

TOPOGRAPHY, FLORA AND FAUNA OF SOUTH AFRICA.

By C. B. Lowe.

This was an illustrated lecture on the physical geography of South Africa.

MISSOURI PHARMACEUTICAL ASSOCIATION.

The Missouri Pharmaceutical Association held its twenty-second annual meeting at Pertle Springs, Warrensburg, June 12th to 15th, inclusive. The attendance was very large.

President H. M. Pettit, of Carrollton, delivered an exceptionally able address. He reviewed the trade conditions, legislative matters, and the recent U.S.P. and A.Ph.A. conventions. Special attention was called to the coming meeting of the A.Ph.A. in St. Louis, September, 1901. Tributes were paid to the deceased members, and special mention made of the late Messrs. F. W. Sennewald and W. E. Barth. The good work of the N.A.R.D. was heartily commended. Treasurer Wm. Mittelbach, of Boonville, reported a balance of over \$200 on hand, the total expenses for the past year being \$622.12. The total list of members was 377, many of whom are to be dropped for non-payment of dues. Secretary H. M. Whelpley, of St. Louis, presented his report covering the work in that office for the past year. On account of the financial condition of the Association and the urgent desirability of meeting the N.A.R.D. assessment, the Secretary recommended that his salary be reduced from \$100 to \$50 per year, which, after considerable discussion, was adopted. Francis Hemm, Chairman of the Committee on Papers and Queries, presented the following list of papers, which were read and discussed :

(1) "The Artificial Manufacture of Diamonds," J. F. Llewellyn, Mexico.

(2) "A Few Notes on the Microscope in the Drug Store," H. M. Whelpley, St. Louis.

(3) "Practical Pharmaceutical Notes and Observations," Francis Hemm, St. Louis.

(4) "Mescal Buttons," J. F. Llewellyn, Mexico.

(5) "Photography in Pharmacy," Ambrose Mueller, Webster Groves.

(6) "Points on the Assay Processes of the U. S. Pharmacopœia," Francis Hemm, St. Louis.

(7) "Comments on the Revision of the U. S. Pharmacopœia," Wm. Mittelbach, Boonville.

(8) "Hydrargyrum cum Cretæ," Carl Hinrichs, St. Louis.

Mr. F. R. Scharlach, of Moberly, Chairman of Committee on Deceased Members, reported six deaths during the past year. This was followed by a memorial session of the convention. The pharmacists in the United States employ were given attention, and resolutions adopted, copies of which will be forwarded to the Government officials. A sample of the new Epitome of the National

Formulary, just published by the A.Ph.A., was exhibited and discussed. The Association urged its members to procure copies for distribution among physicians. Otto F. Claus, Chairman of Committee on Membership, presented seventeen applications. C. F. G. Meyer, of St. Louis, reported as a delegate to the Pure Food and Drug Congress. The Association reaffirmed its position in favor of pure food and drugs. The N.A.R.D. was represented by the Chairman of the Executive Committee, Mr. F. E. Holliday, who addressed the Association, which had previously voted to pay its assessment of 50 cents per member. The following officers were elected for the coming year: President, Paul L. Hess, Kansas City; Treasurer, Wm. Mittelbach, Boonville; Secretary, H. M. Whelpley, St. Louis; Assistant Secretary, Ambrose Mueller, Webster Groves; Local Secretary, J. V. Murray, Warrensburg; Council, H. M. Pettit, Carrollton, Chairman; R. L. Hope, Centralia, Vice-Chairman; Chas. L. Wright Webb City, Secretary; J. M. Love, Kansas City; A. Brandenberger, Jefferson City.

A. T. Fleischmann, Secretary of the Board of Pharmacy, presented his annual report, which showed that that body had held five meetings during the past year, at which 246 candidates had been examined, of which 109 were registered. The Board received \$650 from all sources during the year, which was used in meeting its expenses.

R. L. Hope, of Centralia, Chairman of the Committee on Exhibits, reported the names of fourteen exhibitors. The Hollwood Cash Register Company, of Dayton, O., donated the Association a \$100 register, which was quickly sold to one of the members and the proceeds turned into the treasury.

Wm. Mittelbach, of Boonville, Chairman of the Committee on U. S. Pharmacopœia, made a report which, in connection with other papers on the Pharmacopœia, was discussed and referred to Dr. Chas. Rice, Chairman of the Committee on Revision. A. T. Fleischmann, Chairman of the Committee on Legislation, asked the Association for instructions. It was decided to make no effort to amend the present pharmacy law. The Query Box was opened, and a number of practical questions discussed. The Committee on Time and Place of Meeting, through its Chairman, J. M. Love, of Kansas City, reported in favor of Pertle Springs, the time to be in the month of June, but the exact date to be decided by the Council. After

the installation of officers, President Hess announced the following chairmen of the different committees: Membership and Attendance, F. R. Scharlach, Moberly; Papers and Queries, Francis Hemm, St. Louis; Legislation, J. M. Love, Kansas City; National Formulary, F. L. Crampton, Kansas City; Trade Interests, E. G. Schroers, St. Joseph; U.S.P., J. F. Llewellyn, Mexico; Exhibits, Henry Riddel, Kansas City; Deceased Members, P. H. Franklin, Moberly; Drug Adulterations, Ambrose Mueller, Webster Groves; Transportation, H. W. Servant, Sedalia.

MARYLAND PHARMACEUTICAL ASSOCIATION.

The eighteenth annual meeting of the Maryland Pharmaceutical Association was held at Hagerstown, June 19-22, 1900.

The sessions were opened with an address of welcome by Mayor E. M. Schindel, a prominent druggist of Hagerstown, to which Henry P. Hynson replied and said, among other things, that the State of Maryland had not shown appreciation of pharmacy by throwing around it laws for its protection, such as had been enacted in other States. After the transaction of routine business, A. R. L. Dohme, the retiring President, read his annual report.

He said the membership had been increased from 132 to 167, and that the unsuccessful efforts to secure a pharmacy law for Maryland was not work done in vain, and its good effects would be shown in the future.

Concerning the question of further increasing the membership of the Association, Dr. Dohme said: "If we could only get our membership up to a fair proportion of the total number of pharmacists in the State, we would have a much better opportunity and standing before the Legislature, when we appear before it in behalf of a bill we are offering. During the past year an effort was made by the local branch of the N.A.R.D. to bring about more friendly relations between the retail and wholesale druggists of Baltimore. It was not entirely successful. The so-called card system of the N.A.R.D. has been inaugurated in Baltimore, but also without success, and justly so. Until all the jobbers of Baltimore and the neighboring large cities can be brought into line, and until at least 90 per cent. of the retailers can be induced to agree to the system, it is unreasonable to expect either side to subscribe to it. Until the organization of the N.A.R.D.

becomes more general all over the land, it is useless to expect it to succeed in a large city. It is absolutely impossible to expect to attain a perfect system of checking the cutting of prices. * * * I believe that there are to-day among the professed friends of the rebate system in the wholesale and retail drug trade, and especially among those who are working for its success, and condemn its violation in speech and in print, persons and firms who are making considerable money by surreptitiously supplying cutters all over the land with goods of all descriptions. This is nefarious, but how it can be prevented by law is beyond my ability to suggest."

He advised a continuation of the agitation in favor of repealing the war-revenue law and commended the action taken by the National Pure Food and Drug Congress. He also suggested a change in the manner of selecting meeting places, that instead of going from place to place it would be better to select Ocean City for the Eastern shore and Blue Mountain House for the Western shore, meeting at these places alternately.

Secretary Charles H. Ware's report stated that the Association had 153 members, with a number of applications to be acted upon. An interesting report on trade interests was submitted by H. P. Hynson. He recommended the formation of a commercial league, to be a part of the Maryland Pharmaceutical Association. Mr. Hynson said there were three branches of the trade represented in the Association—the retailer, wholesaler and manufacturer—and argued that each of these three branches should be brought into closer touch with every other branch through the proposed committee, with the result that a larger measure of co-operation could be secured. The matter was referred to the Committee on Laws.

The report of the Committee on Adulterations was made through Dr. Daniel Base, who submitted several samples of adulterated drugs, after which Dr. Church, of Church Falls, Va., was introduced and made an address on the Virginia Pharmaceutical Association.

Mr. Hynson, acting for a committee of six, three members representing the Maryland Medical and Chirurgical Faculty and three the Maryland Pharmaceutical Association, submitted a set of rules to govern the relations between the two professions. They provided that pharmacists shall refuse to prescribe for customers, except in emergency cases, and that physicians shall carry emergency remedies only; that substitution shall not be resorted to; that physicians

shall regulate their charges and pharmacists shall do likewise; that pharmacists shall not refill prescriptions when directed by physicians not to do so; that druggists shall see physicians before filling prescriptions supposed to contain errors, and that pharmacists shall not disclose the contents of prescriptions to customers. These regulations were approved, the only one rejected being the requirement that druggists need not put caution labels on bottles unless directed to do so by physicians.

Louis Schulze read a paper on free dispensaries. He said that these institutions were abused by the well-to-do, and recommended the appointment of State physicians to visit the indigent sick. This paper was referred to the joint Committee of Physicians and Pharmacists. J. C. Muth, of Muth Bros. & Co., reported that statistics gathered in the State showed that the sale of patent medicines has undergone a slight decrease.

On Friday the proceedings opened with the reading of the report from the Committee on Pure Food and Drugs, which encouraged support of the efforts to secure national legislation on the subject. Dr. Dohme read a paper on "What Have Been the Causes Preventing the Enactment of a Pharmacy Law for Maryland." "Are Headache Remedies Containing Acetanilid Dangerous?" was a subject discussed by J. Emory Bond. It brought out some remarks by W. C. Aughinbaugh and others, who advised that these remedies be used with caution.

At the afternoon session the Committee on Trade Interests made its report. It recommended that the Maryland Association continue to support the N.A.R.D. Robert S. McKinney, Taneytown, Chairman; W. C. Powell, Snow Hill, and H. P. Hynson and J. G. Beck, Baltimore, were appointed a Board of Directors of the Retail Druggists' League, to be formed as an adjunct to the Maryland Pharmaceutical Association. Non-members as well as members of the State association may belong to the new league, which has for its object the organization of all the retail druggists in Maryland.

J. M. Kenney read a paper in reply to the query, "What is the Best Preservative for Fruit Juices?" He said that formaldehyde was as good as anything.

H. Lionel Meredith, Hagerstown, read a paper on some experiments with glucose and glycerin in syrup ferrous iodide.

The following officers were elected: President, W. E. Turner,

Cumberland; Vice-Presidents, L. H. Mobley, Hagerstown; J. F. Leary, Rock Hall; W. E. Brown, Baltimore; Secretary, Louis Schulze, Baltimore; Treasurer, William M. Fouch, Baltimore; Executive Committee, H. R. Rudy, Hagerstown, and O. C. Smith and J. Emory Bond, Baltimore.—From *Pharm. Era*, 1900, 712.

NEW JERSEY PHARMACEUTICAL ASSOCIATION.

The thirtieth annual meeting of the New Jersey Pharmaceutical Association was held at Asbury Park, May 23-24, 1900.

After an address of welcome by Hon. F. T. Appleby, the President, W. C. Alpers, then read his annual address, in which he said the business outlook was brighter than for many years past. He said he had experienced the greatest difficulty in getting members of the Association to serve on the Query Committee. To overcome this difficulty a more vigorous policy was needed. Provision should be made for this committee to send out questions early to members of the Association and to keep at it. The committee should also collect facts bearing on the progress of pharmacy, adulteration and methods of analysis for their determination, etc. He reported that the Association had to its credit \$2,300, with an annual income from dues amounting to \$375. The annual expenditures amount to \$475, and he urged greater economy in the matter of expenses.

The proposition of the Pabst Brewing Company, of Milwaukee, to allow an additional discount or rebate to associations on goods sold to their members was denounced as an "advertising scheme," and he advised the Association to authorize the return of the check sent by that corporation to the society. The work of the New Jersey Board of Pharmacy was heartily endorsed. He believed a thorough general education should be required of applicants, and the legal establishment of such educational requirements was more necessary than anything else in the development of pharmacy. He indorsed the "model law" adopted by the American Pharmaceutical Association at its last meeting, and said that the New Jersey pharmacy law came nearer to this draft than that of any other State. The recommendation that hospital stewards in the National Guard be registered pharmacists and be accorded commissions, as recently authorized in New York, he also endorsed. The Local Sec-

retary should be made an officer of the Association, and the order of business prescribed by the constitution should be changed.

In closing his address, the President recommended the Association to sever its connection with the National Association of Retail Druggists. The experiences of the past year had not verified the predictions made by the national organization. "The N.A.R.D. gives nothing but promises," he said. "It is the retailer who is called upon to make all of the sacrifices, while the jobber gets all the profits and the manufacturer risks but little." Then, too, he thought the membership of the Association in the N.A.R.D. was unconstitutional.

The address was referred to a committee consisting of Messrs. Holzhauser, Bye and Merritt.

The Secretary and Treasurer then read their annual reports, showing a net membership of 364, with a cash balance on hand of \$2,411.46. Henry A. Jordan, of Bridgeton, read his report as Secretary of the New Jersey Board of Pharmacy. The board held fifteen meetings during the year, and he was glad to report that applicants taking the examination showed better preparation for the work than ever before. Out of 107 who had taken the examination, 53 were college graduates. There were 1,539 registered pharmacists and 97 assistant pharmacists in the State.

After a Nominating Committee was appointed, the credentials of delegates from other pharmaceutical organizations were read. A motion to receive them and to grant the delegates the privilege of the floor was followed by a sharp discussion over the latter clause of the motion, and the "privileges of the floor" were not granted. It was a cold reception for the visiting delegates, and when they were asked if any of them had anything to say and the Association would listen to them, not one responded. Dr. Brundage, a delegate from Brooklyn, and also a member of the New Jersey Association, protested against this action, but his protest did no good. The opponents to granting the privileges of the floor to visiting delegates did not want the latter, among whom was Prof. W. C. Anderson, Vice-President of the N.A.R.D., to debate the plan of the national organization.

Then followed a report from the delegate to the meeting of the N.A.R.D., J. C. Gallagher, of Jersey City. Here the fight over the N.A.R.D. began again, the opposition being led by Charles Holz-

hauer, of Newark. By a vote of 22 to 14, the report was laid on the table, and another motion was passed making the question of remaining in the N.A.R.D. the first order of business for the following day.

Mr. Holzhauser read the committee's report on the President's address, and then the ball was started rolling by J. C. Gallagher, who moved "that the dues of this Association to the N.A.R.D. be paid." The resolution was violently opposed by Messrs. Holzhauser, White, Ryerson and the retiring President, W. C. Alpers, and most eloquently defended by Messrs. J. C. Gallagher and Frank O. Cole.

The resolution was lost, and by a vote of 14 to 29 the Association decided to withdraw from the National Association of Retail Druggists. It, however, passed another resolution favoring the plan of the National Association of Retail Druggists, and authorized the incoming President to appoint a committee of three members for each county to form local associations to co-operate with the national organization. The Secretary was authorized to ascertain the present indebtedness of the New Jersey Pharmaceutical Association to the N.A.R.D., and, if any such there be, the Association shall pay the amount.

The Committee on Membership reported the names of twenty-five new members. Reports from delegates to the American Pharmaceutical Association, the National Wholesale Druggists' Association, Pure Food and Drug Congress, U. S. Pharmacopœial Convention, and other associations were read and referred to the Publication Committee. A resolution, growing out of the discussion over the action of the New Jersey Board of Pharmacy in attempting to secure legislation last winter without "consulting the Association," was passed "that the Association considers it inadvisable for any of its members to attempt to introduce any legislation affecting pharmacy without the sanction of the Association."

The officers elected were: Stephen D. Woolley, Ocean Grove, President; D. L. Cameron, Rutherford, and James Foulke, Jersey City, Vice-Presidents; Frank C. Stutzlen, Elizabeth, Secretary; James C. Field, Somerville, Treasurer, and H. P. Thorn, Medford, and G. T. Fitzgeorge, Trenton, as new members of the Legislative Committee.

Executive Committee: D. L. Cameron, W. C. Alpers, Geo. H. Whipple, C. R. Priest and J. W. Merritt. Names from which to

select a member of the Board of Pharmacy, H. A. Jordan, Charles Holzhauser, C. A. Bye, W. F. Fox and R. Killgore.—*Ibid.*, 1900, p. 596.

NEW YORK STATE PHARMACEUTICAL ASSOCIATION.

The twenty-second annual meeting of the New York State Pharmaceutical Association was held at Newburgh, June 26–29, 1900.

The President in his address said that he was glad to see that fraternal feeling had wiped out petty jealousy, so that now local associations could be organized much more readily than ever before. He was pleased to see that organization was the order of the day, as druggists had been working single-handed too long. By acting together druggists would not only better their own positions, but would stand higher in the eyes of the public.

Regarding the N.A.R.D. the President said that it had done much toward establishing a better understanding between the wholesalers and manufacturers and the retailers. New York had been well represented at the Cincinnati meeting. He had attended and was very favorably impressed, and bespoke the kindly consideration of the New York State Association for this national organization. The work done by Thomas Stoddart before the Ways and Means Committee of Congress in the matter of the proposed repeal of the stamp tax law was alluded to.

Twenty years' labor of the Association in the direction of securing an all-State pharmacy law had at last shown results and the law was now on the statute books. Difference of opinion in the druggists' own ranks had prevented an earlier consummation of this desirable legislation, and when it had come it was an agreeable surprise all around. To R. K. Smither, of Buffalo, and Assemblyman Hill was due the chief credit for this statute, and he asked for it a fair trial, feeling sure that it was an improvement over the old laws. The appointment of the members of the board had been kept out of the hands of the Governor for fear that politics would creep in; he hoped that pharmacists would not disgrace the Association by infusing their politics into the board. He complimented the old State Board for the immense amount of work it had accomplished under a rather indifferent law.

About the matter of pharmaceutical education the President had

a good deal to say. He recommended that after 1905 no candidate be examined for board license who was not a graduate of a college of pharmacy. He estimated that 95 per cent. of physicians supplied 90 per cent. of their patients with medicines. This should not be so. It was the natural right of pharmacists to supply medicines and this right should be guaranteed by law.

The President recognized in travelling men a means of extending the membership of the Association. He suggested that in each town where there were five or more members, one of that number be appointed a collector of dues, and have an allowance of 10 per cent. for his trouble.

He recommended that the proceedings be made less elaborate and that the expense of publishing them be paid by the Board of Pharmacy.

It was a violation of the constitution for the time and place of meeting to be selected by anybody other than the Association itself, and Mr. Muench recommended that in future the Association fix its own time and place of meeting.

The Secretary is an *ex-officio* member of the Executive Committee, and had all the rights and privileges of such, but the President recommended that as four members might be equally divided on a question, the constitution be amended so as to state that the Secretary shall not have a vote as a member of the Committee.

In his peroration President Muench urged all the members to stand shoulder to shoulder and work unselfishly for the upbuilding of pharmacy.

The Committee on President's Address approved of the President's recommendations and remarks relative to the N.A.R.D., stamp tax, All-State Pharmacy Law, work of the old board, and that the President and Secretary be *ex-officio* members of the Executive Committee. The President's suggestion in the diploma prerequisite matter was also approved, save that the time when this should become operative should be made 1903 instead of 1905. The proposition that the newly-created State Board of Pharmacy pay for printing the proceedings of the Association was not favored.

Mr. Smither offered a resolution providing that the new Legislative Committee shall prepare for presentation at the next annual meeting the draft of a bill which shall include the diploma pre-

requisite (operative in 1905), shall require regents' examination for entrance into colleges of pharmacy, and that a method be devised for some form of State control over the standard of the colleges. The latter sections of this resolution were generally considered most important steps toward the attainment of a higher and better educational and legal pharmaceutical standard.

A resolution was adopted thanking the Governor for signing the bill increasing the rank and pay of the hospital stewards in the State militia.

G. Michaelis, of Albany, read the report of the Committee on Adulterations. The general average quality of drugs in this State was found better than heretofore and gradually improving. The report urged work to secure the passage of the Brosius Bill, as State measures were useless without Federal legislation. If the Brosius Bill passes there will be no further need for this committee in this Association. A tabular statement was given showing the character of a large number of articles examined during the past year. A large part of the report consisted of abstracts from the annual report of the chemist of the United States Department of Agriculture.

The Committee on Pharmacy and Queries announced several papers: "Prescription Incompatibilities in Every-day Practice," by W. J. Robinson, New York; "Shop Notes and Dispensing Hints," W. A. Dawson, Hempstead; a paper by C. S. Ingraham, Elmira, requesting establishment of a standing committee on formulas; "Tendencies in Pharmacy," A. B. Huested, Albany; "Botanical Nomenclature," W. A. Bryan, Brooklyn; "History of the New York State Pharmaceutical Association," C. W. Holmes, Elmira. All these papers were read by title and referred for publication.

The following officers were elected:

President, Felix Hirseman, New York; First Vice-President, Thos. Stoddart, Buffalo; Second Vice-President, J. F. Van Nort, Elmira; Third Vice-President, Clarence Miller, Newburgh; Secretary, J. B. Todd, Ithaca; Treasurer, T. W. Dalton, Syracuse; Executive Committee, J. A. Lockie, Buffalo; A. C. Searles, New York; Frank Richardson, Albany.—*Pharm. Era*, July 5, 1900; and *Drug. Circ.*, July, 1900.

ALABAMA PHARMACEUTICAL ASSOCIATION.

The nineteenth annual meeting of the Alabama Pharmaceutical Association was held at Mobile, May 15th-16th. President P. C. Candidus recommended that the Association should co-operate with the N.A.R.D., and also that the members should work to secure the repeal of the stamp tax on medicines. The President's address, which also contained other recommendations, was referred to a committee for consideration, and, at the last session, the Association decided to re-enter the National Association of Retail Druggists, and the Secretary was authorized to telegraph the information to the headquarters of the National Association. The co-operation of the Association was pledged to the movement to secure more recognition and better pay for the pharmacists in the Marine Hospital Service. A committee, consisting of Messrs. McVay, Brigham and Braun, was appointed to consider the feasibility of adopting a formulary for use throughout the State. The committee reported favorably, and the President, Secretary and Executive Committee were instructed to issue during the coming year such a work. The following officers were elected: President, G. B. McVay, of Birmingham; Vice-Presidents, Thomas W. Peagler, of Greenville; R. H. Stickney, Jr., of Anniston; Secretary, L. S. Brigham, of Montgomery; Treasurer, E. E. Elam, of Anniston; Local Secretary, J. D. Burke, of Montgomery; Executive Committee, W. E. Bingham, Tuskaloosa, A. E. Brown, Mobile, and C. B. Goldthwaite, of Troy. A motion to increase the dues to \$1.50 per member was lost. Montgomery was selected as the place for holding the next meeting.—*Pharm. Era*, 1900, p. 597.

ARKANSAS ASSOCIATION OF PHARMACISTS.

The Arkansas Association of Pharmacists held its annual meeting at Little Rock, June 11th and 13th. Interesting papers were read by J. H. Chestnutt, Hot Springs, W. W. Kerr and J. W. Beideman, Little Rock. Resolutions were adopted for a closer affiliation with the National Association of Retail Druggists, and memorializing Congress to abolish the stamp tax on patent medicines. The following officers were elected: President, E. F. Klein, Hot Springs; Vice-Presidents, W. L. Dewoody, Pine Bluff, and M. A. Eisele, Hot Springs; Secretary, James A. Ginocchio, Little Rock; Treasurer,

John A. Jungkind, Little Rock; Executive Committee, Charles K. Lincoln, J. B. Bond, Jr., and J. F. Dowdy, Little Rock. The next meeting will be held May 21, 1901, in Little Rock.—*Ibid.*, June 28, 1900.

COLORADO PHARMACAL ASSOCIATION.

The Colorado Pharmacal Association held its annual meeting at Manitou, June 13th and 14th. Several business sessions were held, the annual address being delivered by C. L. Prowitt, of Denver. The following officers were elected: President, Charles E. Barnes, Denver; Vice-Presidents, W. L. Shockey, Cripple Creek; Daniel Y. Wheeler, Denver; Treasurer, J. F. Fezer, Greeley; Secretary, Charles E. Ward, Denver; Local Secretary, F. B. Fox, Manitou. Fred J. Hill, of Salt Lake, was elected an honorary member. Manitou was chosen as the place for the next annual meeting, and the dates June 18th, 19th and 20th selected as the time. The Auxiliary Association, comprising the ladies of the Association, and known as the "Silent Partners," elected the following officers: President, Mrs. Charles Ford, Denver; Vice-Presidents, Mrs. Charles Ward, Denver; Mrs. Harry Canfield, Leadville, and Mrs. Hatfield, Colorado Springs; Corresponding Secretary, Mrs. L. Bridaham, Denver; Recording Secretary, Mrs. J. J. Cronin, Denver.—*Ibid.*, June 28, 1900.

CONNECTICUT PHARMACEUTICAL ASSOCIATION.

The annual meeting of the Connecticut Pharmaceutical Association was held at Hartford on June 12th-13th.

Following the reception of delegates and various routine business came the President's annual address. In it President C. F. Williams reviewed briefly the results of the year and urged the importance of membership in the Association from a professional point of view. The efforts during the past year to increase the membership had been very satisfactory. The present roll includes about 300 names. There had been no legislative matters to receive attention during the year, as the General Assembly had not been in session.

The Chairman of the Legislative Committee made a report in which were discussed the various laws pertaining to the regulation of liquor sales by druggists in the States of Massachusetts, New York

and Connecticut. The cost of a druggist's liquor license in Connecticut is \$50, in Massachusetts the cost is merely nominal, \$3.50 being the figure, while in New York State the cost of a storekeeper's license varies according to the locality, \$200 being charged in Manhattan, \$100 in Brooklyn, and correspondingly less in the smaller cities and villages. It appears that liquors cannot be dispensed on prescription in Connecticut unless the druggist holds a liquor license costing him \$50. A license entitling druggists in the State of New York to dispense whiskey and similar alcoholic beverages on prescription, the same being an ingredient of a mixture of other substances, costs but \$5 uniformly throughout the State. The question of the constitutionality of the State exacting a liquor license tax on prescriptions was discussed and some difference of opinion was expressed. On motion, the Chairman of the Committee on Legislation was empowered to represent the Association at the sessions of the Legislature and employ counsel in his discretion.

Chas. W. Whittlesey, of New Haven, addressed the members by request of President E. C. Frisbie, of the National Wholesale Druggists' Association, as a delegate from that body, and expressed considerable satisfaction at the agreement which had been reached between the three branches of the trade in regard to the distribution and sale of proprietary medicines.

The N.A.R.D. was endorsed, and John K. Williams read two papers, one on "Soda Water Syrups and their Serving" and the other "Notes on Every-day Pharmacy."

The following officers were elected: President, Charles S. Finch, Stamford; First Vice-President, Charles Fleischner, New Haven; Second Vice-President, Nathaniel K. Morgan, Hartford; Secretary, Charles A. Rapelye, Hartford; Treasurer, John B. Ebbs, Waterbury.—*Amer. Drug.*, 1900, p. 411.

INDIANA PHARMACEUTICAL ASSOCIATION.

The nineteenth annual meeting of the Indiana Pharmaceutical Association was held at South Bend, June 13-15, 1900. President F. D. Warner, New Carlisle, delivered the annual address, and said among other things:

"I have the pleasure of presenting to you a review of the past years,

progress. The past year has been the most eventful one in the Association's history. At our last annual meeting the pharmacy bill, a measure for which we are responsible, had not become a law. It was then awaiting the action of the Senate. However, so confident were we of its passage that measures were taken which resulted in the selection of a list of representative members. By further action of the meeting the names were placed in my hands to present at the proper time to His Excellency for his approval. Your instructions were faithfully carried out. While the Governor failed to comply with our recommendations in full, he is to be congratulated on his wise and very able selections. By this measure becoming a law we have been transformed from plain, every-day druggists into registered pharmacists, and with the restrictions and limitations it imposes it also confers a certain amount of professional dignity that we have not heretofore enjoyed. In times past pharmacy was a profession only; now it is both a profession and a trade, and the successful pharmacist must be one who can combine professional dignity with mercantile ability. Hence, to my mind, the importance of the Association developing and making more prominent the commercial interests of the pharmacist."

The President dwelt on the action of the Association in protesting against the proprietary men putting up prices because of the stamp act, its vigorous action being alleged to be one of the principal factors in bringing about the organization of the N.A.R.D. He also spoke of the unsatisfactory and impracticable features of the present liquor law, as far as it related to pharmacy, and suggested an amendment that would place the sale of liquor for strictly medicinal purposes under the control of the State Board of Pharmacy.

Among the papers presented were the following: "Some Data on How the Pharmacist Can Save Money by Being His Own Manufacturer," by Edmund A. Geyer, South Bend; "Business Methods," by Otto Gross, Fort Wayne; "Peppermint," by Leo Eliel, South Bend; an interesting talk on "The Cultivation of Peppermint," by Philip Holler; "Surface Tension," by John H. Cloud; a humorous paper on "How Long Will Phosphorus Pills Keep?" by J. N. Hurty.

The following officers were elected: President, F. W. Meissner, La Porte; First Vice-President, Otto Bastian, South Bend; Second Vice-President, D. H. Lohman, Lafayette; Third Vice-President,

Ernest Stahlhuth; Secretary, A. Timberlake; Treasurer, Frank H. Carter; Executive Committee, Frederick H. Burton, Evansville; W. O. Gross, Fort Wayne, and F. E. Wolcott, Indianapolis.—*Ibid.*, 1900, p. 412.

MASSACHUSETTS PHARMACEUTICAL ASSOCIATION.

The annual meeting of the Massachusetts Pharmaceutical Association was held at Newburyport, June 19–21, 1900. The address of the President, William D. Wheeler, contained a number of recommendations, which were reported upon as follows by the committee having the address under consideration:

That the Association continue its membership in the National Association of Retail Druggists; that the United States Government be memorialized urging the raising of hospital stewards in the army to the rank of commissioned officer; that a committee codify the pharmaceutical laws; that \$100 be appropriated for the Legislative Committee; and that the law be so amended that the State Board can no longer revoke certificates of pharmacy, but may suspend them.

The following officers were elected: President, F. A. Hubbard, of Newton; Vice-Presidents, L. E. Heinritz, of Holyoke; W. J. Bullock, of New Bedford, and Charles L. Davis, of Newburyport; Secretary, J. F. Guerin, of Worcester; Treasurer, Thomas B. Nichols, of Salem; Trustees of Permanent Fund, F. E. Mole, of Adams; Henry Canning, of Boston, and J. H. Whitney, of Great Barrington.

George M. Hoyt, of Weymouth; Fred A. Hubbard, of Newton, and Thomas B. Nichols, of Salem, were nominated for the vacancy on the Board of Pharmacy, which will occur October 1st. These three names will be presented to the Governor by a committee of twenty-five members of the Association.

J. J. Curran presented a resolution memorializing the State authorities regarding the commissioning of hospital stewards in the State militia and endorsing the stand taken by the American Association with regard to the same being done in the United States army. It was unanimously adopted.

T. T. Drake read a paper on the drugs and chemicals that varied from the standard of strength and purity which have come under his notice during the past year.

Profs. Julian W. Baird and Robert T. Greenleaf, of the Massachusetts College of Pharmacy, were elected honorary members.

C. B. Emerson, of Haverhill, H. M. Whitney, of Lawrence, Amos Tilden, of Boston, and others who have been in the business for from twenty-five to fifty years, gave reminiscent talks of the changes in the drug business during their careers.—*Druggists Circular*, July, 1900.

OHIO PHARMACEUTICAL ASSOCIATION.

The twenty-second annual convention of the Ohio State Pharmaceutical Association opened June 19, 1900, at 8 o'clock P.M., in the Hotel Victory, Put-in-Bay, O., with President DeLang in the chair. The first session was devoted chiefly to the reading of the President's address, which was referred to a committee to report upon.

At the second session the report of the Pharmacopœial Committee was presented. Considerable discussion was had regarding the subject of courses of study in pharmaceutical colleges. The Association took action supporting the work done by George F. Payne, of the American Pharmaceutical Association, in raising the standing accorded to pharmacists in the army, navy and marine hospital service of the United States. It was resolved to notify the National Association of Retail Druggists of this society's endorsement of their views on the subject of trade-mark protection of foreign products. Joseph Feil read a very opportune paper on the progressive standard of education among pharmacists, entitled "The Next Step." A table and paper was presented by Prof. Theodore Wetterstroem, of Cincinnati, on the comparative alcoholic strength of proprietary articles. The Treasurer of the Association, Mr. J. H. von Stein, presented a prize paper entitled "What Constitutes a Good Member."

At the third session the discussion on the President's address was the chief feature, and this was followed by the report of the Ohio Board of Pharmacy, the Secretary's report, a prize paper on druggists' protective fire-insurance, by Mr. John Weyer, and the report of the Association Committee on Insurance. Officers for the ensuing year were elected, as follows: President, B. S. Young, Ada; First Vice-President, O. H. Garrett, Hillsboro; Second Vice-

President, J. O. Connor, Urbana; Executive Committee, J. H. Brinker, Bellevue; A. W. Kiler, Columbus; Albert Wetterstroem, Cincinnati; Permanent Secretary, L. C. Hopp, Cleveland; Permanent Treasurer, J. H. von Stein, Upper Sandusky. The following names were selected from which the Governor shall choose a member of the Board of Pharmacy: W. H. Miller, New Philadelphia; C. W. Tobey, Troy; W. H. Styer, Marietta; J. H. von Stein, Upper Sandusky, and Frank Amann, Portsmouth.

The fourth session was devoted to the discussion of trade protection and the formation of an auxiliary society among the druggists of the State for purposes of mutual protection and the furtherance of the legitimate drug business. Definite action was taken by the Association providing for the formation of such auxiliary society. The Committee on Pharmacy Laws was authorized to employ a person to watch out for hostile legislation and apprise the committee of it.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.

The Oklahoma Pharmaceutical Association held its tenth annual meeting at Shawnee, April 4-5. By reason of the absence of the President, W. R. McGeorge, F. R. Lillie, of Guthrie, occupied the chair. The meeting was well attended, and no pains were spared to make it a success.

Among the interesting papers read were: "What Our Association Does for the Druggist," by F. B. Lillie, of Guthrie; "How Are We to Increase Our Trade and Profit?" by J. C. Burton, of Stroud; "Keeping Stock," by W. B. Wheeler, of Guthrie; "Some Preparations Profitable for Oklahoma Druggists to Make," by C. R. Miller, of El Reno; "Notes from the N.A.R.D.; What it Has Done and What it is Doing for the Retail Druggists."

The following officers were elected for the ensuing year: President, C. A. Dow, Pond Creek; First Vice-President, J. C. Burton, Stroud; Second Vice-President, Fred Reed, Norman; Secretary, F. M. Weaver, Oklahoma City; Assistant Secretary, C. C. Pottenger, Shawnee; Treasurer, L. J. Hord, Ponca City; Local Secretary, J. W. Pryor, Oklahoma City. Oklahoma City was selected as next meeting place, and the date for the meeting fixed on the second Wednesday of May, 1901.—*Pharm. Era*, 1900, p. 597.

SOUTH CAROLINA PHARMACEUTICAL ASSOCIATION.

The twenty-fourth annual meeting of the Pharmaceutical Association of South Carolina was held on May 17th, at Charleston. Reports were read by the President, the Secretary and the Chairman of the Examining Board, in all of which the forward movement in pharmacy in this State was clearly shown. Memorial resolutions on the death of the late President, Peter Robertson, of Newberry, were read, and a touching tribute was paid to his memory as a pharmacist and a man. After routine business, the following officers were elected for the ensuing year: President, O. Y. Owings, Columbia; First Vice-President, John B. Johnson, Rock Hill; Second Vice-President, A. A. Kroeg, Charleston; Secretary and Treasurer, Frank M. Smith, Charleston; Solicitor, Hon. J. E. Burke, Charleston; members of the State Board, O. Y. Owings, Columbia; O. E. Thomas, Columbia; J. G. De Lorme, Sumter; Julian A. Barbot, Charleston; Edward S. Burnham, Charleston, Chairman; M. H. Sandifer, Rock Hill, Secretary.

TEXAS PHARMACEUTICAL ASSOCIATION.

The Texas Pharmaceutical Association held its annual meeting at Dallas, May 15th-17th. President Hazlett urged the Association to greater effort toward securing the passage of a pharmacy law which will meet all the requirements of the drug trade. He thought much good would come from the work of the National Association of Retail Druggists, and suggested the organization of local associations in every city and county to help the work along. The repeal of the stamp tax was also urged.

The Secretary and Treasurer, R. H. Walker, reported a cash balance of \$314. The Committee on President's Address approved the various recommendations made, and suggested that a committee be appointed to draft a law which will follow the bill drafted by the Association in 1898, and embodying the following points: That no certificate shall be issued to any person upon presentation of a diploma; that no one shall be allowed to present him or herself for examination before the Board of Pharmacy except he or she shall have had four years' experience, at least two of which shall have been spent in the compounding and dispensing of prescriptions under the supervision of a "registered pharmacist," or in lieu thereof upon

presentation of a diploma from a school of pharmacy. Evidence of experience as hereinbefore defined shall be certified to by a notary public.

The committee's report was adopted by the Association.

Reports of delegates to other associations were read, and a draft of the proposed amended pharmacy law was presented. The latter was fully discussed and finally referred to the Legislative Committee, with instructions to secure its passage by the Legislature. The proposed amendments to the present law governing the sale of liquor also came in for much discussion, and the matter was left in the hands of a committee to take such action as it thought proper to get the relief it believed the druggists should have.

The following officers were elected: President, J. L. Hazlett; Vice-Presidents, J. J. Schott, J. J. Thames and W. S. Kirby; Secretary, R. H. Walker; Trustee, George J. F. Schmidt. C. E. Craycroft, Sherman, was appointed Local Secretary for the next meeting. Seventy-eight new members were elected. The Association will hold its next meeting at Sherman on the third Tuesday in May, 1901.—*Pharm. Era*, 1900.

MINUTES OF THE QUARTERLY MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

The regular quarterly meeting of the members of the Philadelphia College of Pharmacy was held on June 25th, Mr. Howard B. French, President, in the chair.

Eighteen members were present.

Mr. French, in taking the chair, addressed the members briefly, expressing his thanks for the honor conferred in electing him President, and assuring them of his great desire to labor earnestly for the welfare of the College, and requested and expected the hearty co-operation of every member, and hoped that still greater success would attend their efforts in the future.

The minutes of the annual meeting, held March 26th, were read and approved. The minutes of the Board of Trustees for the meetings in April, May and June were read by the Registrar, Mr. W. Nelson Stem, and approved.

The report of the delegates to the American Pharmaceutical Association, held in Richmond, Va., May 7th-12th, was presented by Prof. C. B. Lowe. The delegates to the Convention to Revise the United States Pharmacopœia, held at Washington, D. C., May 2d-4th, reported verbally, through Prof. Joseph P. Remington. The proceedings of these bodies have been very fully reported in the AMERICAN JOURNAL OF PHARMACY, June Number, pages 276-308.

Mr. George M. Beringer read a memoir of Charles Bullock, the late President of the College. Mr. Wm. J. Jenks and Professor Remington also referred to

the services of Mr. Bullock, confirming from personal knowledge the statements made by Mr. Beringer.

The memoir was referred to the Committee on Publication.

The subject of the consideration of the revised By-Laws of the College was then presented, and, on motion, it was resolved to consider them at an adjourned meeting to be held July 10th.

A communication was read from Mr. H. N. Rittenhouse, expressing his appreciation of the vote of thanks tendered him by the College for his long service of twenty-five years as Treasurer of the Publication Committee.

Adjourned to meet July 10th, 3 P.M.

An adjourned meeting of the members of the Philadelphia College of Pharmacy was held in the Library, July 10, 1900, at 3 P.M., Wm. J. Jenks presiding. Twenty-one members were present.

The minutes of the quarterly meeting, held June 25th, were read and approved.

The consideration of the revised By-Laws of the College was then taken up and finally adopted as a whole.

A few important changes were made. Among the most important was that of making the first annual dues of \$5, on joining the College, begin at the Annual Meeting in March.

The subject of a revision of the Code of Ethics was then introduced, and, after discussion, was referred to the Committee on By-Laws, to propose any alterations that may be deemed necessary.

Mr. Boring alluded to the work performed by the Committee on By-Laws and proposed a vote of thanks for the promptness with which they had completed their work. Adopted.

C. A. WEIDEMANN, M.D.,
Secretary.

OBITUARY.

The Paris School of Pharmacy suffered extraordinary loss during the past spring, for between March 30th and April 21st three of its professors were called from their labors.

G. PLANCHON.

Best known in pharmaceutical circles was Prof. Gustave Planchon, Dean of the Pharmacy School, President of the Committee on Publication of the *Journal de Pharmacie et de Chinie*, ex-President and General Secretary of the Society of Pharmacy, and President of the Committee on Organization of the International Pharmaceutical Congress, held in Paris during last May.

The following is a brief sketch of his inspiring life, gleaned from eulogies pronounced at his funeral :

Born in the south of France in 1833, his early education was under the direction of his brother, Planchon, the botanist. He studied medicine at Montpellier, and, after carrying off honors each of his three collegiate years, obtained his M.D. degree in 1859, and a call as instructor from his *Alma Mater*. He was then called as Instructor of Botany to Lausanne, where he taught during 1860-1862. He then returned to Montpellier, where he won the Dr.Sc.

degree and an instructorship in 1864. In 1866 he was elected Professor of Materia Medica of the Paris School, a position which he retained to his death.

Planchon was a brilliant teacher, an able manager and an indefatigable worker. His contributions to science were numerous and valuable, while his two books, "Trait Practique de la Determination des Drogues Simples," 1875, and "Drogues Simples d'Origine Vegetale," 1895, are classics of pharmacy.

His last appearance was at the grave of his colleague, Professor Beaugard, where he, despite an attack of grippe, pronounced the eulogy. Immediately thereafter he sought recuperation at his old home, Montpellier, where he died April 16th.

H. BEAUREGARD.

H. Beaugard, a pupil of Planchon, was born in Havre in 1855. He studied at Paris science, medicine and pharmacy, his high scholastic record winning for him successively the positions of hospital interne, preparateur in natural sciences, laboratory instructor in chemistry and quiz-master in the natural sciences. In 1885 he added to his other duties that of naturalist in the laboratory of comparative anatomy, at the same time making investigations which brought him much distinction. Of special pharmaceutical interest was his work on spermaceti, ambergris and cantharidin. In 1898 he was given the chair of cryptogamic botany in the School of Pharmacy, and a most striking proof of his versatility was shown in the able manner in which he taught this branch, in which he had scarcely specialized. Two short years was he permitted to enjoy the highest fruits of his labor, for, on March 30th, he was called upon to lay his burden down.

A. MILNE-EDWARDS.

Alphonse Milne-Edwards, Professor of Zoology and Director of the Museum of Natural History, Paris School of Pharmacy, died April 21st. Reared among the rich collections of the Museum of Natural History, his entire career was devoted to the Paris School, to which he was called as professor in 1865, when scarcely thirty years old.

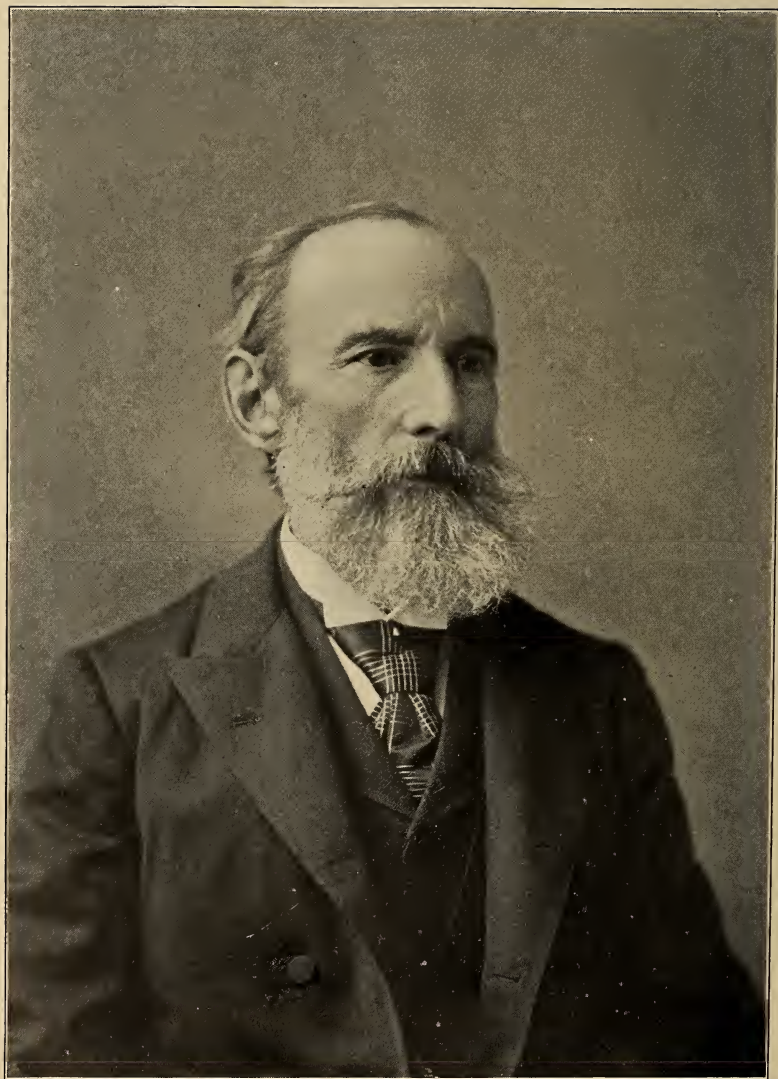
To him his science was his life, and recital of his achievements is at once the inspiration and the despair of his less gifted followers.

On submarine fauna he was unexcelled. Beside proving that animal life existed 1,200 fathoms beneath the surface of the sea (1860), he organized two scientific dredging explorations, under the auspices of the French Government, winning by his efforts the gold medal of the Geographic Society.

In 1869 he published a work on the fauna of the southern hemisphere, which has become a classic, it being given that high distinction, "couronné par l'Academie." He next turned to paleontology, the fossil crustaceæ being his first subject, and then the osteology of prehistoric birds, the latter work (1869-1871) bringing for him the grand prize of the Academy of Sciences. In his later years he studied the fauna of Madagascar.

H. V. ARNY.

CHLORINATED LIME.—The amount of chlorine in Calx chlorata is determined by Wolanski (*Ann. de Chim. Anal.*, 1900, p. 235), as follows: The solution of Calx chlorata (about 1 per cent.) is poured into 5 c.c. of a potassium iodide solution (0.1 per cent.) acidified with H₂SO₄. The iodine combines with the chlorine, forming ICl₃, and the solution becomes decolorized.



CHARLES BULLOCK.

THE AMERICAN JOURNAL OF PHARMACY

SEPTEMBER, 1900.

CHARLES BULLOCK, PH.M.¹

For the first time in the history of the Philadelphia College of Pharmacy are we called upon to record the decease of the President during his tenure of office.

Charles Bullock was a direct lineal descendant of John Bullock, a member of the Society of Friends, who emigrated from England in the very early part of the eighteenth century. His wife died on board the ship during the passage.

His second wife was Mrs. Susannah Parrott, whose maiden name had been Susannah Wright. The Wrights had acquired title to large tracts of land in New Jersey by purchase and deeds from the Indians.

The records show that in 1724 Elizabeth Parrott deeded to John and Susannah Bullock 200 acres in the township of New Hanover, Burlington County, N. J. He settled thereon and engaged in farming. Several hundred acres more were acquired by subsequent purchases. A large portion of this estate still remains in the possession of direct descendants.

For three generations the family continued in this peaceful occupation, happy in their unrestricted religious liberty and enjoying the most friendly relations with their fellow-beings.

On this old homestead, near Arneytown, N. J., John Bullock, the father of Charles Bullock, was born on January 14, 1785. He was wont to relate anecdotes of these early days and experiences, and as indicating the peaceful conditions of the surroundings, related that

¹ Read at the quarterly meeting of the Philadelphia College of Pharmacy, June 25, 1900.

the doors were not barred at night, and that it was no unusual thing for him, in his boyhood days, on coming downstairs in the early morning, to stumble over the prostrate forms of some of their Indian neighbors slumbering around the kitchen fire. He was a scholarly gentleman, and was married in 1821 to Rachel Griscom, the sister of Prof. John Griscom. He became principal of a select school for boys at Wilmington, Del. While apparently not established by the Society, yet from the devout character of the principal and associations it became known as a Friends' school, and received encouragement and support from many families of that faith.

It enjoyed an excellent reputation, and attracted many students from a distance and was particularly well patronized by students from the West Indies and South America.

To this couple was born in Wilmington, on February 25, 1826, a son, Charles Bullock, the subject of this memoir. He and an elder brother, Dr. Wm. R. Bullock, were the only ones of five children to reach maturity.

His early education was obtained at the school established by the monthly meeting of the Society of Friends, and afterwards he attended the school conducted by his father.

His uncle, Prof. John Griscom, was an enthusiastic and progressive teacher of chemistry. He is said to have possessed remarkable conversational ability, and was noted for his successful experiments in illustration of his lectures on chemistry. He spared no effort to obtain materials and apparatus, even importing these when necessary. On his visits to Wilmington, many of these lectures and experiments were repeated. In addition to his scholastic attainments, Charles' father possessed considerable mechanical skill and ingenuity, which he loved to apply to the construction of apparatus to illustrate the tuition of the school.

The visits of his uncle were greatly enjoyed by Charles, and with boyish enthusiasm he entered upon the study of chemistry and natural philosophy, electrical phenomena claiming special attention. His father's cabinet of apparatus, designed to illustrate the teaching of physics in the school, was at his command, and with a workshop fitted up with a lathe and the necessary tools at his disposal, he devoted most of his leisure time to improvising apparatus for his experiments.

These associations of his youth, undoubtedly, directed the trend

of his mind toward scientific study and experimentation, which was so pronounced throughout his entire career and determined his selection of pharmacy as a life calling because of its practical application of the sciences to which he was devoted.

At the age of 15, Charles was sent to Haverford College, then a school under the direction of the Society of Friends. It appears that he did not complete the course of instruction here. The decease of his mother at this time was probably the cause of his leaving college.

On May 1, 1844, he commenced his apprenticeship of four years with Messrs. Smith & Hodgson. He enjoyed the training of these excellent pharmacists, and in after years frequently referred to the carefulness, neatness and skilful manipulations of Mr. Hodgson in dispensing. With a determination to master thoroughly the duties of his position and the intricate knowledge of the business, he applied himself diligently, and with a mind trained to scientific study and possessing great natural ability, he profited exceedingly by his opportunities.

Entering the Philadelphia College of Pharmacy, he was graduated in the Class of 1847. His inaugural thesis was upon *Kalmia latifolia*, which, at that time, had attracted some attention among the medical practitioners. This paper was a carefully prepared and creditable work, and indicated his acquaintance with the methods of plant analysis then in vogue. It was published in the *AMERICAN JOURNAL OF PHARMACY*, 1848, page 360.

He continued in the employ of his preceptors until, in company with his friend, Edmund A. Crenshaw, they succeeded to the business.

This old and, at that time, well-known drug firm, Smith & Hodgson, deserves more than a passing comment. In 1819 Daniel B. Smith established his drug store at the northeast corner of Arch and Sixth Streets. At that time this was one of the most secluded and quiet localities in the city, and was largely occupied by the comfortable houses of the prominent members of the Society of Friends. The proprietor was noted for his scientific knowledge, literary attainments and practical philanthropy. His large acquaintance, natural ability and exemplary character enabled him to exert a great influence, which was largely applied in the directions of the advancement of scientific education and the establishment of

charitable institutions tending toward the improvement of the social and moral conditions of the needy.

At the first meeting of the Philadelphia College of Apothecaries, in 1821, he was elected Secretary, and continued as Secretary of the College for seven years. As chairman of the Publication Committee, Daniel B. Smith issued the first number of the *AMERICAN JOURNAL OF PHARMACY*, and contributed the initial original paper.

For a quarter of a century he served as President of the College, ever keeping acquainted with the growing needs of pharmaceutical education, and ever ready to counsel and give encouragement to the efforts of others.

In 1828, Wm. Hodgson, Jr., who had studied chemistry in England, and learned the drug business at the celebrated apothecary of John Bell & Co., Oxford Street, London, became associated in the business, and, for twenty years, the firm of Smith & Hodgson continued to do a thriving business. For years this was the only house in Philadelphia dealing in chemicals and apparatus. This portion of their business developed greatly, and their laboratory facilities here were inadequate. Desiring to engage more extensively in the manufacture of chemicals, in 1848 they built a laboratory on Gray's Ferry Road.

A number of the young men who entered the employ of Smith & Hodgson subsequently became prominent in chemical industries and influential in pharmacy. Among these may be mentioned Thomas Powers, Henry Pemberton, Charles Bullock and Wm. J. Jenks.

It is not surprising that Charles Bullock, at this period of his life, when character is moulded and business training is inculcated, should, probably unconsciously, absorb the impressions and many of the characteristics of his preceptors.

Smith & Hodgson, desiring to devote their attention to the development of their laboratory, decided to dispose of their drug business. Charles Bullock and Edmund A. Crenshaw, two of their employees, formed a copartnership, and, on January 1, 1849, Bullock & Crenshaw succeeded to the business. While Mr. Crenshaw devoted the major portion of his time to the development of the wholesale drug business, Mr. Bullock assumed charge of the department of chemicals and apparatus, and also the manufacture of pharmaceuticals and pure chemicals.

The decade immediately following their engagement in business was marked by an era of remarkable advance in the manufacturing and mining industries of the country. The practical application of chemistry in these industries also greatly stimulated study and research, and these young merchants found the supplying of chemicals and apparatus for laboratory and lecture purposes a profitable portion of their business.

During this decade, the wholesale drug department was also making rapid strides. Philadelphia, as the centre of medical education, attracted many students. As a large proportion of these came from country districts where drug stores were not convenient, it became quite a custom for the young physician before leaving Philadelphia to provide himself with an outfit of drugs. Bullock & Crenshaw published sets of labels and a price-list of outfits for office practice, medicine cases and the old-fashioned saddle-bag medicine cases at that time so much used by the country practitioners.

They enjoyed quite a large trade in this line, especially among physicians in the Southern States. The Civil War destroyed the credit of many of these Southern families, and as a result the firm sustained a serious financial loss.

In the summer of 1851 Charles Bullock made a trip to Europe, sailing from Philadelphia on one of the Cope Line clipper ships. He visited and studied the World's Fair, then in progress in London, noting with interest all relating to advancements in the arts and sciences. After a tour through Great Britain and Ireland, he travelled on the Continent, visiting all the important cities. On this trip he acquired valuable information regarding the customs, methods of business and manufacture, and established commercial relations for his firm with many of the prominent manufacturers of philosophical apparatus and chemicals for technical and laboratory work. He returned to New York on one of the Collins Line steamships, the "Humboldt," in the autumn of 1851.

Bullock & Crenshaw were the first manufacturers in Philadelphia of sugar-coated pills, and for years did an extensive business in these.¹ On the introduction of fluid extracts, they engaged in their manufacture, and in each one decided by experimentation upon the proper method and correct menstruum to be used. Their line of pharmaceutical products included also extracts, syrups, elixirs and tablets.

For some years they owned and manufactured Osborn's water colors, which were said to be fully equal to any of foreign manufacture.

The growth of their business necessitated more room, and through the interest of Thos. Powers the property now known as 528 Arch Street, previously occupied by the S. S. White Dental Manufacturing Company, was secured, and also the property in the rear, 531 North Street.

A four-story brick connecting building was constructed and the entire property remodelled and refitted, and in September, 1868, they removed to this location, where they have since continued.

A retail apothecary and dispensing department has always been maintained. Following the old custom of the trade, the firm has employed and given practical instruction to a great many apprentices, and has always encouraged these to take advantage of the scientific education offered by the College. It is doubtful if any other firm has been preceptor to so large a number of the students of the Philadelphia College of Pharmacy.

For more than fifty years this firm has continued in business, and the principles of honest, conscientious discharge of every duty pertaining to their calling, either as dispensing pharmacists, manufacturers or merchants, were grafted so thoroughly and impressively upon all their dealings that they established an exemplary business reputation.

Always careful in the selection of quality in their purchases, using the purest materials only, and insisting upon maintaining the most exacting requirements of the methods of preparation and dispensing, their products enjoyed the confidence of both physician and pharmacist.

Charles Bullock was an educated pharmacist of the old school, who realized the importance of his calling, and aimed to be an honor thereto. He was not devoid of ambition, and while he strove for financial success, nevertheless the mere acquirement of wealth had but a secondary place in his efforts, and in this direction his friends and business associates thought him entirely too conservative. He especially deprecated the introduction of patent medicines and proprietary remedies into pharmacy. Their rapid increase in number only increased his distaste for this class of preparations. This feeling finally became so pronounced that some years ago he decided to eliminate them entirely from their jobbing business.

In 1849, Charles Bullock became a member of the Philadelphia College of Pharmacy, and shortly thereafter was elected a Trustee. On September 24, 1864, he was elected Recording Secretary of the College, to succeed Edward Parrish, who had just been elected to the chair of Materia Medica made vacant by the decease of Dr. R. P. Thomas. He discharged the duties of Secretary with marked ability until March 31, 1873, when, in a letter to his associates, he asked to be relieved. On March 30, 1874, he was elected First Vice-President, and on March 30, 1885, was chosen as President, to succeed Dillwyn Parrish, who resigned on account of advancing years.

At the annual meeting of the College in 1898, upon accepting the re-election as President, he feelingly referred to his love for and interest in the success of his *Alma Mater*, but impressed upon his fellow-members that he desired to be relieved at the expiration of the year's service, as he felt that age was telling upon him and that his energy was no longer equal to the responsibilities placed upon him. At the next annual meeting he reiterated his determination to retire, but a number of his friends persuaded him to permit the use of his name for another year.

From his inception into the drug business, Charles Bullock has always lived in an atmosphere permeated by the influence of the Philadelphia College of Pharmacy. For half a century was he connected with the institution, and served her faithfully both as a member and an officer. His interest and zeal in her success were unwavering and untiring was his work in her behalf. She claimed a larger share of his time than any other interest outside of his business. He was a member of the committee that selected the present site of the College, and has served on all her building committees since. For years he was chairman of the Property Committee and the Committee on Instruction, and Treasurer of the Publication Committee, and has been a member of nearly every important committee of the College or the Board of Trustees.

As a member of the Committee on Memoirs he has prepared many of the biographies of deceased members, and in these he has exhibited most excellent taste and a pleasing and appropriate literary style. The memoirs of Prof. Wm. Procter, Jr., *AMERICAN JOURNAL OF PHARMACY*, 1874, page 512, and Daniel B. Smith, *AMERICAN JOURNAL OF PHARMACY*, 1883, page 337, are models worthy of repeated perusal and study.

A brief retrospection will serve to show the value of his services to pharmacy. He enjoyed the confidence of the older members who were instrumental in establishing the College. He was the cotemporary of Parrish, Procter and Maisch, and, bound by ties of close friendship, these eminent pharmacists were frequently associated in the study, scientific labors and literary productions that have added such lustre to American pharmacy and renown and honor to this College. He always assumed his full share of the responsibilities and labor. His efforts, though made in his usual quiet and unobtrusive manner, were always directed toward maintaining the highest standing for the College and upholding the dignity and scientific standard of her publications.

It was his privilege, as President, to safely guide the good old ship on several of her most successful and progressive voyages. His contributions to pharmaceutical literature, exclusive of reports and memoirs, number more than twenty-five papers published in the AMERICAN JOURNAL OF PHARMACY. His painstaking investigations of the complex principles existing in *Veratrum viride* were especially valuable and received prominent notice in foreign scientific publications, and he was elected an honorary member of several European societies.

In recognition of his public services for the advancement of pharmacy, his *Alma Mater* conferred upon him the degree of Master in Pharmacy, *honoris causa*. He was thoroughly acquainted with the various processes adopted by pharmacists and chemists, and was himself a skilled manipulator. He prided himself upon his ability to spread plasters by hand, and considered this attainment one of the lost arts of pharmacy.

Although largely self-taught in analytical chemistry, yet by study and practice he became accurate in his results. He was well acquainted with the methods of detecting impurities and adulterations, and had at his command the methods of purifying and making pure chemicals. He had especially worked out a scheme for separating the metals of the platinum group and producing pure salts of these; likewise, the production of pure salts of manganese. He possessed considerable mechanical skill and ingenuity in metal work and had fitted up at his home a small machine shop, replete with lathe, turning tools and all necessary accessories, and until a very short time before his decease took great pleasure in this work.

In 1857 Charles Bullock joined the American Pharmaceutical Association. He was elected Recording Secretary of the Association in 1859 and served in this capacity for two years. At the meeting in Philadelphia, in 1876, he was elected President. For a number of years he attended the annual meetings, and was greatly interested in the proceedings.

He was a member of the American Philosophical Society, but does not appear to have been active in its work.

He was also a member of the Academy of Natural Sciences of Philadelphia, and for a while he took an active interest in its Microscopical Section. Here he enjoyed the society and friendship of Dr. J. G. Hunt and Joseph Zentmayer. These kindred spirits made the section meetings profitable and interesting. Here Mr. Bullock's manipulative dexterity was again exhibited as he became expert in mounting and preparing permanent slides for microscopic examination.

For many years he was a member of the local Civil Service Board, charged with the duty of examining candidates for positions as chemists and pharmacists coming under the control of the municipal departments.

Next to the Philadelphia College of Pharmacy, the Franklin Institute claimed the attention and time of Charles Bullock. The wide scope of the work of the Institute, embracing science, arts, mechanics and manufacture, appealed strongly to his nature and in this field his varied experience and great breadth of knowledge made him a valuable worker and prominent in the direction of its affairs. He rendered valuable service as curator, manager, Vice-President and President and at the time of his decease was First Vice-President and a member of the Board of Managers. For years he served on the Publication Committee of the Institute and many of its other important committees. In 1874, the Franklin Institute gave an exposition in the old freight station at Broad and Market Streets, which had been but shortly before vacated by the Pennsylvania Railroad, and which subsequently became the property of John Wanamaker and was rebuilt for his store. As a precursor of the Centennial, it did much to prepare the way for and popularize the great exposition of 1876. Charles Bullock did excellent service on the committee of the Institute having charge of the exhibition.

In 1884, the Franklin Institute gave the "Electrical Exhibition" designed to illustrate the great advance that had been made in the practical applications of electricity, and again we find Charles Bullock serving as Chairman of the Committee on Space and Installation of Exhibits, a position in which he exhibited great administrative and executive abilities.

At a special meeting of the Board of Managers of the Franklin Institute, held Friday, March 23, 1900, the following resolutions were unanimously adopted:

"*Resolved*, That the Board has heard with extreme regret of the death of Mr. Charles Bullock, one of the oldest members of the Institute; one whose great ability in his profession, capacity for administration and mature judgment have been of the greatest service; while his uniform kindness and courtesy have endeared him to his associates on the Board.

"*Resolved*, That a committee of three be appointed by the President to prepare a memorial of Mr. Bullock for publication in the *Journal*.

"*Resolved*, That as a further testimony of respect for his memory, the members of the Board will attend the funeral in a body, and that the Institute be closed during the hours of service."

Charles Bullock was a keen observer and possessed the ability of storing away his observations for future application. This characteristic of a mind trained by scientific study is thus described by Sir John Lubbock:

"It would be impossible to overrate the importance of scientific training on the wise conduct of life.

"Science, said the Royal Commission of 1861, quickens and cultivates directly the faculty of observation, which in very many persons lies almost dormant through life, the power of accurate and rapid generalization, and the mental habit of method and arrangement."

His extensive reading and experience gave him a fund of knowledge covering a wide range of subjects relating to the arts and manufactures. He was frequently consulted by manufacturers seeking assistance to overcome chemical problems or difficulties arising in their work. He always was ready to respond, and most valuable information and suggestions were given gratuitously. In the investigations of accidents, explosions, fires or other calamities the

public officials and insurance inspectors frequently sought his assistance.

This disposition to impart information and to encourage others to acquire knowledge was one of his marked characteristics. He was a successful experimenter and capable of giving instructive exhibitions. In connection with his brother, Dr. Wm. R. Bullock, he delivered a series of lectures in Wilmington and nearby towns upon electrical subjects. They procured from Ritchie a large induction coil, the largest one then in this section of the country, and their demonstrations therewith attracted considerable attention. They also, by means of a powerful Maymoth battery, showed the deflagration of iron and the electric arc between carbon points, which they were forced to make themselves, as at that time none were to be had. On several occasions he gave instructive lectures on technical matters and illustrated by experiments to the young people of St. Peter's Church, Germantown.

He was a friend of Samuel Jackson, the noted pyrotechnist, and associated with him in many experiments. Taking considerable interest in pyrotechny, during the period of the Civil War, when these displays were popular, he made several very creditable amateur exhibitions with products of his own manufacture.

Charles Bullock was married on February 23, 1854, to Miss Margaret C. Robinson, of Richmond, Va. Mrs. Bullock died July 17, 1870. But one son, Wm. A. Bullock, a graduate of the Philadelphia College, survives.

Originally a member of the Society of Friends, he retained much of the quiet demeanor and simplicity so characteristic of the members of that faith. His marriage appears to have decided his connection with the Episcopal church, and shortly thereafter we find him a vestryman in old Christ Church and the teacher of a bible class in the Sabbath School. Upon removing to Germantown he united with Christ Church, Germantown. Owing to a variance of opinion of the pastor from that held by certain of his parish, some feeling arose, and it was decided by the pastor and his friends withdrawing and organizing the new parish of St. Peter's Church, Germantown, in 1873. Mr. Bullock and Mr. Crenshaw were both members of the vestry at the organization and by the death of the former the last remaining member of the original vestry has been removed to the Church Triumphant.

In 1897, the history of St. Peter's Church, Germantown, in the city of Philadelphia, by Rev. Theodore S. Rumney, D.D., and Charles Bullock, was published. The style of this historical sketch indicates very largely the pen of Charles Bullock.

His kindly disposition, his cheering words of comfort and advice, the personal sacrifices, the unpublished charities, the faithfulness with which every duty was performed, and, above all, the silent eloquence of a life diligently spent in the service of the Master, symbolizè the thought, though unexpressed by him,

"Thy presence through my journey shine,
and crown my journey's end."

During the greater portion of his life Charles Bullock had enjoyed exceptionally good health. In recent years he had complained of neuralgia and rheumatism. The decease of his associate in business, Mr. Edmund A. Crenshaw, on February 19, 1894, after but a very brief illness, was a severe blow to him, from which he never recovered. His friends noticed the change and endeavored to induce him to take a much-needed rest, but as long as strength permitted he insisted upon daily visiting the store and attending to business.

Finally, with body weakened and strength consumed by years of activity, his will could no longer dominate exhausted nature, and he was compelled to take to his bed. His last illness extended over a period of five weeks, and while complicated with phlebitis and an attack of pneumonia, his decease was really due to physical exhaustion. He passed away from this life peacefully at his home, 1017 Clinton Street, Philadelphia, on March 21, 1900, and interment was made at Wilmington, Del., March 24th.

"Sure the last end
Of the good man is peace! How calm his exit!
Night dews fall not more gently to the ground,
Nor weary worn-out winds expire so soft.
Behold him in the even-tide of life—
A life well spent—whose early care it was
His riper years should not upbraid his green:
By unperceived degrees he wears away;
Yet, like the sun, seems larger at his setting."

G. M. B.

ATMOSPHERIC OZONE.

BY R. A. HATCHER, M.D., and H. V. ARNY, PH.D.

Having made some quantitative estimations of atmospheric ozone in the neighborhood of Covington, La., intended for use in an article upon that place as a health resort, the literature upon the subject proved such a surprise to the authors that a separate article was deemed timely.

Though the "electrical odor" which we attribute to ozone had long been known, and Van Marum had, in 1785, passed a current through oxygen, producing a substance, some of the characteristics of which he studied, to Schönbein is due the credit of stimulating research upon this difficult subject.

Dr. Andrews (*Phil. Trans.*, 1855-56, 1-3) showed that ozone was denser than oxygen, and, in the following year, Odling gave its molecular formula as O_3 .

Soret (*Ann. Chem.*, XIII, 257) confirmed this in 1865 by removing one-third of the oxygen from ozone with potassio-mercuric iodide, while he removed all the ozone from its admixture with air, by means of oil of turpentine.

Sir Benj. Brodie further confirmed Odling's formula by showing that three volumes of oxygen are condensed to two volumes of ozone, and that ozone has one and one-half times the density of oxygen.

Several methods have been suggested for the detection and estimation of ozone. Schönbein's paper is prepared by making a solution of potassium iodide in gelatinous starch paste, spreading this upon paper and drying, this being protected from light and air.

Houzeau (*Pogg. Ann.*, CIX, 180), whose testimony is corroborated by Gianneti and Volta (*Gaz. Chim. Ital.*, IV, 421), found Schönbein's paper unreliable, and recommended (*Ann. Chim. et Phys.*, XXVII, 5) red litmus paper treated with a neutral solution of potassium iodide, ozone liberating potassium hydrate and changing color of paper to blue. He also suggested (*Compt. Rend.*, XLIII, 38, and LII, 527) the use of a solution of potassium iodide for quantitative estimation, the ozone converting a part of the iodide into iodate, hydrochloric acid being added to liberate the iodine, which is estimated in the usual manner with sodium thiosulphate.

Hartley (Watt's Dict.) recommended potassium arsenite for

ozone assay; ozone oxidizing arsenite to arsenate, and the ozone factor is deduced by calculation of loss of arsenite.

The detection and quantitative estimation of ozone in the atmosphere are particularly difficult, because of its minute proportion and by reason of the numerous normal and abnormal constituents of the atmosphere, which interfere with the test. It is, therefore, not surprising that widely varying and even contradictory results are obtained by equally competent observers; not only as to conditions, time of day and season when greatest amount is present, but also as to meteorological changes and maximum amount. Its very source is still a problem, being variously attributed to action of sunlight, to evaporation of moisture (fresh and saline solutions), to electrical discharges (abundantly proven), to plant-life processes; indeed, one authority suggests the moist mucous membrane of the respiratory tract is capable of converting all the oxygen entering the blood into ozone!

The work done by the Michigan Board of Health to determine the presence of atmospheric ozone and its relation to disease or health has been very extensive and along lines which should lead to valuable results. Nicholson (Rep. Mich. Bd., 1880) has made numerous ingenious and interesting observations under conditions of hygienic interest. It is, however, much to be regretted that the unreliable Schönbein paper was used in all his work, thereby vitiating much of his data. For instance, he draws conclusions from the coloration of the paper when placed near charcoal pits and over swamps, despite the fact that Bastaudin has shown that iodine is liberated from potassium iodide by carbonic acid, while Papisogli reports that similar decomposition is accomplished by carbon dioxide (Nat'l Disp., p. 1302). These reactions easily explain the coloration of Schönbein's paper cited above.

In the same manner, Dr. Prestel (Brochure, Dresden, 1865) took daily observations at Emden, from 1857 to 1864, with special reference to influence of winds and of time (day, night or season).

Dr. Ambrook (Rep. Col. Bd. Health, 1877) made similar observations, but with totally different results. To quote his words, "a careful research of the literature at my command has impressed me with the belief that the 'Ghost that Schönbein raised' will not be so easily laid, for a more contradictory set of results, from apparently equally competent observers, is hard to find than is the record about ozone."

When it comes to actual quantitative work, the statistics are even more bewildering. Most careful examination of the literature brought to light but three writers who commit themselves to figures, and in each case the data is strikingly dissimilar.

Houzeau (*Ann. Chim. Phys.*, XXVII, 5) states that the maximum of ozone in the atmosphere is 1 part to 450,000 by weight (or 0.28 milligramme to 100 litres air). Schöne (Brochure, Moscow, 1897) gives amount as varying from 1 to 10 milligrammes to 100 litres air; while H. de Varigny (Smithson. Miscell. Coll., XXXIX, 27) says that the average is 1 milligramme and the maximum is $3\frac{1}{2}$ milligrammes to 100 cubic metres air. The latter statement, which means 1 to $3\frac{1}{2}$ milligrammes to 100,000 litres, is at such variance with the other figures that we can only consider it as a typographical error.

These references seem to confirm us in the belief that we are among the pioneers in the field of atmospheric ozone assay, and, while conscious of the liability to err, our results are given in the hope of leading to further observations not open to the objections to which Schönbein's paper is subject. Most strongly is it hoped that the national government may take up this important work, as it is an undertaking almost beyond the scope of a single observer.

Two methods of ozone assay were employed: Hartley's, in which the arsenite is oxidized to arsenate by the following reaction: $\text{KAsO}_2 + \text{O}_3 = \text{KAsO}_3 + \text{O}_2$; second, Houzeau's, in which potassium iodide is oxidized to iodate, by the following method: $\text{KI} + 3\text{O}_3 = \text{KIO}_3 + 3\text{O}_2$.

The solution of potassium arsenite (corresponding to 3 grammes arsenite to 1 litre) was prepared by heating in water 1.966 grammes arsenious acid and 1.465 grammes potassium carbonate, bringing finished solution up to 1,000 c.c. Of this, portions of 20 c.c. were placed in glass stoppered bottles for the ozone test, enough space being left in each bottle for the addition of wash liquid.

The solution of potassium iodide was made by dissolving 100 grammes of the iodide in enough water to make 1,000 c.c., and portions of 20 c.c. were placed in bottles, as in the case of the arsenite.

These bottled solutions were sent to Covington, La., and the passage of air through each was performed around a hotel situated on the bank of a small stream, about a mile from the village. A significant difference, however, lay in the fact that, in February, the

apparatus was placed on the veranda, while in March it was located in the yard, at least 50 feet from the house. This difference, though small, had an undoubted influence on the circulation of air and is important in explaining the smaller amounts of ozone found in February. In Covington, as elsewhere, March is the most windy month of the year. In February the air was comparatively still, but our notes show that on the 27th—date of maximum ozone of the month—it was quite windy.

The absorption of a definite amount of air was accomplished by siphoning a definite quantity of water from an air-tight container, fitted with a rubber cork, through which passed two glass tubes, one serving as the siphon, the other to admit air. To the inlet tube was attached an appropriate potash bulb—Mohr's or Liebig's—preference being given the former.

As containers, a 26-gallon oak barrel and a 10-gallon tin can were employed, the latter proving more satisfactory, because more convenient to handle and less prone to leakage. The measurement of the siphoned water (of course the volume of air admitted was identical to that of the water removed) was accomplished in two ways: (1) By measuring the amount actually siphoned off; (2) by placing a definite quantity of water in the container and then measuring the quantity left after the siphon ceased to run. Both methods gave practically identical results, and, as the latter was more convenient, it was usually employed.

Each solution was directly transferred from its bottle to the absorption bulb by suction, the traces of the solution clinging to the outer lip of the bulb being carefully washed back into the bottle with distilled water. The bulb was immediately attached to the siphoning apparatus by a rubber joint, the flow of air regulated to 100-150 bubbles a minute and continued until the desired amount had passed through the solution.

As the value of both methods of assay—the iodide and the arsenite—has been assailed on the ground that similar oxidizing effect might result from the acid constituents of the atmosphere, it was deemed expedient in some of the tests to first pass the air through a solution of soda. Such tests are marked with an asterisk in the appended tables, and it will be noticed that our figures show that the criticism is groundless.

After the air had passed through the solution, the contents of the

bulb were returned to the original bottle, it being necessary to employ a porcelain capsule for this purpose. The bulb and capsule were repeatedly washed with distilled water, the washings added to the solution in the bottle and the filled and securely stoppered bottles returned to Cleveland, for titration. Of each separate batch of solutions handled, one bottle each, of the iodide and of the arsenite, was returned to Cleveland as it had been sent—unopened. These solutions, as well as the original solution remaining in Cleveland, were used as control, the solutions in the unopened bottles having undergone all the vicissitudes of their fellows, save the actual absorption of air.

To each of the potassium arsenite solutions was added 2 c.c. of a 10 per cent. solution of ammonium carbonate and 2 c.c. of a 1 per cent. starch paste. Then it was titrated with $\frac{1}{40}$ normal iodine V. S. It was noted that the color first appearing faded after about fifteen minutes, and a few extra drops were added to give a lasting color.

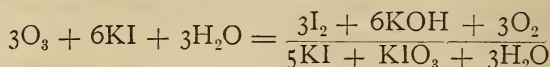
The following explains the calculation of the amount of ozone:

KAsO_2 ; molecular weight, 145.85. O_3 ; molecular weight, 47.88.

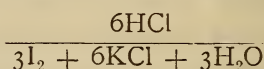
Since one molecule of ozone is required to convert one molecule potassium arsenite to arsenate, 145.85 grammes KAsO_2 equals 47.88 grammes ozone, or 1 gramme arsenite equals 0.3287 gramme ozone.

The U.S.P. says that 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0.004942 gramme As_2O_3 , and since $2\text{KOH} + \text{As}_2\text{O}_3 = 2\text{KAsO}_2 + \text{H}_2\text{O}$, we deduce that 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0.007292 gramme KAsO_2 ; the molecular weight of 2KAsO_2 (291.7) being to that of As_2O_3 (197.68) as 0.007292 is to 0.004942. Since 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0.007292 gramme KAsO_2 , and since 1 gramme KAsO_2 equals 0.3287 gramme ozone, it follows that 1 c.c. $\frac{1}{10}$ normal iodine V. S. indicates 0.0023968804 gramme ozone, and the difference between the amounts of iodine V. S. required in titrating the original solution and that acted upon by the atmospheric ozone indicates the amount of ozone acting upon the KAsO_2 ; hence, in the table given below only the difference in cubic centimetres is given, it being understood to represent, in each case, a diminution of arsenite and increase of arsenate. As $\frac{1}{40}$ normal iodine V. S. was employed, each cubic centimetre in the table indicates but $\frac{1}{4}$ of 0.0023968804, or 0.00059922 gramme ozone.

The potassium iodide solutions were treated with a very dilute hydrochloric acid (2 c.c.) and starch paste (2 c.c.), and then were titrated with $\frac{1}{100}$ normal sodium hyposulphite V. S., according to pharmacopœial directions. This method is based on the following reactions, given by Schwanert (*Pharm. Chem.*, I, 292):



Add to this,



Hence, 3I_2 equals 3O_3 , or I_2 equals O_3 , or 253.06 grammes iodine equals 47.88 grammes ozone, or 1 gramme iodine equals 0.1889-0.1890 gramme ozone.

One cubic centimetre $\frac{1}{100}$ normal hyposulphite V. S. equals 0.0012653 gramme iodine.

One gramme iodine equals 0.1889 gramme ozone; hence, 1 c.c. $\frac{1}{100}$ normal hyposulphite V. S. equals 0.000239 gramme ozone.

As in the case of the arsenite, the figures given in the following table are for the difference only, and the results are expressed in milligrammes. The accuracy of this iodide assay has been questioned, but the close similarity of its results to those from the arsenite assay leads us to believe that both methods are reliable.

The results of the fifteen assays are tabulated below:

TABLE NO. I.
 TABLE OF ESTIMATIONS WITH SOLUTION OF POTASSIUM ARSENITE.

Solution No.	Date.	Litres of Air Passed.	Hours in Passing.	Difference in Cubic Centimetres of $\frac{n}{40}$ I. V. S.	Ozone (Milli-grammes) Indicated.	Ozone (Milli-grammes) per 100 Litres of Air.
I.	February 21	37.640	7'	.40	.24	.63
II.	" 24	68.210	9.25	.65	.39	.57
III.	" 26	78.672	10.5	.20	.12	.15
IV.	" 27	37.400	8'	.70	.42	1.12
*V.	{ " 28 to March 1 }	97.752	16.75	.70	.42	.43
*VI.	" 20	77.876	9'	.40	.24	.30
*VII.	" 21	77.651	9'	4.30	2.57	3.30
*VIII.	" 22-23	73.246	15.5	4.20	2.52	3.45
*IX.	" 26-29	349.637	70'	.50	.30	0.085

TABLE No. II.

TABLE OF ESTIMATIONS WITH SOLUTION OF POTASSIUM IODIDE.

Solution No.	Date.	Litres of Air Passed.	Hours in Passing.	$\frac{n}{100}$ V. S. Sod. Hypo. in Cubic Centimetres.	Ozone (Milli-grammes) Indicated.	Ozone (Milli-grammes) per 100 Litres of Air.
I	February 22	67'824	8'5	'15	'035	'050
II	" 23	75'832	10'	'05	'012	'015
*III	March 16	37'026	8'	24'5	5'85	15'810
*IV	" 17	75'414	10'	20'2	4'83	6'40
*V	" 19	77'612	9'	11'2	2'67	3'45
*VI	" 23-25	194'564	57'	25'7	6'14	3'16

In conclusion, we wish to say that the assays are deemed of as much value qualitatively as quantitatively, the mere presence of ozone, with a reasonable degree of constancy, indicating an atmosphere free from miasmatic emanations or other impurities deleterious to life. At the same time it may be that ozone, coupled with a mild and balmy climate, has some directly antizymotic influence; in fact, the Michigan Board of Health reports seem to indicate conclusively that ozone and zymotic diseases exist in directly inverse ratio.

Lastly, our assays were made without special reference to meteorological conditions, and it is to be hoped that further investigations, with these conditions in view, will soon be made. Such work the authors hope to undertake in the near future.

CLEVELAND, O., July, 1900.

SOME OF THE UNPUBLISHED RESULTS OF THE INVESTIGATION OF THE TANNINS BY THE LATE PROFESSOR HENRY TRIMBLE.

COMPILED FOR PUBLICATION BY JOSIAH C. PEACOCK.

(Continued from page 342.)

CUPULIFERÆ.

Castanea Pumila.—A sample of this tree secured from a nursery near Philadelphia, in March, 1896, showed the following results:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	7'57	5'91	17'18
Stem bark	7'03	4'79	6'36

The ashes were composed of potassium, calcium, and iron as carbonates, sulphates and phosphates.

Fagus Ferruginea.—A sample of bark from the common beech, *Fagus ferruginea*, collected at Haddonfield, N. J., on June 27, 1893, yielded the following results: Moisture, 29.33 per cent.; and tannin in the absolutely dry bark, 2.44 per cent. The properties of the tannin found in this bark, as displayed by qualitative reactions, indicate its similarity to the members of the oak bark group of tannins.

Carpinus Americana.—A sample of bark from *Carpinus americana* was collected at St. David's, Pa., on June 27, 1894. It showed the following quantities: Moisture, 10.14 per cent.; ash in absolutely dry bark, 10.43 per cent.; tannin in absolutely dry bark, 3.67 per cent.

Alnus Serrulata and Alnus Rubra. Barks from two species of *Alnus* were examined. The bark of *Alnus serrulata* was collected at St. David's, Pa., on July 13, 1895. The bark of *Alnus rubra* was received from Prof. F. E. Lloyd, Forest Grove, Ore.; it was gathered on October 5, 1895. The results were as follows:

Species.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
<i>A. serrulata</i>	15.88	6.49	6.05
<i>A. rubra</i>	7.66	5.31	9.84

It is reported that the bark of *Alnus rubra* is used for tanning in the vicinity of Forest Grove, that the color of the leather produced with it is light, and the quality apparently as good as that tanned with hemlock or spruce bark.

Quercus.—In order to determine the value of the inner and outer bark of the chestnut oak, *Quercus prinus*, a lot of bark was collected from the trunk of a medium-sized tree, near the ground. The trunk was about 8 inches in diameter. The bark was carefully separated into the two layers. The respective portions showed the following figures:

	Inner Bark.	Outer Bark.	Entire Bark.
Moisture	14.83	14.14	15.05
Ash in absolutely dry bark	1.63	1.41	1.65
Tannin in absolutely dry bark	11.12	7.16	10.59

Specimens of the bark of *Quercus arizonica* and *Q. oblongifolia* were furnished by Professor Toumey, of Tucson, Ariz. Professor

Lloyd, of Forest Grove, Ore., sent a sample of the bark of *Q. garryana*. A sample of the bark of *Q. macrocarpa* was collected near Springfield, O., by W. E. Ridenour, and a sample of the bark of *Q. virens* was obtained through Dr. Mohr, of Alabama. The following results were obtained :

Species.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
<i>Q. arizonica</i>	7.77	20.65	5.88
<i>Q. oblongifolia</i>	8.97	19.17	8.39
<i>Q. macrocarpa</i>	10.19	8.53	13.65
<i>Q. garryana</i>	4.91	11.65	6.16
<i>Q. virens</i>	9.96	6.58	3.55

The tannins of all of the barks gave qualitative reactions like those of the members of the oak bark group already reported by Professor Trimble. The tannin of *Quercus garryana* showed 59.66 per cent. of carbon, and 5.55 per cent. of hydrogen, establishing its relationship to the members of the oak bark group of tannins. The ash of *Q. garryana* consisted almost exclusively of calcium phosphate.

Acorns of Quercus Reticulata.—A sample of the acorns of this species of oak was supplied by Professor Toumey, of the Agricultural Experiment Station at Tucson, Ariz. The pericarp was removed from the kernel, and each part estimated separately with the following results :

	Pericarp.	Kernels.
Moisture	5.81	6.80
Ash in absolutely dry	2.60	4.04
Tannin in absolutely dry	3.08	4.20

The ash of both parts contained aluminum, calcium, magnesium, potassium, iron and manganese, combined with phosphoric, hydrochloric and sulphuric acids; that of the pericarp contained silicic acid in addition to the foregoing.

EUPHORBIACEÆ.

Jatropha Cardiophylla.—A supply of the roots and stems of *Jatropha cardiophylla*, Muell., was received from Prof. J. W. Toumey on March 4, 1896. This gentleman also sent the following description: "An abundant shrub on the dry foothills of southern Arizona and Sonoræ. You will observe the beautiful rich color of the root and stems. This color I am told is imparted to the leather in tanning. This plant is probably the most abundantly used by the Indians and Mexicans for the purpose of tanning of any of our native plants. It has the reputation of producing an exceedingly fine leather of superior quality. The plant is known to the Mexicans as 'Sangre de Drago.'" An estimation of the material showed the following percentages:

	Per Cent.
Moisture	7.12
Ash in absolutely dry	4.95
Tannin in absolutely dry	5.27

Rhizophoræ.—The following mangrove barks were received from Dr. H. N. Ridley, of the Botanic Gardens at Singapore, who wrote as follows: "The mangrove barks I sent all grow in the mangrove swamps, and all but Carapa belong to the *Rhizophoræ*. Carapa is a *Meliaceæ*. The mangrove swamps consist of tidal mud, covered with a thick growth of the trees which I sent the bark of; to which may be added *Aircennia* and the *Sonneratias* and *Heritiera*. There is little else there excepting epiphytes on the mangrove trees. Nearly all these trees contain, or may be expected to contain, tannin, which no doubt protects them from injury by the sea water. But the only ones used for tanning are those I sent you. Indeed, Carapa is not used in this way, but as an astringent for dysentery. *Ceriops* is considered far the most valuable for tanning, and in addition is used for dyeing cloth."

The barks have the following names, and are from the respective sources:

- Akit, *Rhizophora conjugata*.
- Tumu, *Bruguiera rheedii*.
- Lenggadi, *Bruguiera parviflora*.
- Supsup, *Sumnitzeria coccinea*.
- Belukop, *Rhizophora mucronata*.
- Tengah, *Ceriops candolleana*.
- Bosing, *Bruguiera caryophylloides*.
- Nirch, *Carapa mollucana*.

The estimation of these barks showed the following figures :

Name.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Rhizophora conjugata . . .	6·71	9·58	17·90
Bruguiera caryophylloides .	6·59	9·55	8·96
Rhizophora mucronata . . .	7·00	8·80	19·57
Bruguiera parviflora	7·68	7·37	7·98
Bruguiera rheedii	8·11	7·24	19·37
Sumnitzeria coccinea	9·01	7·53	11·75
Carapa mollucana	9·29	10·23	27·56
Ceriops candolleana	7·22	10·21	24·19

ROSACEÆ.

Potentilla Norwegica and *Potentilla Canadensis*.—The material for the work upon *Potentilla norwegica* was collected near St. David's, Pa., on August 26, 1896. The several parts were separated as indicated in the following tabulation of results:

	Root.	Stem.	Leaves and Flower-heads.
Moisture	9·55	10·75	17·20
Ash in absolutely dry material	6·30	4·31	9·96
Tannin in absolutely dry material	2·22	0·45	4·13

The ashes of the several parts consisted of magnesium, calcium, potassium and iron combined with carbonic, sulphuric, hydrochloric and phosphoric acids.

On May 24, 1894, some leaves were collected from *Potentilla canadensis*, at St. David's, Pa. These upon estimation showed:

	Per Cent.
Moisture	72·13
Ash in absolutely dry material	9·90
Tannin in absolutely dry material	13·34

BRAIN MATTER IN MILK.—Henry Leffmann records the adulteration of calves' and sheep's brains in milk, and considers the adulteration a dangerous one because of the liability of the brain to contain virulent microbes and the localization there of certain stages of dangerous entozoa.—*Jour. Amer. Chem. Soc.*, 1900, p. 356.

RECENT LITERATURE RELATING TO PHARMACY.

THE TESTING OF ACETONE.

Crude acetone may contain a number of undesirable ketones which occasionally find their way into the purified article, and our present analytical methods are generally deficient for making proper deductions. Most of the methods not only estimate the acetone, but also include other homologous ketones and associated bodies.

A good acetone should mix clear with distilled water and when evaporated at 100° C. should not leave any residue. Its specific gravity should not exceed 0.800 at 15.5° C. and four-fifths of the quantity taken, by volume, must distil at a temperature not exceeding 59° C. The acetone should not contain more than 0.005 per cent. of acid, calculated as acetic acid, which is estimated by diluting 50 c.c. of the acetone with an equal volume of distilled water, adding 2 c.c. of phenolphthalein solution, and titrating with N/100 sodium hydrate. On adding 1 c.c. of a $\frac{1}{10}$ per cent. solution of potassium permanganate to 100 c.c. of the acetone, a distinctive color must be retained for at least thirty minutes.—Mr. James T. Conroy, *J. Soc. Chem. Ind.*, 1899, 19, 206. L. F. KEBLER.

THE IODINE VALUE OF OILS.

Literature is teeming with results on the iodine value of oils, yet the exact nature of the reactions of the various methods proposed is obscure. Wijs' proposition (*Ber. deut. chem. Gesel.*, 1898, 31, 750) to employ a solution of iodine monochloride in acetic acid in place of Hübl's solution marks a distinct advance in the practical execution of such determinations. Wijs' solution is rapid in reaction, nearly permanent, and Lewkowitzsch has shown (*Analyst*, 1899, 257) that it gives the same iodine values as Hübl's solution.

Ephraim (*Ztsch. angew. Chem.*, 1895, 254) thought and even Wijs himself (*Ztsch. anal. Chem.*, 1898, 277) was of the opinion that with Hübl's solution the iodine monochloride was added directly to the unsaturated acid radical. Wijs now thinks that the iodine chloride reacts with water as follows: $\text{ICl} + \text{H}_2\text{O} = \text{HIO} + \text{HCl}$; the hypoiodous acid formed is then added to the unsaturated radical; $\text{C}_{17}\text{H}_{33}\text{CO}_2\text{H} + \text{HIO} = \text{HIOC}_{17}\text{H}_{33}\text{CO}_2\text{H}$, which addition product subsequently reacts with the hydrochloric acid,

formed in the first equation, thus completing the reaction, $\text{HIOCl}_{17}\text{H}_{33}\text{CO}_2\text{H} + \text{HCl} = \text{ClIC}_{17}\text{H}_{33}\text{CO}_2\text{H} + \text{H}_2\text{O}$.

Mr. Arthur Marshall, the author of this paper, differs with Wijs as to the above theoretical reactions, claiming that the same results can be secured without the intervention of water. He proves this by making a solution of iodine monochloride in dry carbon tetrachloride, applying it, and on comparing the results obtained by this solution, with those obtained by Hübl's and Wijs' solutions, finds that almost identical results are obtained.—1899, *J. Soc. Chem. Ind.*, 19, 213. L. F. K.

PHILADELPHIA HOSPITAL FORMULARY.

(Continued from page 356.)

PULVERES.

Pulveres Acetanilidi Compositi.

Each powder contains :

Powd. Acetanilide,

Sodium Bicarbonate, of each 2'5 gr. 0'15 gm.

Dose : One or two powders.

Pulveres Caffeinæ Compositi.

Each powder contains :

Caffeine (Alk.) 1'5 gr. 0'1 gm.

P. Acetanilide 2'5 gr. 0'15 gm.

Sodium Salicylate 5 gr. 0'3 gm.

Dose : One or two powders.

Pulveres Bismuthi.

Each powder contains :

Bismuth Subnitrate,

5 gr. 10 gr. 15 gr. 30 gr.

= 0'3 gm. 0'6 gm. 1 gm. 2 gm.

Dose : One powder.

Pulveres Bismuthi et Bismuthi.

Each powder contains :

Bismuth Subgallate 5 gr. 0'3 gm.

Bismuth Subnitrate 15 gr. 1 gm.

Dose : One or two powders.

Pulveres Bismuthi Cum Kino.

Each powder contains :

Powd. Kino 10 gr. 0'6 gm.

Powd. Cinnamon 10 gr. 0'6 gm.

Bismuth Subnitrate 10 gr. 0'6 gm.

Bismuth Subgallate 5 gr. 0'3 gm.

Dose : One powder every 2 or 3 hours.

Pulveres Bismuthi Cum Soda.

Each powder contains :

Bismuth Subnitrate	10 gr.	0'6 gm.
Sodium Bicarb.	10 gr.	0'6 gm.

Dose : One or two powders.

Pulveres Mercuriosi Compositi.

Each powder contains :

Mercurous Chloride, Mild	$\frac{1}{2}$ gr.	0'005 gm.
Powd. Ipecac	$\frac{1}{2}$ gr.	0'005 gm.
Powd. Black Pepper	$\frac{1}{2}$ gr.	0'032 gm.
Sodium Bicarb.	2 gr.	0'13 gm.

Dose : One powder every two hours until six are taken, followed by a saline purgative.

J. W. E.

Pulveres Morphine Sulphatis.

Each powder contains :

Morphine Sulphate	$\frac{1}{8}$ gr.	$\frac{1}{4}$ gr.
	= 0'008 gm.	0'016 gm.

Dose : One powder.

Pulveres Pancreatini Cum Soda.

Each powder contains :

Pancreatin	5 gr.	0'3 gm.
Sodium Bicarb.	10 gr.	0'6 gm.

SUPPOSITORIA.

Suppositoria Acidi Tannici.

Each suppository contains :

Acid Tannic	5 gr.	0'3 gm.
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Dose : One suppository.

Suppositoria Iodoformi.

Each suppository contains :

Iodoform	5 gr.	2 gr.
	= 0'3 gm.	0'6 gm.

Dose : One suppository.

P. H.

Suppositoria Opii.

Each suppository contains :

Powdered Opium	$\frac{1}{2}$ gr.	1 gr.	2 gr.
	= 0'032 gm.	0'065 gm.	0'13 gm.

Dose : One suppository.

Suppositoria Opii et Belladonnæ.

Each suppository contains :

Powd. Opium	1 gr.	0'065 gm.
Ext. Belladonna	$\frac{1}{4}$ gr.	0'016 gm.

Dose : One suppository.

Suppositoria Opii et Plumbi.

Each suppository contains :

Powd. Opium	1 gr.	0·065 gm.
Lead Acetate	3 gr.	0·2 gm.

Dose : One suppository.

Suppositoria Quininæ.

Each suppository contains :

Quinine Sulphate	5 gr.	10 gr.
	= 0·3 gm.	0·6 gm.

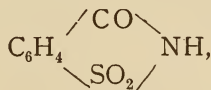
Dose : One suppository.

CHEMISTRY AND TASTE.

An interesting problem is suggested by Dr. W. Sternberg (*Verh. Physiol. Ges*, through *Ap. Zt.*, 1899, 184) in his endeavor to show connection between the relative taste of a substance and its chemical formula. His theory is that substances are sweet when they consist of atomic groups bearing to taste the same relation as a harmonic chord does to hearing. Such influencing groups he calls "sapiphores," and when these sapiphores are mated discordantly, a bitter product results. As sapiphores, the writer mentions the hydroxyl, the amino and the nitro groups, and, as types of harmony of taste, he suggests the following unions :

The negative hydroxyl, with a positive alkyl group ; thus, glycerin (C_3H_5OH) is sweet.

The positive amino with the strongly negative carboxyl ; thus, saccharin,



is sweet.

As discords, he cites the following :

Negative hydroxyl with negative phenyl. This is seen in bitter glucosides, which are combinations of glucose hydroxyls with phenyl compounds.

The positive amino groups with other positive groups, as shown in the alkaloids.

The most important point in the writer's theory is that all sweet substances have a double nature—consist of neutral combinations of positive and negative groups or atoms. The writer claims his theory applies to inorganic as well as organic bodies, and further developments will be awaited with interest.

H. V. ARNY.

EDITORIAL.

THE NEEDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

It has been said of Daniele Manin that he was made a delegate to a convention in Italy, where the subject of the improvement of that country was to be considered, and in particular the subject of the introduction of railroads. Manin protested that he should not be appointed a delegate, as he knew nothing about railroads; but finally he accepted the honor and attended the convention to please his friends. In the discussions which followed he was called upon for an opinion and said: "Gentlemen, I know nothing about railroads, but I do know something about the needs of Italy. What Italy needs is not railroads, but liberty."

It seems to us that in institutions and associations, as well as in nations, the greatest evils arise from the fact that the members do not recognize or attend to the fundamental needs of those whom they would benefit.

In a previous editorial (this JOURNAL, 1900, p. 356) the peculiar province of the American Pharmaceutical Association was considered, and it was suggested that it might be well to distribute copies of Article I of the constitution of the Association among the retail pharmacists of the United States. Since it was considered desirable or necessary to appoint a committee to consider measures for bettering the welfare of the Association, it is all the more evident that a discussion of this subject will be welcomed, no doubt, by the members of this committee as well as by members of this Association. In considering this matter, it has occurred to us that what this Association needs to increase its membership from *retail pharmacists* is a concentration of its energies particularly in two or three directions:

(1) The development of the new section on Pharmacy and Dispensing; (2) the concentration of considerable energy in its Commercial Section; and (3) looking after the Legislation in Pharmacy.

If, in the first instance, the problems relating to the general practice of pharmacy were discussed; and, in the second, the methods of increasing general, and particularly the prescription, trade were considered, and finally, in the third, matters pertaining to the laws relating to poisons, pure foods, etc., were to be debated and a consensus of opinion developed, we cannot but believe that the Associ-

ation would be considering some of the vital principles connected with its life. Fortunately, too, there are men ready and able to do this work, and it would pay the Association to consider the outlay of a little money, if necessary, to concentrate its energies along these lines.

While the N.A.R.D. promises much as a trade organization, it cannot do that work which will result in the ultimate good to pharmacy that should and must emanate from an organization like the A.Ph.A. The N.A.R.D. is working rather for temporary relief. The regulation of prices on proprietary and other popular preparations is of some moment, it is true, but the time is not far distant when proprietary medicines will play a very subsidiary part in the equipment and revenue of the pharmacist. There are far more important questions which lie at the heart and core of pharmacy than those considered by the N.A.R.D. at present. It is opportune indeed that the Association now put the proper men in harness and keep them there (and pay them if necessary) to ascertain and understand the needs of the apothecary at this time. It is a matter of education and not trade only. It is rather an adjustment to conditions and not the consideration of prices merely. In short, what is needed is liberty, first, to secure the proper and necessary education as an apprentice, and second, freedom to exhibit the strength of character that becomes the professional man. It is not only the regulation of charges that is needed. This will expedite business, but the profession must be there or there can be no solution to these momentous questions. Let the members of the Association not be deceived as to questions of economy and let them remember that the retail pharmacist cannot be inspired by an exhibition merely of some one else's products and inventions. What he needs is to be shown at college and at associations some of the *real* difficulties in pharmacy and how they can be overcome. He must be organized and led in the path of confidence by men of character—the strong leaders of this great Association.

PILOCARPUS RACEMOSUS of the French Antilles is given by Rocher as a new source of jaborandi. The leaves contain 0.6 per cent. of pilocarpine and 0.4 per cent. of jaborine. According to H. A. D. Jowett, the following alkaloids are present in jaborandi: pilocarpine, iso-pilocarpine (pilocarpidine of Petit and Polonowski), pilocarpidine (Harnack and Merck).

THE BRITISH PHARMACEUTICAL CONFERENCE.

The thirty-seventh annual meeting of the British Pharmaceutical Conference was held during the week of July 24, 1900. The meeting was held in London, and this is the second time in the history of the Conference that the meeting was held in this, one of the great cities of the world. The President of the Conference gave a very practical address, and one that is deserving the consideration of pharmacists of not only Great Britain, but of the United States as well. The account of the Conference which we give the readers of this JOURNAL has been taken from the *Pharmaceutical Journal*, July 28, 1900, which contains the President's address, and most of the papers in full.

PRESIDENTIAL ADDRESS.

By E. M. Holmes.

After dwelling briefly upon the progress of pharmacy during the century, Mr. Holmes says, regarding the subject of *counter prescribing*:

"It has been stated by medical men that what is known as counter prescribing by pharmacists is one of the causes why dispensing is not entirely handed over to the latter by the medical profession. The subject is no doubt surrounded with practical difficulties, but probably these are not insuperable. There is no law to prevent a man, however ignorant he may be, from prescribing remedies for himself, his friends, or his household, and it has been stated on high medical authority that it would not be objectionable for persons to apply at a pharmacy 'for simple remedies for toothache, muscular pain, or trifling dyspeptic ailments, provided the person seeking relief knew what he was about, and was not deceived by the assumption of an authority, or of titles, on the part of the chemist, and provided that such relief was merely to be regarded as first aid, or a temporary expedient for a definite complaint stated by the patient. But this is a very different state of things from what is known as a prescribing business, in which the chemist goes beyond his province in diagnosing disease and supplying remedies for it. In such business the straightforward plan would be for the proprietor to qualify as a medical practitioner, or to arrange with a properly qualified man to see his clients. The

converse of this is the medical practitioner who keeps open shop like a chemist, and to whom is largely due the difficulty that the uneducated public find in distinguishing between a chemist's and a doctor's shop. It might be possible, perhaps, for representatives of the medical profession and the Pharmaceutical Society to arrange a Conference to make mutual provisions for counter prescribing by chemists to cease on the one hand, and the keeping open shop by doctors on the other. This would need disciplinary powers for both bodies to deal with offenders, but the two bodies united could probably, by a good organization, bring sufficient influence to bear upon the Government to pass an Act authorizing such powers."

In considering the subject of *portable medicines* the President said:

"The increase in the rapidity of travelling and the absence of an international Pharmacopœia have caused a demand for portable medicines, which has been increased by the opening up of new countries where it is impossible to obtain medicine, so that a new industry in this direction has been developed, in which English pharmacists, with characteristic conservatism, have allowed Americans to take the lead. The great advantage in the saving of time by the use of portable medicines to both the medical practitioner and the patient—in country districts where there is no chemist within several miles, and where the considerable delay in the delivery of medicine, by reason of the distance, is often of serious importance—is almost certain to lead to the permanent adoption of such time- and labor-saving devices. The value to the public of portable medicines for travelling purposes cannot be denied, as well as to the Government, since in military and naval operations the sudden demands made upon medical stores and appliances necessitate the use of drugs and preparations occupying as little space as possible, in a form as concentrated as is compatible with safety, and not readily affected by the vicissitudes of climate. This form of medicine has, therefore, become a feature of the pharmacy of to-day, and is likely to develop still further. It has, however, the disadvantage of placing in the hands of the laity powerful remedies which they are apt to use without proper medical advice, and without the ability to judge of the nature of the disease for which they employ them."

The *limitations of the Pharmacopœia* were summed up in the following words:

“The vast number of new vegetable, chemical and animal remedies introduced during recent years, and the impossibility of keeping pace with them, on the part of the medical men and the pharmacist, especially in the provinces, where, as a rule, new remedies do not come into use until two or three years after introduction into city practice, has led to the comparative disuse of the Pharmacopœia for prescribing purposes, and to more dependence being placed by physicians, concerning new remedies, upon such works as Martindale’s ‘Extra Pharmacopœia’ and Squire’s ‘Companion to the British Pharmacopœia,’ works which enterprising pharmacists have produced to meet the necessities of medicine and pharmacy during the time that elapses between the publication of one Pharmacopœia and another. These works have also the additional advantage that they contain tables of diseases, and of all the most modern remedies used for them, as well as the doses and formulæ showing useful combinations of the various preparations. In these rapidly progressive times the Pharmacopœia cannot, even if published decennially, be actually up to date; it can only crystallize into a definite shape formulæ that have already been in use for some time. The Pharmacopœia is now really more used by pharmacists as a standard for insuring uniformity in official preparations than by physicians for prescribing purposes.”

In regard to the Pharmacopœia being looked upon as a *legal standard*, Mr. Holmes says it is not to be used as a legal standard of purity for drugs used in commerce for domestic and technical purposes.

“To prosecute chemists,” says he, “because, for instance, tincture of myrrh, which is used as a dentifrice rather than as a medicine, or benzoin, which is used in French polish, etc., or soft soap, or ammonium carbonate, soda water, or other articles in regular household use do not answer to the tests of purity of the B.P., would constitute an interference with trade that would be as absurd as it would be vexatious. That the standard of purity used in dispensing physicians’ prescriptions should be as high as it is possible to make it, is an article of faith of the B.P.C., but there are many cases in which drugs and preparations which are B.P. articles are used for other than medical purposes, and for such the average of normal condition of purity meets all the requirements of the case.”

Concerning an *International Pharmacopœia*, Mr. Holmes says

there is no reason why an approach to making a practical and useful work should not be made, and that a gradual growth is necessary for the perfection of the book.

The subject of *commercial education* was referred to in a rather forceful and beneficial way. Recognizing that it is next to impossible for the pharmacist to divorce his business from his profession, the President says :

“What they most need is a commercial education, instructing them in business methods and modern requirements. This has not hitherto formed part of a pharmacist’s education, and therefore the importance of the course of commercial education which has been started in some of our universities, and already forms an optional subject in the Philadelphia College of Pharmacy, cannot be over-estimated—at all events for those chemists and druggists who have to depend chiefly upon the sale of miscellaneous chemical and other articles rather than on dispensing. The conditions which have hitherto obtained in the retail trade of chemists and druggists have not during the last fifty years been favorable for acquiring a useful knowledge of business methods.”

THE CHEMISTRY OF THE BRITISH PHARMACOPŒIA.

By Frederick B. Power.

The author has, on experimental work, brought together a number of observations on the chemistry of the B.P., and has brought forth a number of suggestions which are none other than of a constructive character for this and other Pharmacopœias. The chemicals considered are: Acetanilide, glacial acetic acid, arsenious acid, benzoic acid, boric acid, citric acid, gallic acid, hydrobromic acid, phosphoric acid, salicylic acid, sulphuric acid, tannic acid, aconitine, amyl nitrite, atropine, bismuth carbonate, bismuth salicylate, borax, caffeine, caffeine citrate, calcium hypophosphite, cerium oxalate, chloral hydrate, chloroform, cocaine hydrochloride, codeine, cotton, creosote, saccharated iron carbonate, iron and quinine citrate, exsiccated ferrous sulphate, reduced iron, tartrated iron, lithium carbonate, lithium citrate, magnesium carbonate, menthol, morphine hydrochloride, expressed oil of almond, oil of cloves, oil of cinnamon, oil of copaiba, castor oil, physostigmine sulphate, pilocarpine nitrate, potassium tartrate, acid quinine hydrochloride,

quinine sulphate, sodium arsenate, solution of lead subacetate, sulphur, terebene and veratrine.

THE B.P. AS A STANDARD.

By D. B. Dott.

The author is of opinion that, although the B.P. is admittedly the standard according to which pharmacists are bound to prepare all medicines which are official, the medicines must only be regarded as being of official standard when they are dispensed to the order of a physician, or where the conditions and circumstances of sale imply that the medicines are of that standard. He also opposes the idea that it should be considered possible to prove the presence of the full amount of any ingredient ordered in the B.P. formula for a given preparation some time after that preparation has been made. Examples are given of a few confused interpretations of the Pharmacopœia regarded as a standard, and it is suggested that a more intelligent and reasonable interpretation of existing laws be required.

LIQUOR FERRI PHOSPHATIS CUM QUININA ET STRYCHNINA.

By H. J. Henderson.

As a result of the examination of ten samples of liquor ferri phosphatis cum quinina et strychnina the author showed that all the samples which contained over 4 grammes of alkaloid in 100 c.c. gave unmistakable reactions for chlorides, a circumstance which points to the probable substitution of the acid hydrochloride of quinine for the less soluble sulphate. When it was found that sulphates were conspicuous only by their absence, the supposition received further confirmation. Of the other samples, one differed from the others in that it contained alcohol in considerable quantity, but the small amount of liquor at the disposal of the author made a trustworthy estimation of alcohol impossible. In two samples the alkaloidal contents were 1.30 and 1.25 per cent. respectively. Sulphates were present, but no chlorides were found. In another sample glycerin was found, the glycerin playing the double part of preservative and solvent. All these results tend to confirm the impression that a liquor ferri phosphatis cum quinina et strychnina, one volume of which when diluted with three volumes of simple syrup shall form

a syrup which shall represent the *syrupus ferri phosphatis cum quina et strychnina* of the Pharmacopœia, cannot be prepared. Three samples were labelled simply "liquor Easton," pro syrup. They, therefore, could not be understood to represent a liquor with which the official syrup could be prepared.

TINCTURES OF THE BRITISH PHARMACOPŒIA.

By J. C. McWalter.

The author gives the results of numerous determinations of the specific gravity of tinctures, and of the weights of residues left after evaporation of known volumes of such preparations. The latter show much greater variation than the specific gravities, and it is suggested that official standards for residues would be of but little use on account of the very wide limits that must be allowed.

ASAFETIDA PRÆPARATA.

By H. W. Jones.

In the purification of *asafetida* the author employs a method of precipitation as follows :

"One part of undried *asafetida* is treated with five fluid parts of alcohol (90 per cent.) in a closed jar in a water-bath, and solution effected by the aid of a little heat. The liquid portion was filtered off when cold and poured into ten times its bulk of water faintly acidulated with hydrochloric acid. After standing for twenty-four hours the precipitated mass, consisting of resins and essential oil, was collected on a calico filter, washed with water, scraped off into a shallow dish, and exposed to the air for a few days to allow of the evaporation of a small quantity of water appearing on the surface. The possible use of *asafetida* so prepared would be for pill masses in place of the powder, and it might also be used for the easy preparation of the tincture, in which case the use of rectified spirit, in place of the weaker alcohol now ordered, would be a distinct advantage."

LABORATORY NOTES.

By F. C. J. Bird.

Liquor Pancreatis, B.P.—The author finds that the test given for verifying the proteolytic activity of official pancreatic solution is not sufficiently definite, and that, at times, it is difficult to determine

the point at which coagulation no longer occurs. To remedy these defects Mr. Bird suggests the use of ether with nitric acid.

Aromatic Spirit of Ammonia.—The barium chloride test for carbonate in aromatic spirit of ammonia may be rendered more accurate by the addition of sodium or ammonium chloride.

Pepsin.—The solubility of pepsin in alcohol (90 per cent.) varies from 17 to 37 per cent.

LIQUOR FERRI PERCHLORIDE FORTIS.

By Thomas Tyrer and A. Levy.

The authors consider it probable that manufacturers do not make solutions of ferric chloride according to the method described in the Pharmacopœia, and they confirm the statement that commercial samples of the strong solution cannot be obtained of specific gravity 1.42.

PHENOL SUPPOSITORIES.

By F. R. Dudderidge.

The author deals with the difficulty experienced in removing phenol suppositories from the mould in hot weather. He finds that the presence of white beeswax tends to affect the physical consistence of the suppositories as well as to raise the melting point. Omitting the wax, he was able to prepare much more satisfactory articles, and it is suggested that the official formula should be modified accordingly.

NOTES ON OPIUM, OLIVE OIL AND SACCHARIN.

By E. Dowzard.

Opium.—The amount of morphine in dried and powdered opium varies from 12.3 to 14.9 per cent.

Olive Oil.—An examination of forty samples showed a specific gravity ranging between 0.9155 and 0.9165; seven a specific gravity of 0.915; four a specific gravity of 0.917, and one a specific gravity of 0.9172.

Saccharin.—The two commercial qualities of saccharin are determined by their solubility in acetone.

MERCUROUS IODIDE.

By Frederick B. Power.

The author summarizes the methods which have been advocated for the preparation of mercurous iodide, and gives the results of

determinations of the amount of iodine or pure mercurous iodide contained in specimens of the compound made in different ways. Those results indicate that precipitated mercurous iodide is quite uniform in composition and also sufficiently stable when properly protected.

COPAIBA OF BRITISH GUIANA.

By E. W. Bell.

As the result of an examination of a specimen of British Guiana copaiba, the author finds it to respond to all the characters and tests of the British Pharmacopœia, except as regards the optical rotation of the volatile oil, and, in that respect, the B.P. monograph is supposed to be in error. The official tests for copaiba are criticised generally, and it is suggested that there should be a definite method for obtaining the percentage of oil, preferably by evaporation at about 100° C.; it is also suggested that the rotation figures for the volatile oil should be lowered, that titration of the oleoresin be introduced and a resin factor added.

ASSAY APPARATUS FOR CHLORINE OR NITROGEN.

By J. F. Tocher.

A new form of apparatus for the determination of chlorine or nitrogen is described by the author. The advantages claimed for it are that loss of chlorine or ammonia is entirely prevented, whilst the condensing apparatus is much simplified, and the fluid and washings can be readily run off for titration, the apparatus then being ready for another operation. In nitrogen determinations the flask can be used with advantage in decomposing the nitrogenous substance prior to distillation and prevents possible loss in transference.

NUX VOMICA ASSAY.

By E. H. Farr and R. Wright.

The authors point out that the volume of liquid taken should not exceed 5 c.c. of liquid extract, or 30 c.c. of tincture, and that 200 c.c. of wash water at a stated temperature (38° C.) should be employed, a correction being made for the strychnine dissolved.

ASH IN DRUGS.

By C. G. Moor and M. Priest.

As a result of the determination of the ash of a number of B.P. drugs, the authors point out that in a few cases there should be some modification in the official limits—as, for instance, in cardamoms and colocynth pulp. It is suggested that the official ash limits might, with advantage, be considerably extended generally.

MELTING POINTS.

By T. Tyrer and A. Levy.

The substances recently examined by the authors are: salicylic acid, salol, carbolic acid, menthol and thymol. Commercial salicylic acid and thymol stand the B.P. test, but purified salol (recrystallized), carbolic acid and menthol must be taken if the official requirements are to be met. It is pointed out that no single method of determination is applicable to all pharmaceutical substances, and the authors propose to ascertain which methods are most applicable in particular instances.

BERBERINE PHOSPHATE.

By F. Shedden.

The author gives the composition of this salt as prepared by interaction of berberine acetone and an excess of phosphoric acid, and the interaction of mono-berberine sulphate and acid calcium phosphate as being $C_{20}H_{17}NO_4 \cdot 2H_3PO_4$, with varying amounts of water of crystallization.

VISCOSITY OF ESSENTIAL OILS.

By E. Dowzard.

A specimen of pure lemon oil had a viscosity of 139.6, whilst that of citrene was found to be 105.8, and that of a mixture of citrene with 7.5 per cent. of citral was 114.9. Assuming the viscosity of lemon oil to be fairly constant, such a test may be of some value, but examinations of authentic samples are required. The author therefore concludes that useful information may be obtained by determining the viscosity of essential oils.

TURPENTINE AND TEREBENE.

By C. T. Tyrer and A. Wertheimer.

The authors have made a careful physical examination of American, Russian and French turpentine oils and terebene made therefrom, and propose, at some future date, to investigate similar products from all possible sources. As a general rule, they find that the higher the initial rotation of American turpentine, the smaller is the product of inactive mixture capable of steam distillation and the higher the specific gravity. French turpentine has a greater tendency to oxidize than American, being intermediate between that and the Russian oil. The authors also find that, with proper attention to the conditions of manufacture, the requirements of the B.P. with regard to terebene, when prepared from American oil, can be reasonably complied with. From the results of their experiments the authors are inclined to doubt the existence, under ordinary conditions of manufacture, of a distinct inactive modification of the constituents of American turpentine or of terebene prepared therefrom.

SANDAL WOOD OIL.

By E. J. Parry.

Sandal wood oil consists of about 90 per cent. *santalol*, which is a mixture of two or more bodies of an alcoholic nature, to one of which the name *santalene* has been applied.

WASTE MENTHOL.

By A. W. Gerrard.

Waste menthol can be economically recovered in a pure state by crystallization from ether.

ALMOND OIL.

By W. C. Allen and E. T. Brewis.

The authors point out that, inasmuch as different countries—Morocco, Canary Islands, Portugal, Spain, France, Italy, Sicily, Syria and Persia—yield the principal supplies of almonds, we have to deal with the products of seeds grown under varying conditions of climate and soil. They are of opinion that the percentage of fixed oil present in the seeds does not exceed 45 per cent. from

sweet and 38 per cent. from bitter almonds. The almond oil of commerce is chiefly obtained from the latter, and, in view of the differing sources of supply, it is unreasonable to expect absolute uniformity in the results of color reactions, etc., though the differences are only slight, and never reach a limit that would cause difficulty in distinguishing genuine almond oil from adulterated oil. Expression is given to the opinion that adulteration of almond oil is comparatively rare, though substitution by peach or apricot kernel oils is common. These kernel oils, in turn, are adulterated with oils of cotton-seed, sesame, poppy, olive and arachis, only one out of seven representative samples having been recognized as unsophisticated kernel oil.

STROPHANTHUS.

By P. E. F. Perredis.

In a monograph on the pharmacognosy of official strophanthus seed, the author shows that every histological character upon which the identification of the different varieties of "Kombé" seeds has hitherto been based exists in seeds obtained from one and the same pod.

JAMAICA PLANTS.

By T. H. Wardleworth.

The author deals with the medicinal and economical plants of Jamaica.

INDIAN DRUGS.

By W. Mair.

The author submits details concerning the more important un-official drugs indigenous to British India and in actual use by native and European physicians.

NEW BOOKS.—John Wiley & Sons, New York City, announce the following new books: "Air, Water and Food from a Sanitary Standpoint," by E. H. Richards and A. G. Woodman; "The Cost of Living as Modified by Sanitary Science," by E. H. Richards; "Sewage and the Bacterial Purification of Sewage," by S. Rideal; "The Oil-Chemists' Handbook," by E. Hopkins. Dodd, Mead & Co. announce that the first edition of J. U. Lloyd's new book, "Stringtown on the Pike," will consist of 10,000 copies, and will appear October 1st.

INTERNATIONAL PHARMACEUTICAL CONGRESS.

The ninth International Pharmaceutical Congress was held, as previously announced (this JOURNAL, 1900, p. v), in Paris, August 3-8, 1900. While it is doubtful if anything of real value was done, it is a good thing to keep up the Congress, as eventually its work must take definite shape. We cannot but agree with the editor of the *Chemist and Druggist* when he says the making of an International Pharmacopœia is one "which chiefly concerns the Pharmacopœia Committees of the various countries. Committees representative of different countries have failed because they have wasted time over details; whereas, it is the principle that waits recognition, and the Pharmacopœia authorities are the people to act upon that." The account which we furnish our readers of the action of this Congress is taken from the issue of August 11, 1900, of that journal.

The meetings of the Congress were held in the *École de Pharmacie Supérieure*, and were very well attended.

The President, M. Petit, gave simply a cordial welcome to the visitors. The matter of

THE INTERNATIONAL PHARMACOPŒIA

was reported upon by Bourquelot, and a committee was appointed to make a report.

The conclusions arrived at by the committee were as follows :

(1) To prepare a table showing the differences in strength of medicaments bearing the same name in different Pharmacopœias.

(2) To unify this table.

(3) To ask that in future Pharmacopœias the strengths proposed be adopted, and attention called thereto in foot-notes.

(4) The members of the Congress—official and non-official—to do all they can to get the strengths adopted.

(5) To ask the Belgian government to arrange with other governments for a conference in Brussels, and to ask all the members to have their proposals ready to lay before the meeting whenever it may be called.

A. Tschirch submitted the following proposal relative to the International Pharmacopœia :

(1) A conference on this question will not succeed unless the nations most particularly interested (Germany, England, Austria,

Belgium, France, Italy, Russia and Switzerland) are represented by at least two delegates officially recognized by their governments. The other countries should, when possible, send their representatives. The governments of the principal States will thus show from the first that they are favorable to this unification.

(2) The conference will not attain its object unless it prepares a detailed program in advance. The fundamental principles, as also the proposals of the Belgian government, carefully studied and prepared, should be communicated beforehand to the administrators of medical affairs of the countries taking part in the conference. Moreover, the latter should be asked to consider these principles and contribute their opinions.

(3) All academies of medicine and all pharmaceutical societies should be asked to send a representative. It is desirable that these associations on their part discuss and study the scheme.

(4) The question cannot be solved by an improvised meeting of delegates little acquainted with it. It is only a carefully-thought-out scheme, discussed in a conference constituted as suggested, which could attain the end that all the world so earnestly desires.

THE STUDY OF PHARMACY.

Paul Jacob submitted a report on the preliminary education and compulsory examinations therein requisite before beginning the study of pharmacy. His conclusions were that there was a universal tendency in Europe to get the equivalent of the Bachelor of Arts grade, and while a certain importance is attached to the study of Latin, the tendency is to do away with the dead languages.

STANDARDIZATION METHODS.

The committee appointed at the last Congress to consider the subject of unification of assay processes had nothing to report, save that the subject was a difficult one of solution. Anton Altan, of Bucharest, submitted a long monograph on the narcotic extracts and their assay. The preparations dealt with were extracts of aconite, belladonna, henbane, digitalis, colocynth, cannabis indica, opium, ergot and nux vomica. He reviewed the methods of assay suggested by E. Dieterich, Kremel, Dunstan and Short, Kunz, Beckurts, Ranwez, Duyk, and others, as well as the pharmacopœial methods,

amongst the latter the processes of the Swiss and British Pharmacopœias being specially mentioned. Many results obtained by the author were given, and the monograph included a careful study of the volumetric methods of assay, Dieterich's, Beckurt's and Keller's being as far as possible compared. The author also submitted the necessity for uniform methods for estimating moisture, ash and potassium carbonate in the ash. The following are his recommendations:

Extract of Aconite.—The root to be exhausted with a menstruum composed of tartaric acid 1, alcohol 15, and water 30 (all by weight), by maceration (twenty-four hours) and percolation, the exhaustion being continued, if necessary, with a mixture of water 2, and alcohol 1. From 100 parts of aconite the first 80 parts of percolate should be reserved and the rest concentrated to 20. This 100 parts to be mixed well with 100 parts of alcohol. After standing forty-eight hours the clear liquid is decanted. The residue is dissolved in 10 parts of water, and 30 parts of alcohol added. After twenty-four hours the solution is filtered, mixed with the first clear portion, and evaporated to dryness.

Tests.—Twenty centigrammes of this extract is treated with 1 c.c. water, 8 c.c. ether and 5 drops of 10 per cent. solution of sodium hydrate, the ether decanted and evaporated. The residue should give a violet-brown coloration with phosphoric acid. Moisture, 2.49 to 5.10 per cent.; ash, 1.74 to 4.56; K_2CO_3 in ash, 27.6 to 50 per cent.; and the extract should contain 1 per cent. of alkaloids.

Extract of Belladonna.—The method is similar to the foregoing, but the menstruum is equal parts by weight of alcohol and water. Belladonna-root is recommended.

Tests.—The residue from the ether and alkali (ammonia) treatment should give a violet coloration with alcoholic solution of potash (Vitali's reaction), and it is to be distinguished from extract of henbane by the blue fluorescence of the chloroformic residue treated with ammonia (presence of chrysotropic acid). Moisture, 1.5 to 4.6 per cent.; ash, 4.45 to 8 per cent.; K_2CO_3 in ash, 46 to 56 per cent.; alkaloids, 1 per cent.

Extract of Henbane.—Prepared from the leaves with a menstruum consisting of water 30, and alcohol 15.

Tests.—Vitali's reaction: moisture, 1.43 to 5 per cent.; ash, 8.04 to 12.3; K_2CO_3 in ash, 34 to 60.2 per cent.; alkaloids, 0.5 per cent.

Extract of Nux Vomica.—The powdered drug to be freed from fat with ether, then exhausted with alcohol.

Tests.—Presence of brucine and strychnine proved: moisture, 0.4 to 2.8 per cent.; ash, 2.5 to 3.6 per cent.; K_2CO_3 in ash, 15 to 21.5 per cent.; alkaloids, 15 per cent.

Extract of Opium.—Prepared by exhaustion with water.

Tests.—Presence of meconic acid and morphine proved: moisture, 2.2 to 9 per cent.; ash, 5.4 to 7 per cent.; K_2CO_3 in ash, 0.1 to 2.5 per cent. Morphimetric process proposed is Dieterich's, 20 per cent. of morphine being the strength.

Extract of Digitalis.—Made from the leaves, like extract of belladonna.

Tests.—Moisture, 2.5 to 5 per cent.; ash, 8.14 to 9.6 per cent.; K_2CO_3 in ash, 2.5 to 6.2 per cent.; digitoxine, 1 per cent. Assay method given.

Extract of Ergot.—The powdered ergot is to be freed from fat with petroleum ether, and, after drying, it is exhausted by percolation with dilute alcohol. The percolate is acidulated with hydrochloric acid to precipitate sclererythrine, and, after filtration, neutralized with sodium carbonate and evaporated to dryness.

Tests.—Color reactions for cornutine: moisture, 1 to 10.5 per cent.; ash, 3.55 to 6 per cent.; K_2CO_3 in ash, 18.1 to 65 per cent.; cornutine, 0.15 per cent., by Keller's process.

Extract of Colocynth.—Made with alcohol.

Tests.—Color reactions: moisture, 0.9 to 6.5 per cent.; ash, 15 to 26.3 per cent.; K_2CO_3 , 36.3 to 60 per cent.

Extract of Cannabis Indica.—Prepared with alcohol. No tests given.

CAPSULING OF LIQUIDS AND SOLIDS.

Lépinos and Michel gave an interesting paper and demonstration of a method of capsuling liquids and solids. They first make gelatin or gluten tubes by, in the case of the gelatin tubes, dipping thin glass tubes, rubbed over with French chalk, into solution of gelatin melted in a water-bath. The solution is made according to the formula of the French Codex. When the gelatin is set the tube is slipped off the mould in the manner described in the *Chem. and Drug.*, winter number, 1900, in the article on gelatin capsules. The tubes are then filled, and having found out what quantity of a powder the

interior of the tube holds, a special pair of pincers is used to cut off the capsules at any desired distance. The pincers can be adjusted very accurately for this work. The resulting capsules are cushion-shaped, but can be rounded by trimming off the corners. M. Lépinos gave a demonstration of his method, and assured us that patients found no difficulty in swallowing the square capsules. The process was fairly quick, but did not seem to present many advantages over the hollow-capsule method used.

EMODINES.

Tschirch presented a paper on the emodines.

He has divided emodines into two classes, the first one containing rheum-emodin, frangula-emodin and cathartic-emodin, which give a deep-red color when treated with sulphuric acid and followed by ammonia; whilst the second class, containing aloes-emodin and senna-emodin, give a brighter red color with the same reagents. Professor Tschirch also distinguishes them by their melting points—the first group melting at 250° C., the second at from 223° to 224° C.

METHOD OF RAPIDLY WEIGHING EXTRACTS.

Brociner described a method for rapidly weighing extracts, in which a sliding weight is used on the beam to give the weight of a capsule, into which a quantity of any extract could then be weighed.

TARTAR EMETICS.

Baudan gave a rather scientific paper on the constitutional formulæ of these compounds.

CULTIVATION OF MEDICINAL PLANTS.

Bavay read a paper on the influence of cultivation on the activity of medicinal plants. He argued that in those plants which contain alkaloids the alkaloidal determination may be made the measure of success in cultivation, and instanced opium, cinchona, tobacco, coca and kola as proof thereof; but other drugs, such as henbane, digitalis, strophanthus, colchicum and aconite, also came into the reckoning. M. Bavay hazarded the suggestion that the failure of Jamaica cinchona to come up to the normal alkaloidal standard of the species grown is proof that proximity to the sea in-

fluences the value of the drug, as well as the altitude and soil. In fact, he regarded atmospheric humidity as an extremely potent influence in alkaloïd-production, instancing the great activity of Indian *Datura tatula*, as compared with *D. stramonium*, and how tobaccos vary in nicotine-content according to their geographical source. Opium gave him an interesting example, and he had figures to go upon; thus, at Amiens, in 1860, opium was made from poppies grown there which yielded 22.88 per cent. of morphine. Some produced in Auvergne gave 17.5 per cent. Smyrna opium, he said, yields 10 to 12 per cent., and that of India only 2 to 3 per cent. Is there not here, he queried, evidence that humidity of the air, as well as temperature, has a marked influence on the quality of the product? Then he quoted Flückiger and Hanbury's statement regarding annual and biennial henbanes, and mentioned the superiority of British digitalis over the continental, concluding with references to European, Indian and Japanese aconite, which gave a little too much credit to geographical difference and too little to difference in species.

CINCHONA CULTIVATION.

Three papers on cinchona cultivation were read: Verne dealing with the culture in the British and Dutch Indies. Reimers considered the subject from a general aspect. Reimers and Goris submitted suggestions for a monograph on the subject.

CONIFEROUS RESINS.

A. Tschirch presented a paper on some of the most recent researches in coniferous resins.

MENISPERMACEÆ.

Mahen gave the results of some work on the menisperms.

PELLETIER AND CAVENTOU MONUMENT.

The unveiling of the Pelletier and Caventou monument was, as expected, a most important and inspiring event. Moissan, in delivering the oration for the occasion, traced the career of the two *savants*, stating that Bertrand Pelletier, father of Joseph Pelletier, was a member of the Academy of Sciences and a pharmacist in Paris. Joseph Pelletier became a professor in the School of Phar-

macy at 26 years of age. He was a brilliant teacher, and his teaching exercised the greatest influence on his pupils. At a comparatively early age death took him from his family and from science. The Caventou family originated in Poitou, but the father of the *savant* was an army pharmacist in the Nord, Sambre and Meuse district. When he left the army he settled at St. Omer, near Calais. It was only natural that young Caventou should think of following his father's career. He went to Paris to study. He presented himself for the "internat" examination, and passed in 1815 at the head of all the candidates. In March of that year Napoleon returned from Elba. Caventou enlisted as a military pharmacist, and was sent to Waarden, a small Dutch town, where he remained till after Waterloo. The garrison would not believe the news of Napoleon's defeat until a French officer was sent to bear the news. Then they surrendered the fortress to the allies. Caventou was 20 years old at this time. He returned to Paris and studied at the School of Pharmacy and Faculty of Sciences, passed the "internat" examination, and was appointed pharmacist at St. Antoine Hospital. Here he made Pelletier's acquaintance, and their fruitful collaboration began. Chlorophyll, brucine, veratrine, quinine and other discoveries were the results of their united labors, and, as M. Moissan put it, "in four years the great family of alkaloids was established." M. Moissan explained the difficulties and dangers of administration of Peruvian bark before the discovery of quinine, and said that Pelletier and Caventou might be said to have carried out the idea of Paracelsus to have all medicaments reduced to active principles. He quoted the eulogium of Caventou pronounced at the Academy of Medicine by Dr. Bergerin, "Whatever revelations or deceptions the future reserves to medicine, one fact is absolutely established—the sovereign efficacy of quinine, not only for malarial fevers, but for a long series of pathologic conditions (from the majority of intermittent maladies to typhoid fever and acute rheumatism) of which the mere enumeration would fatigue the most patient audience." M. Moissan continued by sketching the difficulty experienced in getting quinine as a new remedy recognized, and paid a tribute to Dr. Maillot, the military surgeon, who introduced it into Algeria. He recalled the presentation of Pelletier and Caventou's thesis on their discovery to the Academy of Sciences on September 11, 1820, in which they stated that they had isolated cinchonine and quinine from both yel-

low and red cinchona bark, and described their therapeutic properties, which latter information received splendid confirmation from Algeria. In 1827 the Montyon prize was awarded to them, and Caventou filled with distinction the chair of toxicology in the Paris School of Pharmacy. M. Moissan concluded by saying: "We have associated the two *savants* on the same pedestal. We have rendered homage to Bertrand Pelletier and his son Joseph; we render homage to Joseph Caventou and his son Eugène, our dear colleague, whom we have here amongst us this morning."

M. Edmond Lepelletier, Municipal Councillor, in the name of the city, thanked those who had given Paris the handsome monument. The statue-mania had been severely criticised, he said, but their best answer was only to erect statues to glorious and beneficent men like Caventou and Pelletier. The schoolboy, returning from his studies, would ask why these men figured thus in a public place, and he would receive the explanation and look upon the figures with respect and admiration. Now-a-days, when Africa was being divided among the civilized nations, it was well to remember that Pelletier and Caventou, the discoverers of quinine, were the benefactors of the explorers and military men who had opened up the Dark Country to civilization. Statues were raised to generals and conquerors—their fame was but temporary—the only lasting conquests were those of science. He saluted these men, whose memory was henceforth draped in imperishable bronze.

M. de Mazières spoke in the name of the Parisian pharmacists. This, he said, was the first public statue erected to a pharmacist at Paris, or even elsewhere. It was true that Parmentier had his statue at Neuilly, and Planchon at Montpellier, but the one was erected in honor of the introducer of the potato into France, the other was for the services Planchon had rendered to the wine-growers. A few steps away were the statues of Vauquelin and Parmentier, but they were timidly placed in the forecourt of the School of Pharmacy—they had not dared to place them in the public streets. And why this absence of pharmacists' statues? Were they less worthy, less useful than others? By no means. But pharmacists were modest folk. Kept at their homes by their business, mixing little with the outside world, their exaggerated modesty prevented them from being recognized by the public. But is it so difficult to show the public that a pharmacist, instead of being a little retail shopkeeper, is a man of

varied knowledge? Simple facts show how useful he has been in the progress of chemistry and other sciences. Men like Scheele, Priestley, Davy, Baumé, Roliquet, Soubeiran and Pelouze were pharmacists, not to mention others who surround us at the present moment. "Let us," concluded M. de Mazières, "show all this; let us prove it by pointing to the venerated features of those who have preceded us. That is why this statue is erected to-day. We do not wish alone to ornament a public place—we wish to do a work of reparation and justice towards two famous pharmacists, and towards the noble profession they adorned. Pelletier and Caventou's image will rest here for long centuries; it will serve as an example to many generations of students who pass daily on their way to the lessons of their learned professors, and, at the same time, it will teach the crowd the lesson we had sought to teach, that pharmacists have, by their science and unselfishness, merited the title of 'benefactors of humanity.'"

M. Pelisse read an eloquent address prepared in the name of the General Association of French Pharmacists by M. Riethe, who was absent through a family bereavement. He spoke in the name of French pharmacists, saying that in this day of reparation 10,000 hearts in France and abroad, from famous professors to humble apprentices, would beat together in pride and joy at the honor done to the profession. Pelletier and Caventou united all the qualities—science, unselfishness, love of one's neighbor. "To the glory of pharmacy" might be the inscription engraved on the pedestal. Yes; from the humble *officines* of pharmacists this famous remedy had made its way over the entire world. Illustrious masters and humble practitioners of pharmacy joined hands in a common pride and a common hope. To those who were never tempted by vulgar publicity, international pharmacy to-day offered the tribute of its admiration. The lesson of all this was unity—let them profit by this Congress to unite among themselves, whatever their opinions or nation. They had united Pelletier and Caventou in one statue; at its feet let them unite themselves.

M. Guignard, Director of the School of Pharmacy, traced the career of Pelletier and Caventou at the School of Pharmacy. It was extremely unfortunate for the auditors that the rumble of traffic on this busy thoroughfare somewhat covered the voice of the eminent botanist. He alluded to the "two glorious and inseparable

names" of those whose "work, perseverance and devotion were an honor to the profession, to science and to humanity."

It may be explained that it was the erection of a monument to Dr. Maillot at Neuilly which gave the idea of starting the subscription for the Pelletier-Caventou monument. The statue is the work of M. Edouard Lormier, and the pedestal was designed by M. Georges Lisch, architect, who is a grand-nephew of Caventou.

RESULTS OF THE CONGRESS.

Crinon gave a report on the work of the Congress, in which he said:

The analytical methods for estimating the quantities of alkaloids and other active principles in simple drugs and galenicals were left to the International Pharmacopœia Committee to consider. The study of the influence of cultivation on the activity of medicinal plants had not yet advanced enough to take a definite vote on the subject; but it was recommended that pharmacologists take up the subject, and report to future Congresses. They had still to study the nature of the secretions and excretions of parasitic worms and what their influence is on the object they attack. The localization of the active principles in medicinal plants also required the further attention of pharmacologists. As to the unification of the methods of cultivation in bacteriology, it was still impossible to fix a universal plan, but pharmacists were invited to make out suggested lists. An ideal process for interpretation of the results of the analysis of urine has yet to be found. He advised pharmacists to follow Winter's method for analyzing gastric juice. Other urine-analysis questions were dealt with. The Professional Section of the Congress had voted the inspection of pharmacies to be desirable, if conducted by sworn government inspectors approved by societies of pharmacists. They thought the name of a medicament should not be allowed to be monopolized as a trade-mark, and that the limitation of the number of pharmacies is essential to the interests of pharmacists, but no decision as to the best system was come to.

It was considered that Latin is indispensable to pharmacists, and should be exacted from aspirants in every country. It was agreed that pharmacy is both a profession and a trade, but the professional side should not be submerged by the commercial.

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SEIDLITZ POWDERS.

BY JOSEPH HUNTINGDON.

Seidlitz powders, though seemingly prosaic and commonplace, have had quite a fair share of discussion.

Articles are frequently published in pharmaceutical journals in which seidlitz powders are treated of from different points of view, either with regard to the manner in which they are weighed, measured or divided, or as to their chemistry, their medicinal action, or the methods of dispensing them.

Druggists and writers sometimes collect samples from neighboring druggists and examine them to ascertain if they are of the standard required by the Pharmacopœia. Although it may be that considerable pains are taken, and a considerable amount of figuring resorted to, they seem to depend invariably upon the weights of the powders, and, by examining several, to gauge the average weight of the powders of each druggist.

No attempt is made to ascertain if the ingredients are sufficiently pure, or if they have been mixed in the proper proportions, or even if they contain those ingredients.

They might consist almost entirely of worthless or nearly worthless materials, and this might be intentional or unintentional. One of the first things the beginner learns is that seidlitz mixture consists of three parts of rochelle salt and one part of sodium bicarbonate. He has in his mind the figures 3 to 1, and unless his preceptor be watching him, he would possibly reverse the order and put in three parts of sodium bicarbonate and one part of rochelle salt. Simply weighing the powders would not indicate

anything like this, and it would be likely to pass unnoticed when the powders were mixed for drinking.

To make practical tests for the examination of seidlitz powders, materials were taken such as are ordinarily used in the drug store, and first examined qualitatively by the official tests.

The tartaric acid answered the official requirements with the exception of a slight cloudiness with barium chloride test solution. The ash amounted to .07 per cent. The loss of moisture on drying at 100° C. amounted to about .027 per cent.

The sodium bicarbonate gave a slight turbidity with silver nitrate test solution, with barium chloride test solution, and a slight coloration with hydrogen sulphide when followed by ammonia water. The loss of weight on heating at 100° C. amounted to 36.58 per cent. The Pharmacopœia gives about 36.3 per cent., a 98.6 per cent. salt being allowed. The theoretical amount for a pure salt is about 36.88 per cent.

The rochelle salt also proved to be very pure. It showed a slight coloration with hydrogen sulphide, and a slight turbidity with silver nitrate test solution. The loss in weight on heating at 100° C. amounted to about 23.35 per cent. Theoretically, rochelle salt contains about 25.52 per cent. of water of crystallization.

The drying of the salts was also tried at a temperature of 50° C., with the object of ascertaining if the adhering moisture could be estimated at that temperature without the loss of water of crystallization, or, in the case of the bicarbonate of soda, without decomposition. It was found that some decomposition did take place, and, also, so much time was required and the results so irregular as to be impracticable. Rochelle salt is somewhat efflorescent at the ordinary temperature in dry air, and sodium bicarbonate is very apt to decompose. Having examined the materials separately as to their quality, the sodium bicarbonate and rochelle salt were mixed in the proportions directed by the Pharmacopœia for seidlitz powders, for the purpose of examining quantitatively.

As both the constituents of seidlitz mixture are salts of alkali metals, they cannot be separated for estimation by precipitation. Nor do the acid radicals form any insoluble salts, so that the only practical way is to take advantage of the behavior of the components towards volumetric solutions before and after ignition.

The experiments made lead to the following suggestions for the qualitative and quantitative examination of seidlitz mixture:

Heated at 74° C. the mixture loses water and carbon dioxide, at a higher temperature is decomposed, froths, becomes brown, and gives off inflammable vapors having the odor of burning sugar, finally leaving a residue consisting of alkaline carbonates mixed with carbon.

With silver nitrate test solution a solution of the mixture yields a white precipitate, which becomes black on boiling. If the white precipitate is dissolved by the addition of a few drops of ammonia water, a silver mirror will be produced on heating. The solution of the mixture, acidified with acetic acid, yields a yellow precipitate on the addition of sodium cobaltic nitrite test solution.

Arsenic, Lead, Copper, etc.—A small quantity of the seidlitz mixture slightly supersaturated with hydrochloric acid, and followed by an equal volume of hydrogen sulphide test solution, should not be rendered turbid.

Iron, Aluminum, etc.—The clear filtrate from the above should not be rendered turbid on slight supersaturation with ammonia water.

Chlorides.—If 1.2 grammes of seidlitz mixture be dissolved in 10 c.c. of dilute nitric acid, then .5 c.c. of decinormal silver test solution added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected on the further addition of silver nitrate test solution.

Sulphate, Sulphite and Hyposulphite.—If 2.5 grammes of seidlitz mixture be dissolved in 11 c.c. of dilute hydrochloric acid, then .1 c.c. of nitric acid and .25 c.c. of decinormal barium chloride test solution added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride test solution.

Calcium.—The aqueous solution should not be rendered turbid by ammonium oxalate test solution.

Sulphocyanate.—The aqueous solution slightly supersaturated with hydrochloric acid should not be colored red by a drop of ferric chloride test solution.

Quantitative Tests.—If 2 grammes of the mixture of sodium bicarbonate and rochelle salt be dissolved in water, normal sulphuric acid volumetric solution added until effervescence ceases, and the solution is strongly acid, then boiled for five or ten minutes, phenolphthalein test solution added, and the excess of acid neu-

tralized by normal potassium hydrate volumetric solution, it should be found to require not more than 5.96 c.c. of sulphuric acid volumetric solution to produce a neutral solution (corresponding to 25 per cent. of sodium bicarbonate, each cubic centimetre being the equivalent of .08385 gramme).

If 2 grammes of the mixture be again taken, this thoroughly ignited in a platinum crucible, the crucible with ash adhering boiled in distilled water until the ash is dissolved, then normal sulphuric acid volumetric solution added in excess as before, boiled, phenolphthalein added, and the excess of acid neutralized with normal potassium hydrate volumetric solution, the number of cubic centimetres of acid found to be required, minus 5.96 (the amount required for the sodium bicarbonate alone), should leave not less than 10.65 c.c. (corresponding to 75 per cent. of rochelle salt, each cubic centimetre being the equivalent of .140755 gramme).

The Pharmacopœial blue powder containing 2.583 grammes of sodium bicarbonate would require, theoretically, 2.305 grammes of tartaric acid to exactly neutralize $83.85 (\text{NaHCO}_3) : 74.82 (\frac{1}{2}\text{H}_2\text{C}_4\text{H}_4\text{O}_6) :: 2.583 : 2.305$, while the amount given is 2.25 grammes, leaving a deficiency of nearly 1 grain. It might be claimed that, as the sodium bicarbonate of the Pharmacopœia is allowed to be of only 98.6 purity, this would make an acid solution. Further calculation showed that it does not. If a 100 per cent. pure sodium bicarbonate required 2.305 grammes of tartaric acid, a 98.6 per cent. salt would require 2.273 grammes, $100 : 98.6 :: 2.305 : 2.273$. These figures are for a tartaric acid of absolute purity, whereas it is most likely to be at least a fraction of 1 per cent. short of this, while there is good reason to believe that most of the sodium bicarbonate now on the market comes well within the official requirements. The official quantity of tartaric acid, if absolutely pure, would only be equal to a sodium bicarbonate of 97.6 per cent. purity, 2.583 (official quantity) : 2.5215 (equivalent quantity) :: $100 : 97.6$.

The tartaric acid was estimated by the official process with potassium hydrate, but to avoid precipitation of potassium bitartrate it is recommended to titrate in hot solutions.

The methods for the examination of seidlitz powders having been described, the results upon six samples are given.

The blue and white powders are considered under separate head-

ings. As the weight is of importance, whether the ingredients are pure or not, the weights of two powders of each druggist are given, followed by the results of tests of identity and of purity, and, finally, the proportions of the ingredients found by quantitative examination.

When the powders obtained came to be examined quantitatively, an unexpected difficulty presented itself. When the percentages of the two ingredients obtained by titration in the described methods were added together, instead of the result being about 100 they all were considerably above that. No. 1, for example, gave 31.44 per cent. of sodium bicarbonate and 85.86 per cent. of rochelle salt, which, added together, make 117.3 per cent. There is only one way in which it can reasonably be explained, that is, by the loss of moisture. In making the first experiments the ingredients were freshly taken from tight containers, so that they had not the chance to lose moisture. The seidlitz powders, on the other hand, contained in paper, a condition highly favorable to loss of moisture, and probably made some time before they were obtained, were kept for some time in a rather hot room before they were examined. Rochelle salt is described by the Pharmacopœia as being somewhat efflorescent, and the results obtained proved that sodium bicarbonate also loses considerable weight under the described conditions. It is obvious, then, that some change in the foregoing calculation would have to be made.

Thus, No. 1, as before mentioned, gave 31.44 per cent. of sodium bicarbonate and 85.86 per cent. of rochelle salt, the total being 117.3 per cent.; then $117.3 : 31.44 :: 100 : 26.805$, and in the same way for the rochelle salt, $117.3 : 85.86 :: 100 : 73.1$.

All that is necessary with regard to the directions for quantitative analysis would be to make the above calculations in case the results of the analysis give over 100 per cent.

This, however, still leaves something to be desired. It only shows the relative proportions of pure bicarbonate of soda and pure rochelle salt in the mixture. It does not show the absolute amount of pure materials in 100 parts of the mixture; in other words, the two percentages will be always 100. If sodium bicarbonate which contained normal carbonate had been originally used in making the seidlitz mixture, it would not enable the amount of that impurity to be calculated. It would be calculated into bicar-

bonate, and the rochelle salt per cent. correspondingly lessened to make 100.

It would probably convey a better idea of the value of the powders if they were to be compared with the official powders, judging from the amount of anhydrous rochelle salt found in the samples. In this way both the absolute weight of the powders and their composition would be taken into consideration. For this purpose the mean of the two weights given was taken as the average weight of the powders of each druggist, and the total quantity of anhydrous rochelle salt in the sample calculated from the results of the analysis. No. 1 being again taken as the example, the mean of the two weights is 4.55 grammes. Two grammes of the mixture required 12.2 c.c. of normal sulphuric acid to neutralize the ash from the rochelle salt. 12.2 c.c. are equal to 1.279 grammes of anhydrous rochelle salt, $104835 \times 12.2 = 1.278987$. If 2 grammes of the mixture contain 1.279 grammes of rochelle salt, 4.55 grammes would contain 2.909 grammes, $2 : 1.279 :: 4.55 : 2.909$, so that each of the powders of that particular druggist contains about 3 grammes of anhydrous rochelle salt. The official powder contains about 5.77 grammes of anhydrous rochelle salt.

BLUE POWDERS.

No.	Weights in Grammes.	Results of Qualitative Analysis.	Sodium Bicarbonate.	Rochelle Salt.	Anhydrous Rochelle Salt in Average Powder.
1	{ 4.4 4.7 }	Traces of iron and chlorides. }	26.8 per cent.	73.1 per cent.	3 grammes.
2	{ 10.4 10.5 }	Traces of iron and sulphates. }	23.89 " "	76.1 " "	7.08 "
3	{ 11.85 11.6 }	Traces of calcium sulphates and iron. }	26.32 " "	73.65 " "	7.37 "
4	{ 10.6 10.4 }	Traces of chlorides and sulphates. }	23.48 " "	76.52 " "	7.26 "
5	{ 11. 9. }	Trace of sulphates. }	41.03 " "	58.52 " "	4.98 "
6	{ 8.4 7.7 }	Traces of iron chlorides and sulphates. }	26.8 " "	73.19 " "	5.21 "
U.S.P.	10.333	—	25.0 " "	75.0 " "	5.77 "

WHITE POWDERS.

No.	Weights in Grammes.	Results of Qualitative Examination.	Estimation.
1	2'42, 2'6	Trace of lead.	99'11 per cent.
2	2'37, 2'289	Traces of sulphates.	99'69 " "
3	2'56, 2'635	Slight trace of lead.	99'8 " "
4	3'275, 3'4	Slight trace of lead.	99'72 " "
5	2'41, 2'34	Trace of sulphates.	98'79 " "
6	2'505, 2'495	Trace of sulphates.	99'23 " "
U.S.P.	2'250	—	—

The tests of identity indicated tartaric acid, and the qualitative tests showed no impurities except those shown in the table.

COMMENTS ON THESE SEIDLITZ POWDERS.

The first powder on the list proved to be a little interesting. Although the ingredients for the blue powder are in about the proper proportions, the powder is about half the weight which it ought to be, while the tartaric acid powder belonging to it is even heavier than it ought to be. There is an excess of nearly $1\frac{1}{2}$ grammes of tartaric acid, so that those powders would make a very acid mixture. It will be noticed that every one of the tartaric acid powders is heavier than the official powder, which is 2'25 grammes in weight, showing plainly the carelessness in preparing them. No. 4 is over 1 gramme heavier than it ought to be.

Nos. 2, 3 and 4 are higher in rochelle salt than the official. No. 5 falls considerably below the official strength, although the powders are about the full weight, the reason being that the mixture contains 41 per cent. of sodium bicarbonate, when it should contain only 25 per cent. Dishonesty was evidently intended in this case. No. 3 is a brand of seidlitz powders regularly put up by a reputable manufacturing firm in this city. It is of very good quality, as can be seen. Sufficient has been shown to indicate that it is necessary to examine seidlitz powders quantitatively if a correct idea of their worth is to be obtained.

SYRUP FERROUS IODIDE.¹

BY H. LIONEL MEREDITH.

This paper is to be regarded as an answer to the query: "Glucose and glycerin have both been recommended as preservatives for syrup ferrous iodide. Does the presence of either or both these substances really improve the keeping quality of this syrup beyond that of the U.S.P. article? If so, suggest a formula." We find that as early as 1857 Mr. Frederick Stearns suggested the use of glycerin as an entire substitute for syrup in preparing this preparation, thus making a sort of glycerite instead of a syrup; and in the following year Dr. Henry Thayer advocated partial replacement of the syrup by this same body, thus preserving the title of the preparation, and obtaining the same effect only to a proportionate degree.

Medicinally, glycerin is not objectionable; indeed, in instances it is to be preferred to syrup. In the first place, because sugars of the disaccharide class of carbohydrates are contraindicated in many diseases; then, too, this class of sugars are not digestible until converted by the stomachic secretions into a type of invert sugar, which change frequently progresses to an advanced stage and produces what is known as "acidity of the stomach," or "fermentative indigestion." Glycerin is open to no such criticism.

The effect of iodine upon sugar was noticed by Lassaigne as early as 1833; that by prolonged boiling of iodine with a solution of cane sugar he obtained a colorless solution; and Millon, in 1845, asserted that iodoform was formed by him by elevating the temperature of a glucose solution to which iodine had been added, the reaction taking place in the presence of an alkaline carbonate.

Prof. John M. Maisch, in 1857, noted that direct sunlight would restore the proper color conditions of a discolored syrup of ferrous iodide, while the sunheat, without sunlight, would not accomplish the same end. The results of these early investigators seem to indicate that preservation and decolorization are brought about by a process of reduction; that as fast as the syrup had been oxidized and iodine liberated, it in turn was reduced and hydriodic acid formed as a product of that reduction.

¹Abstract of a paper read at the Maryland Pharmaceutical Association, June, 1900.

To prove that glucose does reduce iodine and forms hydriodic acid, we carried out the following: A glucose solution, neutral reaction, was taken and solution of iodine added until a slight color was imparted to the glucose; a gentle heat was then applied, color disappearing. Reaction was then found to be acid to litmus; with starch paste no color was noted, while upon the addition of a small quantity of chlorine water a deep blue color was obtained. We then took 10 c.c. of the solution, added NH_4OH to neutralization, and titrated with decinormal AgNO_3 V. S. (using a few drops K_2CrO_4 T. S. as indicator) until we obtained a permanent pink tint, which required 5.5 c.c. of the AgNO_3 V. S., corresponding to $\frac{1}{2}$ per cent. absolute HI. We conclude that hydriodic acid is formed as a product of reduction, and that while the syrup is constantly kept of a light color, it is none the less true that hydriodic acid is being formed.

This being true, we ultimately have a preparation which partakes to a degree, at least, of the nature of an iodine preparation, medicinally, as well as an iron preparation; granting, of course, that this change is an exaggerated incident, as such change would require a long period for consummation, and is merely cited to impress the chemistry of the action of glucose.

NOTE.—Should a preparation of 10 per cent. ferrous iodide in a glucose solution, specific gravity 1.40, be kept so long as to permit of the glucose exercising its limit of reducing influence upon iodine liberated, we would have a preparation containing hydriodic acid about $\frac{1}{2}$ per cent., ferrous iodide, 9.358 per cent. Thus: 10 per cent. by weight of ferrous iodide would contain 14 grammes in 100 c.c. (specific gravity glucose solution, 1.40), of which 11.467 grammes would be iodine. Thus:

$$\begin{array}{l} \text{Mol. Mol.} \\ \text{Wgt. Wgt.} \\ \text{FeI}_2 : \text{I}_2 :: 14 \text{ grammes} : \text{X (gramme I).} \\ 308.94 : 253.06 :: 14 \text{ grammes} : \text{X (= 11.4677 grammes I in 14 grammes FeI}_2\text{).} \\ 308.94 \text{ X} = 3542.84 \text{ grammes.} \\ \text{X} = 11.4677 \text{ grammes I.} \end{array}$$

In $\frac{1}{2}$ per cent. HI in glucose (specific gravity, 1.40) we would have 0.7 gramme HI (absolute) in 100 c.c. solution.

Then:

$$\begin{array}{l} \text{Mol. Atom.} \\ \text{Wgt. Wgt.} \\ \text{HI} : \text{I} :: 0.7 \text{ gramme} : \text{X (gramme I).} \\ 127.53 : 126.53 :: 0.7 \text{ gramme} : \text{X (= .69451 gramme I in 0.7 gramme HI).} \end{array}$$

This being the *limit* to the reducing power of glucose upon iodine.

Then:

$$\begin{array}{l} 11.4677 \text{ grammes I in 10 per cent. FeI}_2 \text{ (100 c.c.) less} \\ \underline{.6945 \text{ gramme I in 12 per cent. HI (100 c.c.) equals}} \\ 10.7732 \text{ grammes I remaining as FeI}_2. \end{array}$$

By way of summary, then, we note that glycerin is a preservative by simply preventing oxidation.

That it assimilates iodine, after liberation, in a non-irritating form, in which form it may be easily taken up by the system, *as iodine*, and does not act as an iron preparation.

That glycerin is not objectionable in the preparation, as it is an easily assimilated food for the organism.

That glucose is a better preservative; in fact, a good, almost ideal preservative, acting, as it does, both by preventing oxidation and reducing the iodine *after* liberation.

That as a product of oxidation we get ferrous oxide and free iodine, and by reduction we have formed hydriodic acid, and ferric sesquioxide by final oxidation.

That, medicinally, glucose is a directly fermentable sugar, easily digested, in fact, a partially predigested food.

That glucose is medicinally valuable, inducing copious polyuria; does not pass into the urine, but is oxidized and consumed in the organism, thus acting as a typical food.

Then :

Mol. Wgt.	Mol. Wgt.	
FeI ₂	I ₂	:: X (gramme FeI ₂ remaining in 100 c.c.) : 10'7732 grammes I (as FeI ₂).
308'94	253'06	:: X (gramme FeI ₂ remaining in 100 c.c.) : 10'7732 grammes I (as FeI ₂).
	253'06	X = 3328'232408 grammes.
		X = 13'1124 grammes FeI ₂ remaining in 100 c.c. of preparation.

Now, as we have seen above,

14 grammes = 10 per cent. by weight FeI₂ in glucose preparation (specific gravity, 1'40), therefore,

13'1124 grammes = 9'358 per cent. by weight FeI₂ remaining after reduction; remembering that to accomplish this degree of reduction would require a prolonged period of continued decomposition and reduction.

The formula for preparation should read :

Iron (in bright wire)	27 grammes (an excess).
Iodine (resublimed)	86'72 "
Glucose solution (specific gravity, 1'40).	
Distilled water	120 c.c.
To make	1,000 grammes.

Standardize the finished preparation to 10 per cent. by weight strength by the usual method of adding an excess of $\frac{N}{10}$ V. S. AgNO₃, diluted HNO₃, and [Fe₂(NH₄)₂(SO₄)₄ + 24H₂O] V. S. and titrating back the excess of $\frac{N}{10}$ V. S. AgNO₃ with $\frac{N}{10}$ V. S. KCNS to permanent tinting.

That glucose is found in the normal healthy juices, being the form of sugar into which starchy and saccharine substances are converted by amylopsin and allied ferments, that they may become soluble, digestible compounds.

For a working formula for syrup ferrous iodide with glycerin we find that by replacing half the syrup by glycerin a much more stable preparation is obtained than by the entire substitution of glycerin for syrup. Then, too, heat in excess should be avoided with the finished preparation, lest a more or less disagreeable odor be developed of an "allyl" character. For these experiments we used the formula as prescribed by the U.S.P., with the changes noted above. We *do not* consider the use of glycerin at all advantageous.

For the formula for the use of glucose we first prepared a glucose solution of 1.40 specific gravity (as this high specific gravity is less likely to undergo acetous fermentation) and used the spirit of the U.S.P. formula. First experiment showed in a short time a precipitate at first flocculent, finally more or less dense.

Upon carrying out a few tests, we discovered the presence of a trace of sulphates and an abundance of chlorides; after eliminating the chlorides with silver nitrate, T. S. (in treating the glucose solution, with the object of eliminating chlorides, the solution (specific gravity, 1.40) was reduced to one having a specific gravity 1.10, and titrated with $\text{Ag}.\text{NO}_3$, T. S., until no further trace of chlorides was noted; filtered and again concentrated to specific gravity 1.40, we again carried out the above experiment, using the glucose solution; specific gravity, 1.40, reaction neutral. The result was a clear, permanent preparation.

We then tried half syrup and half glucose solution, with like result; yet this latter would not necessarily be as permanent as the preceding.

After two months' standing each specimen showed a *slightly* acid reaction. In closing this article, we wish to make prominent a few points to be observed in making the official syrup, the non-observance of which is the cause of much of the decomposition met with in practice. The sugar should be free from ultramarine, as this will cause a slight reddening of the finished syrup.

The specific gravity should be at least 1.35.

The water used should be distilled and free from ammonia, as ferrous iodide is an excellent reagent for this gas, and with it gives a yellowish-brown coloration.

Observe that oxidation does not begin before the preparation has been finished.

Remember that a darkening color does not always indicate presence of iodine; it may be due to the fact that caramelization has begun.

It is bad pharmacy to reclaim syrup ferrous iodide too often.

Always boil the water before using, to dispel ammonia, carbon dioxide and other volatile impurities.

It is a good point when following the official directions to "heat the solution to boiling," after "having lost the odor of iodine," to *heat the solution in a water-bath*, for by the use of direct heat the solution is often slightly reddened, due to a scorching caused by too high temperature.

Filter always through rapid-acting Swiss (or otherwise pure) filter paper.

We deem it a good plan to heat the finished syrup to boiling, to dispel any free iodine, by converting it to hydriodic acid by the aid of the invert sugar caused by boiling the cane sugar solution.

ASSAY OF DRUGS BY THE USE OF LIVING PLANTS.¹

BY HENRY KRAEMER.

While I have a certain amount of hesitation in presenting the results recorded in this paper at the present time, it nevertheless seems to me that more would be gained by such a procedure than by withholding them for a longer time in order to accumulate more data, and in support of this position permit me to quote the following from Montesquieu: "When you treat a subject, it is not necessary to exhaust it, it is enough if you cause thought."

The subject of the testing of drugs by means of their effects upon living plants is not an entirely new one, as I supposed and ventured to state in my paper on "The Valuation of Drugs and Foods" a year ago. In fact, methods of this kind have been employed to a considerable extent in Europe and appear to be of fundamental importance in ascertaining the toxic properties and therapeutic value of drugs. No less an authority than Köbert, in his "Lehrbuch der Intoxicationen" (1893), says that, after one has obtained the substance relatively pure and made a neutral solution, "Der Gang der Untersuchung ist nun der, dass man erst den Einfluss auf möglichst

¹ Presented at the American Pharmaceutical Association meeting, May, 1900.

niedrige Wesen pflanzlicher und thierischer Natur, dann auf höhere kaltblutige und deren einzelne möglichst isolirte Organe oder Stückchen derselben und zuletzt auf die Warmblüter in aufsteigender Reihe untersucht, so dass von Längern erst Pflanzenfresser, dann Fleischfresser, dann Omnivoren, dann körner- und fleischfressende Vögel und erst dann Menschen als Reagens benutzt werden und zwar zuerst der Experimentator, dann andere gesunde Menschen, dann Patienten. *Das Leibmotiv für alle Versuche und namentlich für die Reihenfolge derselben soll das Mitgefühl für die armen gequälten Geschöpfe sein.* Man stellte daher Punkte, welche an niederen Wesen untersucht werden können, nicht ohne Noth an höheren fest. Das am wenigsten gequälte Wesen soll natürlich der kranke Mitmensch sein. Es muss daher als ein Act der Barberei und mangelhafter pharmakologischer Erziehung gebrandmarkt werden, dass sich noch immer Aerzte finden lassen, welche Mittel von schwankender oder unbekannter Zusammensetzung und Wirkung sofort an den Patienten ihrer Praxis aufs Gerathewohl hin zu frufen sich bereit finden lassen."

The following plants or parts of them have been employed in experiments of this kind: bacteria, *Oscillaria*, *Spirulina*, *Nostoc*, *Zygnema*, *Spirogyra*, *Chara*, *Drosera*, *Tradescantia*, yeasts, species of *mucor*, *Elodea*, *Lemna*, *Pistia*, *Potamogeton*, *Myriophyllum*, *Ceratophyllum*, grasses, lentels, beans, peas, etc. (See Kobert, *loc. cit.*)

The data herewith presented are the results of experiments which were carried out under my direction by Willard Ohliger in the Botanical Laboratory of the Philadelphia College of Pharmacy. When the work was undertaken it was hoped that a number of drugs could be experimented with and also a number of plants, but up to the present it has been found impossible to extend the experiments further than those which follow. The plants used in these experiments were: Seedlings of *Lupinus albus* and *Pisum sativum*, L. The following are the substances which were used in experimenting upon these plants: Ethyl alcohol, strychnine nitrate, brucine sulphate, tincture of nux vomica, U.S.P., and tincture of nux vomica free from fat.

METHOD OF TESTING.

The seeds of the above-named plants were first soaked in water for twenty-four hours, after which they were placed on moistened excelsior, arranged in such a manner as to be covered with a bell-

jar. This was then placed in a dark room and germination of the seeds allowed to proceed until the radicles acquired a length of from 25 to 30 millimetres. The radicles were then marked with India ink 20 millimetres from their tips and placed in the solutions of the different drugs. The containers used for the solutions were 50 c.c. glass vials, which were perfectly clean. The method found best adapted for supporting the seedlings was as follows: The vials containing the solutions were arranged in a circle on a plate and a large cork placed over them in such a way as to come partly over the mouth of each vial. To this cork the seedlings were attached by means of small staples or double-pointed tacks, so as to immerse the radicles in the solutions. The vials were then covered with a bell-jar and placed in a dark room. After a period of twenty-four hours the seedlings were removed from the solutions, and the radicles carefully measured to ascertain their length of growth. They were then replaced in the solutions and allowed to stand another twenty-four hours, when measurements were again made.

In cases of death the radicles presented a flabby and transparent appearance, and in a few cases they were shorter than at the beginning of the experiment.

In the first series of experiments alcoholic solutions were employed in order to obtain the constant for that liquid, as it was likely to be employed in the preparation of the solutions of the various drugs to be tested.

The following table gives the strength of alcohol employed, the actual growth of two seedlings of *Pisum sativum* and two of *Lupinus albus* in twenty-four hours and the temperature at which the experiments were performed, this temperature being adopted like wise for the succeeding experiments.

In the following experiments it is seen that no growth of the root occurred in the solution containing 7 per cent. of alcohol, and that in the solutions containing between 6 per cent. and .5 per cent. there was a gradual increase in the length of the root according as the strength of alcohol in the solution was diminished, and that in the solutions containing .1 per cent. and .5 per cent. there was a slight increase in growth over those contained in weaker solutions. It may be stated here that in distilled water *Pisum sativum* grew 18 millimetres and *Lupinus albus* 19 millimetres in twenty-four hours.

In the succeeding table the lengths of the roots at the end of the second twenty-four hours are given:

ETHYL ALCOHOL.

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
'01	{ 9' mm. 9' "	} Apparently normal	{ 14'5 mm. 15' "	} Apparently normal.
'1	{ 10'5 " 11' "	} Crooked	{ 16' " 16'5 "	} " "
'5	{ 10' " 10' "	} Apparently normal	{ 15'5 " 15'5 "	} " "
1'	{ 8'5 " 8'5 "	} " "	{ 13' " 14' "	} " "
2'	{ 8' " 8' "	} " "	{ 11'5 " 12'5 "	} " "
3'	{ 6' " 7' "	} " "	{ 9' " 8'5 "	} " "
4'	{ 4' " 4'5 "	} " "	{ 5' " 4'5 "	} " "
5'	{ 2' " 2' "	} " "	{ 2' " 1' "	} " "
6'	{ 1' " 1' "	} " "	{ No growth	} Dead, flabby.
7'	{ No growth	} Dead, flabby	{ —	} —

ETHYL ALCOHOL.

Temperature (16°-21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
'01	{ 15' mm. 15' "	} Apparently normal	{ 19'5 mm. 20' "	} Apparently normal.
'1	{ 16'5 " 17' "	} Crooked	{ 22' " 22' "	} " "
'5	{ 16' " 16' "	} Apparently normal	{ 21' " 21' "	} " "
1'	{ 13' " 12'5 "	} " "	{ 18' " 19' "	} " "
2'	{ 11' " 11' "	} " "	{ 14'5 " 15'5 "	} " "
3'	{ 8'5 " 9'5 "	} " "	{ 13' " 13' "	} " "
4'	{ 5' " 5' "	} " "	{ 5'5 " 5'5 "	} " "
5'	{ 2' " 2' "	} " "	{ 2' " 1' "	} " "
6'	{ 1' " 1' "	} Flabby	{ No growth	} Dead.
7'	{ No growth	} Dead	{ —	} —

STRYCHNINE NITRATE.

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{30}{100}$ gr. or '0022 gm.	{ 10' mm. 10' "	} Apparently normal	{ 15'5 mm. 15'5 "	} Apparently normal.
$\frac{20}{100}$ gr. or '0032 gm.	{ 8'5 " 9' "	} " "	{ 15' " 15' "	} " "
$\frac{15}{100}$ gr. or '0043 gm.	{ 10'5 " 10'5 "	} " "	{ 16' " 16' "	} " "
$\frac{12}{100}$ gr. or '0054 gm.	{ 6' " 5'5 "	} " "	{ 10' " 10' "	} " "
$\frac{10}{100}$ gr. or '0065 gm.	{ 5' " 5' "	} " "	{ 8'5 " 7'5 "	} " "
$\frac{8}{100}$ gr. or '013 gm.	{ 4'5 " 4' "	} " "	{ 6'5 " 6' "	} " "
$\frac{6}{100}$ gr. or '025 gm.	{ 3' " 3' "	} " "	{ 4'5 " 4' "	} " "
$\frac{4}{100}$ gr. or '039 gm.	{ 2' " 1'5 "	} " "	{ 3' " 3' "	} " "
$\frac{2}{100}$ gr. or '052 gm.	{ 1' " 1' "	} " "	{ 2' " 2' "	} " "
1 gr. or '065 gm.	{ No growth	} Dead, flabby	{ No growth	} Dead, flabby.

STRYCHNINE NITRATE.

Temperature (16°-21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{30}{100}$ gr. or '0022 gm.	{ 16' mm. 16' "	} Apparently normal	{ 25' mm. 25' "	} Apparently normal.
$\frac{20}{100}$ gr. or '0032 gm.	{ 15'5 " 15' "	} " "	{ 24' " 24' "	} " "
$\frac{15}{100}$ gr. or '0043 gm.	{ 17' " 17' "	} " "	{ 26' " 26' "	} " "
$\frac{12}{100}$ gr. or '0054 gm.	{ 14' " 13' "	} " "	{ 22' " 22' "	} " "
$\frac{10}{100}$ gr. or '0065 gm.	{ 7' " 7' "	} " "	{ 9' " 8' "	} " "
$\frac{8}{100}$ gr. or '013 gm.	{ 5'5 " 6' "	} " "	{ 7' " 6' "	} " "
$\frac{6}{100}$ gr. or '025 gm.	{ 4' " 4' "	} " "	{ 5' " 5' "	} " "
$\frac{4}{100}$ gr. or '039 gm.	{ 2' " 2' "	} " "	{ 3'5 " 3' "	} " "
$\frac{2}{100}$ gr. or '052 gm.	{ 1'5 " 1'5 "	} Transparent	{ 2'5 " 2' "	} Transparent.
1 gr. or '065 gm.	{ No growth	} Dead	{ No growth	} Dead.

BRUCINE SULPHATE:

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{30}$ gr. or '0022 gm.	{ 10'5 mm. 10'5 "	} Apparently normal	{ 16' mm. 16'5 "	} Apparently normal.
$\frac{1}{20}$ gr. or '0032 gm.	{ 9' " 9'5 "	} " "	{ 15' " 15'5 "	} " "
$\frac{1}{15}$ gr. or '0043 gm.	{ 11' " 12' "	} " "	{ 16'5 " 17' "	} " "
$\frac{1}{12}$ gr. or '0054 gm.	{ 11'5 " 13' "	} " "	{ 17' " 17'5 "	} " "
$\frac{1}{10}$ gr. or '0065 gm.	{ 7'5 " 7' "	} " "	{ 10' " 11' "	} " "
$\frac{1}{8}$ gr. or '013 gm.	{ 6' " 6'5 "	} " "	{ 9' " 9'5 "	} " "
$\frac{3}{8}$ gr. or '025 gm.	{ 5' " 5' "	} " "	{ 6' " 6' "	} " "
$\frac{2}{5}$ gr. or '039 gm.	{ 3'5 " 3' "	} " "	{ 4' " 4'5 "	} " "
$\frac{1}{4}$ gr. or '052 gm.	{ 2' " 2' "	} " "	{ 3' " 3' "	} " "
1 gr. or '065 gm.	{ No growth }	} Dead	{ 2' " 2'5 "	} " "
$1\frac{1}{2}$ gr. or '078 gm.	{ — }	} —	{ No growth }	} Dead.

These experiments show that the seedlings growing in the solution containing but .01 per cent. alcohol still grew slightly less than those in the solutions containing .1 per cent. and .5 per cent. alcohol, and that in the solutions containing over 5 per cent. there was no further growth.

In the experiments tabulated on p. 476 aqueous solutions of strychnine nitrate (Merck's) containing the following amounts of the alkaloid to 50 c.c. of distilled water were used: $\frac{1}{30}$ grain, $\frac{1}{20}$ grain, $\frac{1}{15}$ grain, $\frac{1}{12}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain, $\frac{2}{5}$ grain, $\frac{3}{5}$ grain, $\frac{4}{5}$ grain, 1 grain.

It is interesting to note that in the above experiments the maximum growth of both the *Pisum sativum* and *Lupinus albus* occurred in the solution containing $\frac{1}{15}$ grain of the alkaloid, while those in solutions of weaker strength grew slightly less. The solution which proved toxic contained 1 grain of strychnine in 50 c.c. of distilled water.

In the second table on p. 476 the lengths of the roots at the end of the second twenty-four hours are given.

These experiments show that the seedlings growing in the $\frac{1}{15}$ -grain solution still grew more than those in solutions of $\frac{1}{30}$ and $\frac{1}{20}$ grain, and that in solutions containing between $\frac{1}{15}$ and 1 grain there was a gradual decrease in growth as the amount of strychnine was increased.

The table on p. 477 gives the results with solutions of brucine sulphate (Merck's) containing $\frac{1}{30}$ grain, $\frac{1}{20}$ grain, $\frac{1}{15}$ grain, $\frac{1}{12}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain, $\frac{2}{8}$ grain, $\frac{3}{8}$ grain, $\frac{4}{8}$ grain, 1 grain in 50 c.c. of distilled water.

Comparing the above experiments with those in which strychnine was employed, we notice that the growth of the seedlings in all cases was slightly more than that in the corresponding strengths of strychnine, and that death occurred in the solution containing $1\frac{1}{8}$ grain of the alkaloid, whereas with strychnine the toxic percentage was 1 grain in 50 c.c. of water.

The following experiments give the results at the end of the second twenty-four hours:

		BRUCINE SULPHATE.			
		PISUM SATIVUM.		LUPINUS ALBUS.	
Per Cent.	Actual Growth.	Remarks.	Actual Growth.	Remarks.	
$\frac{1}{30}$ gr. or '0022 gm.	{ 16.5 mm. 16. " }	} Apparently normal	{ 25.5 mm. 25. " }	} Apparently normal.	
$\frac{1}{20}$ gr. or '0032 gm.	{ 15.5 " " 15.5 " "	} " "	{ 24. " " 24.5 " "	} " "	
$\frac{1}{15}$ gr. or '0043 gm.	{ 17.5 " " 18. " "	} " "	{ 26. " " 26.5 " "	} " "	
$\frac{1}{12}$ gr. or '0054 gm.	{ 18. " " 18.5 " "	} " "	{ 27. " " 27. " "	} " "	
$\frac{1}{10}$ gr. or '0065 gm.	{ 10. " " 10. " "	} " "	{ 14. " " 14. " "	} " "	
$\frac{1}{8}$ gr. or '013 gm.	{ 8. " " 9. " "	} " "	{ 12. " " 12.5 " "	} " "	
$\frac{2}{8}$ gr. or '025 gm.	{ 6. " " 6. " "	} " "	{ 7. " " 7. " "	} " "	
$\frac{3}{8}$ gr. or '039 gm.	{ 3.5 " " 4. " "	} " "	{ 5. " " 5. " "	} " "	
$\frac{4}{8}$ gr. or '052 gm.	{ 3. " " 3. " "	} " "	{ 3.5 " " 3.5 " "	} " "	
1 gr. or '065 gm.	{ No growth	} Dead, flabby	{ 2.5 " " 3. " "	} " "	
$1\frac{1}{8}$ gr. or '078 gm.	{ —	} —	{ No growth	} Dead, flabby.	

In the above experiments, as in those of the first twenty-four hours, we notice an increase of growth over that in the corresponding strengths of strychnine.

A series of experiments upon alcoholic solutions of strychnine nitrate (Merck's) containing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain, $\frac{1}{5}$ grain of the alkaloid to 50 c.c. of the solution were carried out, with the following results :

STRYCHNINE NITRATE AND ETHYL ALCOHOL.

Strychnine nitrate . . 0.3 gm.
 Alcohol, 94 per cent. . 75 c.c.
 Water 25 c.c.
 Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 c.c. of sol. or 1 c.c. sol. H ₂ O q.s. 50 c.c.	5' mm.	} Apparently normal	9' mm.	} Apparently normal.
	5'5 "		9'5 "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	2'5 "	} " "	4' "	} " "
	2' "		4' "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2½ c.c. sol. H ₂ O q.s. 50 c.c.	1'5 "	} " "	3' "	} " "
	2' "		3' "	
$\frac{1}{5}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

STRYCHNINE NITRATE AND ETHYL ALCOHOL.

Strychnine nitrate . . 0.3 gm.
 Alcohol, 94 per cent. . 75 c.c.
 Water 25 c.c.
 Temperature (16°-21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 c.c. of sol. or 1 c.c. sol. H ₂ O q.s. 50 c.c.	6' mm.	} Apparently normal	14' mm.	} Apparently normal.
	6' "		15' "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	3' "	} " "	5' "	} " "
	3'5 "		5' "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2½ c.c. sol. H ₂ O q.s. 50 c.c.	2' "	} " "	4' "	} " "
	2'5 "		4' "	
$\frac{1}{5}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

In the above experiments, the maximum growth of the seedlings occurred in the solution containing $\frac{1}{20}$ grain alkaloid in 50 c.c. of the alcoholic solution, and death in the solution containing $\frac{1}{8}$ grain.

The succeeding table on p. 479 gives the results at the end of the second twenty-four hours.

In the second twenty-four hours we notice a corresponding increase in growth, as was noted in previous experiments.

BRUCINE SULPHATE AND ETHYL ALCOHOL.

Brucine sulphate . . . 0.3 gm.

Alcohol, 94 per cent. . . 75 c.c.

Water 25 c.c.

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 c.c. of sol. or 1 c.c. sol. H ₂ O q.s. 50 c.c.	6' mm.	} Apparently normal	10' mm.	} Apparently normal.
	6' "		10' "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	3.5' "	} " "	5.5' "	} " "
	4' "		6' "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2½ c.c. sol. H ₂ O q.s. 50 c.c.	2.5' "	} " "	4.5' "	} " "
	3' "		4.5' "	
$\frac{1}{4}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	} Dead, flabby	No growth	} Dead, flabby.

BRUCINE SULPHATE AND ETHYL ALCOHOL.

Brucine sulphate . . . 0.3 gm.

Alcohol, 94 per cent. . . 75 c.c.

Water 25 c.c.

Temperature (16°-21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 c.c. of sol. or 1 c.c. sol. H ₂ O q.s. 50 c.c.	7' mm.	} Apparently normal	16' mm.	} Apparently normal.
	7' "		16' "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	4.5' "	} " "	7' "	} " "
	4.5' "		7.5' "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2½ c.c. sol. H ₂ O q.s. 50 c.c.	4' "	} " "	6' "	} " "
	3.5' "		6.5' "	
$\frac{1}{4}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	} Dead, flabby	No growth	} Dead, flabby.

In the experiments in the first table on p. 480, alcoholic solutions of brucine sulphate containing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain and $\frac{1}{5}$ grain of the alkaloid to 50 c.c. of the solution were used.

In these experiments with brucine, alcohol and water, we again notice an increase in growth over the experiments with strychnine, thus tending to show that brucine is a less powerful alkaloid upon plants than strychnine.

The succeeding table gives the results of the experiments at the end of the second twenty-four hours.

In the second twenty-four hours the same conditions remain throughout the experiment; the maximum growth occurred in the solution containing $\frac{1}{20}$ grain and death in the $\frac{1}{5}$ grain solution.

In the following table are given the results with alcoholic solutions of strychnine nitrate and brucine sulphate, containing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain and $\frac{1}{5}$ grain of the alkaloids in equal proportion to 50 c.c. of the solution:

STRYCHNINE NITRATE, BRUCINE SULPHATE AND ETHYL ALCOHOL.

Strychnine nitrate . . . 0.15 gm.
 Brucine sulphate . . . 0.15 gm.
 Alcohol, 94 per cent. . . 75 c.c.
 Water 25 c.c.

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 c.c. of sol. or 1 c.c. sol. H ₂ O q.s. 50 c.c.	6 mm.	} Apparently normal	10 mm.	} Apparently normal.
	7 "		11.5 "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	3 "	} " "	5 "	} " "
	3 "		5.5 "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2½ c.c. sol. H ₂ O q.s. 50 c.c.	2 "	} " "	3.5 "	} " "
	2 "		3.5 "	
$\frac{1}{5}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	} Dead, flabby	No growth	} Dead, flabby.

Comparing the above experiments with those of strychnine and alcohol and brucine and alcohol, we observe an increase in the growth of the seedlings over that in strychnine and alcohol, and a slight decrease under that in brucine and alcohol.

The following table gives the results with strychnine, brucine and alcohol at the end of the second twenty-four hours :

STRYCHNINE NITRATE, BRUCINE SULPHATE AND ETHYL ALCOHOL.

Strychnine nitrate . . 0.15 gm.
Brucine sulphate . . . 0.15 gm.
Alcohol, 94 per cent. . 75 c.c.
Water 25 c.c.

Temperature (16°-21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 1 c.c. sol H ₂ O q.s. 50 c.c.	7 mm.	} Apparently normal	1.7 mm.	} Apparently normal.
	8 " "		1.8 " "	
$\frac{1}{10}$ gr. in 50 c.c. of sol. or 2 c.c. sol. H ₂ O q.s. 50 c.c.	4 " "	} " "	6 " "	} " "
	4 " "		6.5 " "	
$\frac{1}{8}$ gr. in 50 c.c. of sol. or 2 $\frac{1}{2}$ c.c. sol. H ₂ O q.s. 50 c.c.	3 " "	} " "	4.5 " "	} " "
	3 " "		4.5 " "	
$\frac{1}{2}$ gr. in 50 c.c. of sol. or 4 c.c. sol. H ₂ O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

TINCTURE OF NUX VOMICA (FREE FROM FAT).

Temperature (16°-21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H ₂ O q.s. 50 c.c.	4 mm.	} Apparently normal	9 mm.	} Apparently normal.
	4 " "		9.5 " "	
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H ₂ O q.s. 50 c.c.	3 " "	} " "	6 " "	} " "
	3 " "		7 " "	
$\frac{1}{20}$ gr. alkaloids in 50 c.c. or 1 c.c. tinct. H ₂ O q.s. 50 c.c.	2 " "	} " "	4 " "	} " "
	2.5 " "		4 " "	
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or 2 c.c. tinct. H ₂ O q.s. 50 c.c.	1.5 " "	} " "	2.5 " "	} " "
	1.5 " "		3 " "	
$\frac{1}{8}$ gr. alkaloids in 50 c.c. or 2 $\frac{1}{2}$ c.c. tinct. H ₂ O q.s. 50 c.c.	1 " "	} " "	2 " "	} " "
	1 " "		2 " "	
$\frac{1}{2}$ gr. alkaloids in 50 c.c. or 4 c.c. tinct. H ₂ O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

In the second twenty-four hours the same conditions are evident.

In the second table on p. 482 are given the detailed results with a tincture of nux vomica of U.S.P. strength (0.3 gramme of total alkaloids in 100 c.c. of tincture) from which the oil had been extracted. 13.332 grammes of the powdered drug, the amount used in making 100 c.c. of the U.S.P. tincture, contained .750 gramme of oil or 5.62 per cent.

In the foregoing, it is seen that no growth of the radicle occurred in the solution containing 4 c.c. of the tincture, and that between 4 c.c. and $\frac{1}{4}$ c.c. there was a gradual increase in length according as the strength of tincture in the solution was decreased.

In the following experiments are given the results at the end of the second twenty-four hours :

TINCTURE OF NUX VOMICA (FREE FROM FAT).

Temperature (16° - 21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{8}{10}$ gr. alkaloids in 50 c.c. or $\frac{1}{4}$ c.c. tinct. H_2O q.s. 50 c.c.	5' mm.	} Apparently normal	15' mm.	} Apparently normal.
	5' "		15'5 "	
$\frac{3}{10}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	3'5 "	} " "	6'5 "	} " "
	3'5 "		7'5 "	
$\frac{2}{10}$ gr. alkaloids in 50 c.c. or 1 c.c. tinct. H_2O q.s. 50 c.c.	3' "	} " "	5' "	} " "
	3' "		5' "	
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or 2 c.c. tinct. H_2O q.s. 50 c.c.	1'5 "	} No further growth	2'5 "	} No further growth.
	1'5 "		3' "	
$\frac{1}{8}$ gr. alkaloids in 50 c.c. or $2\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	1' "	} " " "	2' "	} " " "
	1' "		2' "	
$\frac{1}{2}$ gr. alkaloids in 50 c.c. or 4 c.c. tinct. H_2O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

The seedlings in the solutions containing $\frac{1}{4}$ c.c., $\frac{1}{2}$ c.c. and 1 c.c. of the tincture show a slight increase in growth during the second twenty-four hours, while those in solutions containing 2 c.c. and $2\frac{1}{2}$ c.c. show no further growth.

The following table gives the results with a tincture of nux vomica U.S.P. strength (0.3 gramme of total alkaloids in 100 c.c. of tincture) from which the fat has not been extracted :

TINCTURE OF NUX VOMICA, U.S.P.

Temperature (16° - 21° C.).

First 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{80}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	5' mm.	} Apparently normal	10' mm.	} Apparently normal.
	5' "			
$\frac{1}{40}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	4' "	} " "	8'5' "	} " "
	4' "			
$\frac{1}{20}$ gr. alkaloids in 50 c.c. or 1 c.c. tinct. H_2O q.s. 50 c.c.	3' "	} " "	5' "	} " "
	3' "			
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or 2 c.c. tinct. H_2O q.s. 50 c.c.	2' "	} " "	3' "	} " "
	2' "			
$\frac{1}{5}$ gr. alkaloids in 50 c.c. or $2\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	1'5' "	} " "	2' "	} " "
	1' "			
$\frac{1}{2}$ gr. alkaloids in 50 c.c. or 4 c.c. tinct. H_2O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

Comparing the above results with those of tincture of nux vomica free from fat, it will be seen that there is a slight increase in the growth.

TINCTURE OF NUX VOMICA, U.S.P.

Temperature (16° - 21° C.).

Second 24 Hours.

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{80}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	6' mm.	} Apparently normal	16' mm.	} Apparently normal.
	6' "			
$\frac{1}{40}$ gr. alkaloids in 50 c.c. or $\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	4'5' "	} " "	9'5' "	} " "
	5' "			
$\frac{1}{20}$ gr. alkaloids in 50 c.c. or 1 c.c. tinct. H_2O q.s. 50 c.c.	3'5' "	} " "	6' "	} " "
	3'5' "			
$\frac{1}{10}$ gr. alkaloids in 50 c.c. or 2 c.c. tinct. H_2O q.s. 50 c.c.	2' "	} No further growth	3' "	} No further growth.
	2' "			
$\frac{1}{5}$ gr. alkaloids in 50 c.c. or $2\frac{1}{2}$ c.c. tinct. H_2O q.s. 50 c.c.	1'5' "	} " " "	2' "	} " " "
	1' "			
$\frac{1}{2}$ gr. alkaloids in 50 c.c. or 4 c.c. tinct. H_2O q.s. 50 c.c.	No growth	Dead, flabby	No growth	Dead, flabby.

The succeeding table gives the results with tincture of nux vomica (fat) at the end of the second twenty-four hours.

In these experiments we still notice an increase in the growth of the radicle over that of tincture of nux vomica free from fat.

CONCLUSION.

At the present time, when the assaying of drugs is of so much importance to the physician and also to the pharmacist, it is needless to say that any methods which will enable us to arrive at results which can be used directly or calculated so as indirectly to be of value to the professions are of considerable importance. The question arises, how can the figures obtained be translated so as to be of practical value. From the results obtained we may say generally that the rate of growth of the radicles in the solutions containing toxic principles is inversely proportional to the toxicity of the solution.

The results of the foregoing experiments tend to show that there is a definite solution of alcohol or nux vomica alkaloids that is toxic, and that with solutions containing different amounts of alcohol or nux vomica alkaloids there is a definite measure of growth depending upon the quantity contained therein. Inasmuch as this is to be taken as a measure of the amount of alcohol or alkaloids affecting the plants experimented upon, it is seen that we have here a direct means of measuring the quantity of alcohol or alkaloids in the respective solutions.

RECOLLECTIONS AND REMINISCENCES OF PROF. WM. PROCTER, JR.

In response to a letter from the editor of this JOURNAL, the following letters containing some recollections and reminiscences of Professor Procter have been received :

“DEAR SIR:—I became personally acquainted with Professor Procter in 1868, and subsequently have met him occasionally in Philadelphia, in New York and at the annual meetings of the American Pharmaceutical Association. When in Philadelphia I called upon him, and he upon me when in New York. Being of a retiring disposition, Professor Procter was at first reticent with strangers, but a genial and sympathetic companion and friend when better acquainted.

He was always eager to learn, and enjoyed reminiscences of his European trip in 1867, frequently expressing his regret how much he believed to have missed while in Germany on account of being insufficiently familiar with the German language.

“Percolation was then in its infancy, and he rejoiced in having an opportunity at one of my visits of showing and demonstrating to me in the laboratory adjoining his drug store the process and the various percolators then used by him. At several of his calls at my home he much enjoyed my collection of microscopical slides of plant drugs. He was not used to microscopic technique, and expressed his regret of not having had in younger years the opportunity of becoming familiar with the use of the microscope, whose importance for application in pharmacy he promptly recognized. He was particularly delighted on being shown the beautiful color reaction in freshly cut slides by the action of iodine solution upon the otherwise hardly visible starch granules in vegetable cellular tissue.

“Being closely engaged in attending to my drug business and to microscopical and analytical work imposed upon me by medical practitioners, it was chiefly on Professor Procter’s solicitation that I undertook in 1869 to prepare the annual report on the progress of pharmacy for the American Pharmaceutical Association. He subsequently made, jointly with Professor Maisch and Dr. Ed. R. Squibb, strong efforts for inducing me to henceforth continue in this work, but finally approved of my argument for declining, as I then deemed it the greater service I could perform for American pharmacy and the Association by elaborating and offering them a compend on the examination of medicinal chemicals, until then wanting in American pharmaceutical literature.

“Professor Procter used to quite regularly, and always in company with his close friend, Dr. Edw. R. Squibb, attend the annual meetings of the American Pharmaceutical Association, and greatly enjoyed in meeting there old and new friends. They both stood foremost in upholding the ethical standard of the Association and of American pharmacy, and proved at various opportunities uncompromising adversaries of sophistry and empiricism.

“I saw his genial features for the last time when attending his funeral as a delegate of the New York College of Pharmacy on February 14, 1874. At the occasion of a lecture on the application

of the microscope in pharmacy, delivered before the same college on February 12th, it was my sad duty to pay this brief tribute of reverence to the memory of the departed friend :

“ ‘ Before commencing the lecture of this evening, I wish to express, in a few words, the profound emotion and grief which the sudden death of our distinguished friend, Prof. William Procter, Jr., has caused among our profession. What Procter has accomplished we all know ; what a good and noble man he was, those know best who knew him personally. American pharmacy has been elevated by his guiding hand, and has been largely advanced by his toil and genius. He has been its pilot to purer and higher aims, one of its truest and greatest representatives.’ (*Druggists’ Circular and Chemical Gazette*, March, 1874, p. 57.)

“ Yours truly,

“ FRED. HOFFMANN.”

“ DEAR SIR :—My first recollections of Professor Procter were when he used to come into the store of Charles Ellis & Co., 56 Chestnut Street, where I was an apprentice. He generally had a package under his arm, and walked with a firm, quick step back to the office, nodding pleasantly to us boys.

“ Next was his lectures at the College of Pharmacy, on Zane Street above Seventh, preceded by a quiz of those who wished to take it seated in the front rows of benches. He was kind enough to help out the doubtful students by judicious questioning. The lecture itself was always delivered in a clear and distinct manner, well illustrated by specimens and preparations and commanded the respectful attention of the class.

“ In those days the examinations for graduation were verbal, and the anxious young man appeared before the Professor and two or more of the Examining Committee of the Board of Trustees, and submitted to the cross-questioning and identification of specimens. Professor Procter was not terrifying, but always kind in manner, endeavoring to put the youth at his ease and get out of him all he knew on the subject.

“ At the pharmaceutical meetings, then well attended by Procter, Bridges, the Parrishes, Maisch and many of the younger lights in pharmacy, he was a frequent contributor of very practical papers that were valuable to the apothecary in his every-day business.

“When the trustees were endeavoring to raise funds to pay for the lot on Tenth Street and put up a college building to replace the old one that was too small for the increasing number of students, it was my privilege to canvass with him a section of the city allotted to us. We spent many mornings together interviewing almost every retail druggist in our district, and his presence very largely influenced the cash response to our request, he backing up my remarks with a few judicious words.

“In all our intercourse when on the Board of Trustees together, and as members of the American Pharmaceutical Association, when we attended many meetings together, Professor Procter was the same genial, considerate and cordial friend to the younger members of the profession and to all with whom he came in contact. We had worked together on the revision of the Pharmacopœia of 1860, and, when attending my first meeting of the American Association in New York, he nominated me as Secretary to the august assembly, much to my horror.

“All his old students, many of whom became his fast friends after graduation, will bear me out in the opinion that the ‘Father of American Pharmacy’ was a most fatherly instructor, unselfish advisor and that rarest of rare beings, a true friend.

“JAMES T. SHINN.”

“DEAR SIR:—It is nearly forty-four years since I sat under the teaching of Prof. William Procter. I can hardly say that my acquaintance with the Professor began upon my entering the class, for I had received much instruction from the reading and studying of the ‘Practice of Pharmacy,’ by Mohr, Redwood and Procter, a copy of which had fallen into my hands some two or three years before my entrance into the College.

“I was quite a young man, from what was then considered the West, and there were very few whose homes were farther west than mine.

“Professor Procter was then in his prime, and his lectures were very instructive—a plain statement of facts and rarely embellished with the flashes of wit that were frequent with Professor Thomas, the lecturer upon materia medica. Professor Procter was dark-complexioned and at that time his hair was the color of the raven’s wing.

“I remember one topic upon which he laid especial stress, viz.,

percolation. This process was then in its infancy in this country, and I doubt if any of those who heard him have ever entirely forgotten the directions given. And while pages have been written since upon the subject, there has not been much added to what Professor Procter gave in his lecture.

“ His lecture upon the pharmacy of the cinchonas was both interesting and instructive ; the same may be said regarding his lecture upon the pharmacy of opium, for be it remembered that at that time really good drugs were very difficult to obtain even in a crude form. And as to powders, the bulk of them were simply horrid. It was this fact that led Procter, Ellis, Parrish and others in Philadelphia to associate themselves with some kindred spirits in New York, Boston and Baltimore, to hold a meeting and organize the American Pharmaceutical Association, which has grown into a power of strength in the world of pharmacy.

“ From what I knew of Professor Procter I can readily see him, the leading spirit in the first meeting of this body. I have often thought what would the dear old man think or say could he step into a modern drug store and see the array of ready-made preparations, and peruse a modern prescription file, and see 90 per cent. of the prescriptions calling for some specialty, in whole or in part. He would feel sad, to say the least.

“ He was a grand man and there is no one to divide the honor ; he was the ‘ Father of American Pharmacy ’ indeed.

“ GEO. W. SLOAN.”

RECENT LITERATURE RELATING TO PHARMACY.

THE ASH OF CINNAMON BARK.

Finding that much of the cinnamon of German commerce (especially that in broken pieces) failed to meet the pharmacopœial requirements as to ash (not more than 5 per cent. of ash with 1 per cent. of sand), G. Rupp (*Süddtsch. Ap. Zt.*, 1899, 267) reports the examination of two packages imported to order.

A package from China was a ball weighing 12 kilos, containing thick fragments of the bark of older branches, the more brittle parts of young shoots and considerable pebbles, sand and dirt. The second package, closely resembling the other, came from Ceylon.

The Chinese bark, ground with its mineral impurities, gave 5.79 per cent. ash with 2.83 per cent. sand; and when freed from pebbles and grit, showed 4.83 per cent. ash with 0.83 per cent. sand. Commercial powder, said to be from same source, showed 6.03 per cent. ash with 3.1 per cent. sand. Commercial Ceylon cinnamon powder showed 6.1 per cent. ash with 2.4 per cent. sand, while the contents of the original package showed 4.92 per cent. ash with 1.06 per cent. sand, when ground with the adhering grit; and 4.4 per cent. ash with 0.6 per cent. sand, when cleaned.

The article closes with remarks of Dr. A. Rau on the difficulty of securing pure cinnamon by reason of practical monopoly possessed by the Chinese. He concludes that the only feasible method of preventing inferior ware from reaching the market is by exclusion, at the custom-house, of all samples below pharmacopœial requirements.

H. V. ARNY.

WINE OF CINCHONA.

A careful study of cinchona wine is reported by G. Weinedel (*Ph. Zt.*, 1899, 285). He finds fault with the recipes of the two German pharmacopœias; both products soon depositing a sediment, containing considerable amount of the alkaloids. For instance, one specimen of wine containing, when fresh, 1.82 per cent. alkaloids, after four weeks contained 1.36 per cent., and after sixteen weeks contained 0.48 per cent.

After trying all recipes coming under his notice, he devised the following process, which, he claims, is most satisfactory:

Cinchona, in coarse powder 500 Grammes.

Macerate on water-bath for twenty-four hours with a mixture of:

Hydrochloric acid 30 Grammes.

Water 750 "

Then transfer to a wide-mouthed container and macerate for eight days with:

Alcohol 1,000 Grammes.

Then add:

Sherry wine 10,000 Grammes.

(Or, better, sherry and malaga, each 5,000.)

Syrup 1,500 "

Syrup of orange 200 "

Citric acid 10 "

Macerate four weeks in cellar and there filter.

H. V. A.

SANDALWOOD OIL.

A German house has put on the market a purified product of sandalwood oil, from which, it is claimed, the deleterious constituents of the native oil have been removed.

Their chemists, von Soden and Mueller (*Ph. Zt.*, 1899, 258), report on their product, which they claim is a mixture of, at least, two closely similar sesquiterpene alcohols, of the formula $C_{15}H_{25}OH$, basing their opinion on the fact that different distillation fractions show differing polarization intensity. A separation of the constituents has not yet been accomplished.

In the rejected portion of the oil, the writers find a new sesquiterpene, $C_{15}H_{24}$, which they call santalene.

It is laevogyre, boils at 261° – 262° , and has specific gravity 0.898 at 15° . It adds two molecules of hydrochloric or hydrobromic acids or of bromine, the products being not yet obtained in crystalline form. Hydration of the product by method employed by Wallach and Walker with caryophyllene yielded an alcohol, $C_{15}H_{25}OH$, boiling at 160° – 165° under 7 millimetres pressure, and differing from the alcohols found in their specialty.

The writers also found in the oil a phenol of unpleasant odor, a lactone, an acid melting at 154° and some borneol.

H. V. A.

ASSAY OF FRANGULA.

In a contribution from the Helfenberger factory (*Ph. Cent.*, 1899, 277), Dr. K. Dieterich discusses Aweng's investigation of frangula (see A. J. P., 1899, 398), the writer assaying the drug, by estimation of its two glucosides by successive treatment with acetone and 60 per cent. alcohol, in an endeavor to decide if the heat of 100° necessary to destroy the griping ferment, lessened the quantity of the two valuable glucosides. Examination of fresh bark and the same heated to 100° for forty-eight hours showed approximately the same amount of glucoside—16.79 per cent. of the acetone soluble glucoside and 17.18 per cent. of the other against 16.16 per cent. and 17.64 per cent. in heated bark—the amount in both being estimated on water-free bark.

From this result, the writer makes the important suggestion that the ageing process now directed (keeping one year) can be replaced by heating to 100° for forty-eight hours.

H. V. A.

CONCERNING SOLANIN.

Noting diversity of reports on solanin, relating alike to composition and properties, Cazeneuve and Bretem (*Jour. de Pharm. et Chim.*, 1899, 465) took up the work again.

They obtained the body from fresh sprouts of potato—not longer than 10 centimetres—by mixing these with their own weight of lime, drying at ordinary temperature and extracting with 93 per cent. alcohol. The alcoholic liquid, which was only slightly yellow, was evaporated in vacuo, to a syrup, which crystallized on cooling. The crystals were washed with ligroin and ether and further purified by crystallization from alcohol.

The yield was 0.5 gramme of glucoside from a kilo of sprouts. It melted at 250° (against 240° of Zwenger and Kind and of Kletzinski; 235° of Hilger, and 244° of Firbas). The crystals contained 5.52 per cent. water, and analysis leads the writers to propose as formula $C_{23}H_{47}NO_{10} \cdot 2H_2O$ (against $C_{43}H_{71}NO_6$ of Zwenger and Kind; $C_{21}H_{35}NO_7$ of Kletzinski; $C_{42}H_{87}NO_{15}$ of Hilger and $C_{52}H_{93}NO_{18}$ of Firbas).

The writers find that it hydrolyzes to a crystalline product melting at 190°, soluble in ether (in which solanin is insoluble), and to a reducing sugar yielding a di-hydrazone. The rest of the article is devoted to correction of tests of identity.

H. V. A.

A CONSTITUENT OF XYLEM.

Well known is the reaction in which xylem, and hence all wood products—is colored red by phloroglucin and hydrochloric acid. Czapek (*D. Am. Ap. Zt.*, through *Süddtsch. Ap. Zt.*, 1899, 326) reports successful extraction of the principle producing the color. He takes finely powdered wood, which has been cooked in alcohol, and heats it to 80° to 100° with six times its weight of 15 per cent. solution of tin chloride. The solution is then evaporated, the residue is cooked with benzol, which dissolves the principle, the benzol solution is evaporated and the residue is dissolved in alcohol. The alcoholic solution is freed from admixtures by precipitation with water, and from the weak alcoholic mixture the pure product is obtained by extraction with ether and crystallization from alcohol.

The body has the following color reactions: with sulphuric acid, red-violet; with anilin and thallin sulphates, bright yellow; with

phloroglucin and hydrochloric acid, cherry red to violet ; with hydrochloric acid and naphthol, blue-green ; with hydrochloric acid and phenol, green. Further investigation is yet to be made, but these preliminaries are enough to disprove the former idea that the xylem reaction was due to vanillin or coniferin. The writer names his product hadromin.

H. V. A.

OXIDATION IN EXTRACTS.

The changes in constituents of vegetable extracts are discussed by Dr. Stich (*Ph. Zt.*, 1899, 871). His work was confined to ergot extracts and derivatives, and he found that Kellar's violet ergot reaction is given only by fresh preparations, and not from most commercial extracts, nor from cornutin and ergotinin.

Thinking these negative results were due to oxidation, the writer reduced the several preparations with sodium amalgam, whereupon Kellar's reaction gave striking results. To confirm his theory, he treated those preparations, originally giving Kellar's reaction, with hydrogen peroxide, after which the reaction was not obtained.

The oxidation being proved, the writer attributes it to oxidizing enzymes.

H. V. A.

"NEW" METHOD OF PREPARING TINCTURES.

An amusing instance of how little the self-sufficient German knows of pharmaceutical progress on this side of the ocean is seen in an article by A. Schneider (*Ph. Cent.*, through *Ph. Zt.*, 1900, 36). In this, the writer sagely states that pure alcohol or even diluted alcohol is not the proper menstruum for all tinctures and extracts ; that ammonia water should be added to the menstruum of glycyrrhiza preparations ; glycerin for tannin-bearing drugs, and above all—great novelty—acids for alkaloidal drugs. The only trace of originality shown in the paper is in the suggestion that the acids could be removed from the finished preparation by appropriate precipitants—a method likely to endanger quality of product.

H. V. A.

ANTIDOTE FOR FORMOL.

M. André (*J. Pharm. et de Chim.*, through *Schweiz. Wochenschr.*, 1899, 456) reports an accident in which a woman took a teaspoonful of 40 per cent. formaldehyde solution, producing severe caustic effect. As the theoretical antidote was ammonia (the reaction

being $6\text{CH}_2\text{O} + 4\text{NH}_3 = 6\text{H}_2\text{O} + \text{C}_6\text{H}_{12}\text{NH}$; the harmless hexamethylenamine being formed), solution of ammonium acetate was administered with the happiest results. About three volumes of spirit of mildererus should be used to counteract one volume of 40 per cent. formaldehyde, and an alkaline mineral water should be given to neutralize the acetic acid liberated in the reaction.

H. V. A.

ANTIDOTES FOR CYANOGEN COMPOUNDS.

The researches of Dr. Meurice, on the use of salts of the heavier metals as antidotes for cyanogen compounds, are reported by M. Heymann (*Bull. Acad. Med. Belg.*, 1899, 564). The poisons employed were potassium cyanide, acetonitrile, lactonitrile, benzonitrile, amygdalonitrile and the nitrile of malonic acid. The antidotes were the nitrate of cobalt and nickel and the sulphates of copper and iron. The subjects were rabbits, pigeons and frogs with the first-named antidote, and rabbits only with the others. The conclusions are: that the action of all nitriles, save benzonitrile, is combated by salts of the heavy metals; that cobalt nitrate is the best antidote, counteracting four times the lethal dose of amygdalonitrile; that the antidotal action of the other salts mentioned above lessen in the order there given. The last conclusion is that the antidotal effect is not entirely due to chemical reaction, since those cyanogen compounds giving the least copious precipitates with the antidotal salts are most strongly counteracted by them. H. V. A.

IODOFORM TEST.

On theoretical grounds, M. G. Denigès (*Bull. Soc. Pharm. Bordeaux*, 1899, 321) devised a test for minute quantities of iodoform, based on formation of fuchsin dyes, when iodoform is treated with aromatic amines. He extracts the iodoform from its mixtures with ether and, after evaporating solvent, he adds three or four drops dimethylanilin, whereupon the liquid becomes a deep brown, and, on warming almost to boiling and adding a little alcohol, the product assumes a violet or red tint, according to amount of iodoform present. The absorption spectrum of the liquid shows the characteristic methyl-violet band, and with a hand spectroscope 0.1 milligramme iodoform can be readily detected. If the iodoform is mixed with a substance soluble in ether like guaiacol, the violet

coloration is hardly discernible, but the spectrum shows the characteristic band.

In conclusion, the writer suggests the method as a colorimetric assay, based on brown color, formed in cold mixture of iodoform and dimethylanilin.
H. V. A.

ANALYSIS OF VOLATILE OILS.

A fact noted by M. Duyk (Mem. Acad. Med. Brux., through *Bull. Soc. Pharm. Brux.*, 1899, 350) is likely to prove of value in analysis of volatile oils. He notes that when volatile oils are shaken with a fairly concentrated solution of sodium salicylate, the oxygenated products, such as eucalyptol, geraniol, carvone and citral, are dissolved, while the hydrocarbons separate, thus affording a simple method of separating these two classes of volatile oil constituents. It moreover affords means of detection of terpenes in such commercial products as carvone and eucalyptol.
H. V. A.

THE CHEMISTRY OF THE RESINS.

Professor Tschirch gave an interesting address on resins at the last "Naturforscher" convention (*Schweiz. Wochenschr. für Pharm. und Chem.*, 1899, 470). From coniferous resins he separates the characteristic acids by fractional extraction of ethereal solution with dilute ammonium carbonate solution and 0.1 per cent. soda solution and subsequent precipitation of the acids by hydrochloric acid. All the resins yield several acids, mostly crystalline, and different, not only when from different plants, but also according to varying manipulation in manufacture. Thus, the naturally exuding resins, the resins exuding through artificial wounds, and resins prepared by cooking (like colophony) yield a different variety of acid.

Similar to the coniferous resin acids are those yielded by the resins of the natural order Leguminosæ. Of these, the acids from Zanzibar copal and of copaiba have been investigated by the author. Those from the last-named drug were its ethereal solution, with 5 per cent. soda solution precipitated by hydrochloric acid, redissolved in ether and fractionated by successive agitation with dilute ammonium carbonate solution and 5 per cent. soda solution. In this way, five acids were obtained and their chemistry is still being studied by the author.
H. V. A.

PHYSOSTERIN IN ANIMAL FATS.

Of late years chemical research has shown that the best test for the presence of cotton seed oil residues in animal fats (like lard) is the isolation and identification of the physosterin crystals found in the cotton seed. It is true that animal fats contain the closely similar cholesterin crystals, but the two can be easily distinguished by a careful observer.

C. Virchow (*Ber. Dtsch. Pharm. Ges.*, 1899, 193) points out the following distinctions: (1) shape of crystals as seen under the microscope; (2) melting points (cholesterin, 144° – 145° ; physosterin, 136° – 137°). In other respects the two substances are similar, both being soluble in the same extraction liquids and showing identical color reactions.

Of the latter, the most striking is the author's modification of the Lieberman cholesterin reaction, which is as follows:

Dissolve substance in smallest quantity of chloroform in a narrow tube, add acetic acid anhydride and shake. Then pour the solution cautiously on a layer of sulphuric acid, when the point of contact colors successively red-violet, blue-violet, indigo, blue-green, green and brown.

The article concludes with a report on examination of the fat of animals whose fatty diet was cotton seed oil only. Despite the fact that the above oil contains physosterin, the fat of the slaughtered animals never showed its presence.

H. V. A.

CELLULOSE.

A new contribution to the chemistry of cellulose is an article by Bumcke and Wolffenstein (*Ber. Dtsch. Chem. Ges.*, through *Ph. Cent.*, 1899, 690), who report that oxy-cellulose and hydro-cellulose, instead of being oxidation products, originate through hydrolysis. Treating cellulose with hydrogen peroxide, the authors obtained an oxy-cellulose, evidently formed by the same method of decomposition of the hydrogen peroxide as we see when that oxidizer acts on cane sugar, namely, $H_2O_2 = H_2O + O$, the formed water acting in a nascent state. They call this oxy-cellulose, hydral-cellulose, and find it to be an aldehyde, changing to the alcohol (cellulose) or to the acid (acid-cellulose) under appropriate reagents. Acid-cellulose differs from cellulose by its solubility in cold solution

of soda and from hydal-cellulose by absence of aldehyde properties. It can be formed direct from cellulose by treatment of the latter with Schweitzer's reagent.

The writers then compared the three substances by attempted incorporation of the nitro-group, and they all formed the same nitro-cellulose, which analysis showed to be nitro-hydro-cellulose. Molecular weight estimations pointed to $6C_6H_{10}O_5 + H_2O$ as the formula of hydal-cellulose, while cellulose is $(C_6H_{10}O_5)_{12}$.

To this information von Faber and Tollens (*Ber. Dtsch. Chem. Ges.*, 1899, 2589) add that the above-mentioned oxy-cellulose consists of a combination of cellulose with a derivative, which the investigators call celloxin. This has not been isolated, but its decomposition into iso-saccharic and dioxy-butyric acids, when oxy-cellulose is cooked with water (the cellulose portion remaining unchanged), seems to point to the formula $C_6H_{10}O_6$ or $C_6H_8O_6$. H. V. A.

CHEMICAL IDENTIFICATION OF COTTON FIBRE.

A simple test for cotton based on the conversion of its cellulose into an aldehyde carbohydrate and subsequent application of an aldehyde color test has been devised by E. Jandrier (*Ann. Chim. Analyt.*, through *Schw. Wochenschr. für Pharm. und Chem.*, 1899, 489).

It consists in heating 1 gramme of the suspected fabric (after careful washing!) with sulphuric acid, specific gravity, 1.161, on a water-bath for a half hour, diluting to 1 litre; mixing about 2 c.c. of this solution with 0.01 gramme resorcin and pouring into concentrated sulphuric acid, so as to form a separate layer.

At the point of contact an orange ring is formed if cotton is present. Other phenols show similar reaction, the tint being different, however. The reaction shows even when the fabric is colored. H. V. A.

AUTUMNAL CHANGE OF LEAF CONSTITUENTS.

It has been noticed that the leaves of trees have less potassium, phosphoric acid and nitrogen and more silicic acid and lime in the fall than in the early summer, and, concerning the cause, there have been different theories; the last being that the autumnal rains wash the soluble salts out of the leaves. The latest investigators, Tollens and Jucker (*Ber. Dtsch. Chem. Ges.*, through *Pharm. Zt.*,

1899, 814), working on the leaves of *Plantanus occidentalis*, collected from June to November, confirm the original statements as to loss of soluble constituents, but show that the loss is practically identical, whether leaves were protected from rain or not. The investigators, therefore, return to the theory that the soluble salts in the leaves move to the cells of the branches and trunk before the leaves fall.

H. V. A.

A NEW ALKALOIDAL REAGENT.

Mecke (*Ztsch. oeffent. Chem.*, through *Suddtsch. Ap. Zeit.*, 1899, 739) recommends a 5 per cent. solution of selenous acid in concentrated sulphuric acid, as giving particularly striking color reactions with the opium alkaloids; yielding, for instance, a distinct green, with 0.005 milligramme morphine or codeine; orange, with 0.002 milligramme thebaine; blue, with 0.1 milligramme papaverine, and blue-violet, with 0.02 milligramme apomorphine.

It is of great value in testing opium galenicals or food remnants for morphine, since in such cases the brown color produced by the concentrated acid does not cover the green tint.

H. V. A.

ELECTROCHEMICAL ACTION OF ROOTS.

The important role played by electrochemistry in all cell functions is emphasized by the researches of R. Kohn (Land. Vers. Station, through *Ph. Zt.*, 1899, 814) on the causes of the acid action of root hairs, a phenomenon noted long since. The writer shows, by pieces of litmus placed at various distances around beet roots, that acid is not emitted by the roots, but that they act as positive electrodes, attracting the acid constituents of the soil and repelling the alkaline ions.

H. V. A.

REVISION OF THE GERMAN PHARMACOPŒIA.

In view of the recent pharmacopœial convention in Washington, the report of the German Commission (*Ap. Zt.*, 1899, 679) as to additions to their pharmacopœia is of interest.

They recommend the addition of twenty-five remedies to their present list of officials, namely: *Adeps Lanæ Anhydricus*, *Adeps Lanæ cum Aqua*, *Æther pro Narcosi*, *Alcohol Absolutus*, *Arecolinum Hydrobromicum* (the alkaloid of *Areca* nut), *Baryum Chloratum*, *Bismuthum Subgallicum*, *Bromoformium*, *Coffeinum*

Natrio-salicylicum, Gelatina Alba, Hydrargyrum Salicylicum, Hydrastininum Hydrochloricum, Mel, Methyl-Sulfonalum, Oleum Camphoratum Forte, Oleum Chloroformi, Oleum Santali, Pilulæ Ferri Carbonici Blaudii, Pyrazolonum Phenyl-dimethylicum Salicylicum (antipyrin salicylate), Semen Erucae (white mustard seed), Serum Antidiphthericum, Tela Depurata (purified gauze), Tuberculinum Kochi, Unguentum Adepis Lanæ, Vinum Chinæ.

It will be noticed that the two most popular serums are to be admitted, and this step is of great value in the case of the diphtheria serum in attempting uniformity of valuation; four strengths, (0 to III) ranging from 200 to 1,500 "immunization units," being permitted.

The commission recommends a change in description of pomegranate bark (including assay) and changes the formula of sticking plaster by incorporating India rubber. H. V. A.

ARE BACTERIA FUNGI?

In *Centralblatt f. Bakteriologie*, etc., Zweite Abt., Bd. iii, Nos. 11 and 12, Dr. Johan-Olsen argues that bacteria are simply one stage in the development of fungi, and supports his text, *Zur Pleomorphismusfrage*, with two well-drawn plates. Unfortunately, some of his most striking examples are drawn from species of Oospora which mycologists for many years have classed as fungi, and whose only claim to be classified as bacteria is the fact that when their extremely tenuous hyphæ break up into conidia, or oidia, the latter closely resemble rod-shaped bacteria in size and form. These conidia, however, grow into genuine branched mycelia. Some of the other cases which he cites, *e. g.*, branched tubercle and diphtheria bacilli, may well be involution forms, as Dr. Migula has suggested, since they are usually found only in old cultures, sparingly, and under conditions unfavorable to the organism. More difficult to explain is his account of the change of the mycelium of *Dematium casei* into bacteria bearing endospores, the germination of which spores he succeeded in witnessing. Possibly Dr. Ol. Johan-Olsen was working with mixed cultures. Much is said of Dr. Brefeld's *System*, but if Dr. Johan-Olsen's culture methods are not a very decided improvement on those of his master, which have been described to me in recent years by a number of people who have studied at Munster, and which are certainly very crude, then we

are fully warranted in calling in question the results. One is the more inclined to do this because in another paragraph we are told that: "Almost all bacteria which I have had in cultivation in recent years form a branched mycelium in course of time, especially all bacilli." We are also rendered suspicious by the statement that species of *Aspergillus* and *Mucor* may appear in the form of amœba. It is possible, of course, that bacteria are only "incompletely known fungi," but up to this time the evidence is certainly not very conclusive, and to the writer it seems not at all improbable that they may have had quite a different origin, at least many of them.—Erwin F. Smith, in *The American Naturalist*, Vol. XXXIII, p. 169.

POISONOUS GRAINS.

It has long been believed that the fruit of *Lolium temulentum* is poisonous, and chemists have had something to say about its toxic principles. In the *Journal de Botanique* for August M. Guérin publishes an article embodying the results of a study made at the École Supérieure de Pharmacie of Paris, in which he records the constant occurrence of fungal hyphæ in the nucellus of the ovule and the layer of the caryopsis lying between the aleurone layer and the hyaline portion of the wall. These hyphæ, which appear not to have been identified with any fruiting form, are referred to as, perhaps, the cause of the toxicity of the Loliums in which they occur (*L. temulentum*, *L. arvense* and *L. linicola*), and they are stated not to have been found in *L. italicum*, and only once in *L. pœrenne*. The fungus is compared with *Endoconidium temulentum*, Pril. and Delacr., found in diseased grain of the rye, and believed to be the cause of some of the cases of poisoning attributed to that grain, though it is believed to differ from the fungus named, and the conclusion is reached that, unlike this species and *Claviceps*, it lives in the maturing grain symbiotically rather than as a parasite.—Abstract in *ibid*, p. 171.

THE CHEMISTRY OF STROPHANTHUS.

The only strophanthus preparation included in official pharmacopœias is the tincture prepared from the seed of *Strophanthus kombé*, Oliv., according to some pharmacopœias, or from the seed of *S. hispidus*, D. C., according to others, and it is stated that the residue of the evaporated tincture gives with sulphuric acid a green coloration.

Great hopes of this remedy were for some time entertained, because it did not produce the disagreeable effects of digitalis, but it has fallen into discredit, since the tincture met with in commerce proved to be of very unequal activity.

The causes of this objection are now clearly recognizable, and they explain the disinclination of medical men to use the drug. The essential point is the use of a pure glucoside of known activity, and my object is to direct attention to strophanthin as the substance which, on account of its great solubility in water as compared with the glucosides of digitalis, is more readily absorbed, and is, therefore, more prompt in its action.

Description Given.	STROPHANTHIN.			PSEUDO-STROPHANTHIN.		
	Fraser, Hisp. var. Kombé.	Böhringer, Kombé.	Schuchardt, Hispidus.	Arnaud, Kombé, or Hispidus.	Kohn, Kulisch, Hispidus or Kombé?	Merck (Kohn), Hisp.
Color of seed used . . .	Greenish-white	Pale green	?	Green	Green	Brown
Seed with H ₂ SO ₄ . . .	?	Green	?	?	Green	?
Glucoside with H ₂ SO ₄	Green	Green	Red	?	Red	Red
Formula	—	C ₄₀ H ₆₆ O ₁₉	—	C ₃₈ H ₅₈ O ₁₅ =	(C ₄₀ H ₆₀ O ₁₆)	—
Melting point	172°-75°	170°	167°	165° about	179°	179°
Optical rotation . . .	—	{ 1 p. c. solution none 5 p. c. = + 10° }	—	[a] _D = +3c°	{ Mini- mal left }	—
Hydrolysis, with . . .	{ 1 p. c. HCl at 50°-60° }	{ 0.5 p. c. HCl at 70°-75° }	{ 0.5 p. c. HCl at 70°-75° }	—	{ 2.4 p. c. HCl at 100° }	—
Yield of strophanthin or ψ-stroph.	{ 0.3 p. c. H ₂ SO ₄ 65°-70° 33.7 }	— 50-52	—	—	— 52.5	—
Melting point	—	169°-170°	—	—	195°	195°
Formula	—	C ₂₇ H ₃₈ O ₇	—	—	{ C ₂₈ H ₄₀ O ₆ or C ₁₉ H ₂₈ O ₄ }	—
Lethal dose per kilogram rabbit, subcutaneous injection	—	0.0066	0.0006	0.00025	—	0.003

Among the circumstances which have to be considered as influencing the medicinal value of the tincture, the uncertainty as to the source of the seed used is a considerable one, as has been shown by many observers. Still more important than the circumstance that while some seeds contain strophanthin others do not, is the exist-

ence of different strophanthus glucosides ; the one isolated by Fraser differs from that isolated by Arnaud, the two substances differing chemically and in toxic power.

Strophanthin was obtained by Fraser from the green seed of *S. kombé*, but whether it exists in other kinds is still undetermined. The other glucoside obtained by Arnaud subsequently investigated by Kohn and Kulisch, now known as pseudo-strophanthin, certainly exists in several kinds. Arnaud prepared it from seed (probably green) supplied by T. Christy as *S. kombé*. The green seed used by Kohn was certainly not that of *S. hispidus*, and Merck manufactures the same glucoside from brown seed (*S. hispidus*). This difference accounts for the discrepancies observed in the effects of strophanthin and strophanthus tincture.

It is, therefore, necessary to establish the difference between strophanthin and pseudo-strophanthin.

The strophanthin used in my experiments was prepared by C. F. Böhringer & Son, of Waldhof, according to Fraser's method. It was quite pure and free from pseudo-strophanthin, and presented all the characters described by Fraser.

In comparing strophanthin with pseudo-strophanthin the account given of the latter by L. Kohn was relied upon, as well as his statement that the glucoside he prepared was identical with that of Merck, and agreed with Arnaud's description, except in its optical characters.

The investigation of the toxic effects of strophanthin and pseudo-strophanthin was carried out by Dr. Höber. The ψ -strophanthin of Arnaud was examined in this respect by Gley, who found it to be nearly twice as active (about 5 : 3) when applied subcutaneously as strophanthin, costing three to four times as much.

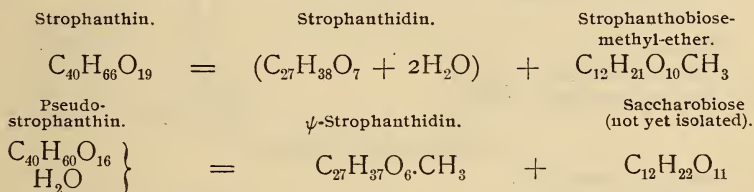
The necessity of distinguishing between strophanthin and pseudo-strophanthin is evident ; that should be done in the pharmacopœias and in labelling the commercial articles, and it may even be necessary in every instance to state on the label the lethal dose per kilo.

The composition of strophanthin in the anhydrous state is represented by the formula $C_{40}H_{66}O_{19}$. Kohn and Kulisch give as the formula of dried pseudo-strophanthin either $C_{31}H_{48}O_{12}$ (Arnaud), $C_{30}H_{46}O_{12}$, or $C_{38}H_{58}O_{15}$, the latter being most in accord with the amount of methoxyl. Calculated for 40 carbon the formula would

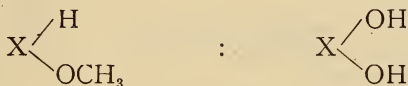
be $C_{40}H_{60}O_{16}$, which agrees with the data of analysis, and still better with the methoxyl amount.

	Found (Kohn).	$C_{38}H_{58}O_{15}$.	$C_{40}H_{60}O_{16}$.
C	60.24-60.89	60.47	60.30
H	7.54-7.82	7.79	7.55
CH ₂ O . .	3.4 - 3.77	4.11	3.89

Accordingly, strophanthin differs from pseudo-strophanthin by containing three molecules of water more. Both substances contain one methoxyl group; but while that of strophanthin is found, on hydrolysis, in the carbohydrate product, that of pseudo-strophanthin is retained in the ψ -strophanthin. The hydrolysis in each case may be represented by the following equations:



Accordingly, pseudo-strophanthin would be the methyl ether of a substance $C_{29}H_{38}O_6$ containing one oxygen atom less than strophanthin. Those substances would, therefore, have the same relation to each other as methoxybenzene and dioxybenzene:



Strophanthin and pseudo-strophanthin differ in melting point, their optical rotation, as well as in the coloration they give with sulphuric acid. A sample obtained from Schuchardt gave a red color with sulphuric acid like ψ -strophanthin, though in other respects it perfectly resembled the strophanthin giving a green coloration, and that may have been due to the preparation being old. Some years ago the observation was made that old seeds which had formerly given a green coloration with sulphuric acid had, after keeping, given a red coloration. Perhaps the isolated glucoside may be liable to a similar alteration, though the specimens I have had for three years still continue to give the green color.

A further difference between the two glucosides is apparent in the hydrolysis caused by acid. By slowly warming strophanthin with

dilute hydrochloric acid (1 in 200), the alteration takes place readily and the full amount of strophanthidin separates suddenly in fine needles. On the contrary, pseudo-strophanthin requires much stronger acid, which must be heated to the point boiling before the insoluble product of alteration begins to separate in flocks.—Franz Feist, in *Apotheker Zeitung*, XV, 469; through *Pharm. Jour.*, 1900, p. 314.

PHILADELPHIA HOSPITAL FORMULARY.

(Continued from page 437.)

SYRUPI.

Syrupus Hypophosphitum Cum Ferro.

Each teaspoonful contains:

Ferrous Lactate	1 gr.	0.065 gm.
Acid, Lactic	2 m.	0.12 c.c.
Syrup, Hypophos., to measure	1 fl. dr.	4 c.c.

Dose: One or more teaspoonfuls.

Philadelphia Hospital.

Syrupus Potassii Iodidi.

Each teaspoonful contains:

Potassium Iodide	10 gr.	0.6 gm.
Syrup, Sarsap. Comp., to measure	1 fl. dr.	4 c.c.

Dose: One to two teaspoonfuls.

Syrupus Potassii Iodidi Compositus.

Each teaspoonful contains:

Potassium Iodide	10 gr.	0.6 gm.
Mercuric Chloride, Corrosive	$\frac{1}{4}$ gr.	0.003 gm.
Syrup, Sarsap. Comp., to measure	1 fl. dr.	4 c.c.

Dose: One to two teaspoonfuls.

Syrupus Quininæ

Each teaspoonful contains:

Quinine Hydrochlorate	2.5 gr.	0.15 gm.
Ac. Hydrochlor., Dil.	1.25 m.	0.075 c.c.
Glycerin	7.5 m.	0.45 c.c.
Syrup	22.5 m.	1.3 c.c.
Water, Chloroform, to measure	60 m.	4 c.c.

Dose: One to four teaspoonfuls.

TINCTURÆ.

Tinctura Digitalis.

(Fat-free.)

Each teaspoonful represents:

Powdered Digitalis (Fat-free)	8.5 gr.	0.55 gm.
Water, Ammonia, sufficient.		
Diluted Alcohol, to measure	1 fl. dr.	4 c.c.

Fat-free Digitalis is made by exhausting the ground leaves with petroleum benzin to remove fat, etc., and drying the residue thoroughly to remove traces of benzin odor. The fat-free tincture is made from the fat-free digitalis by percolating with diluted alcohol to exhaustion and neutralizing free fatty acids in percolate with sufficient water of ammonia. Lastly, sufficient menstruum is added to percolate to make the necessary volume.

Dose: 10 to 30 minims.

J. W. E.

Tinctura Piperis Nigri.

Each teaspoonful represents:

Powd. Black Pepper	4 gr.	0.25 gm.
Alcohol, to measure	1 fl. dr.	4 c.c.

Dose: 15 to 60 minims.

UNGUENTA.

Unguentum Album.

Zinc Oxide	30 gr.	2 gm.
Alcohol	1 fl. dr.	4 c.c.
Oil, Castor, to measure	1 fl. oz.	30 c.c.
		Hornor.

Unguentum Balsami Peruviani.

Balsam, Peru	1 dr.	4 c.c.
Petrolatum, to make	1 tr. oz.	30 gm.

Unguentum Hydrargyri Ammoniaci.

Mercury, Ammoniated	48 gr.	3 gm.
Glycerin	30 m.	2 c.c.
Cerate, to make	1 tr. oz.	30 gm.
		Philadelphia Hospital.

Unguentum Ichthyol.

Ichthyol (Am.)	1 dr.	4 gm.
Cerate	7 dr.	26 gm.

Unguentum Mauri.

Powd. Rhubarb	30 gr.	2 gm.
Powd. Opium	30 gr.	2 gm.
Oint. Mercuric Nitrate	1 dr.	4 gm.
Petrolatum, to make	1 tr. oz.	30 gm.
		Maury.

Unguentum Petrolati Carbolatum.

Acid, Carbolic	30 m.	2 c.c.
Glycerin	30 m.	2 c.c.
Petrolatum, to make	1 tr. oz.	30 gm.

Unguentum Zinci Carbolatum.

Acid, Carbolic	30 m.	2 c.c.
Glycerin	30 m.	2 c.c.
Ointment, Zinc Oxide, to make	1 tr. oz.	30 gm.

EDITORIAL.

THE PEOPLE AND THE PHARMACOPŒIA.

There are some pharmacists who would be content to have the Pharmacopœia contain only those preparations or similar ones which they with the facilities at their command a generation ago could make. On the other hand, there are those who would have the Pharmacopœia contain all those substances and preparations which from "hear so" and "say so" are being prescribed. One class would keep the book too far behind the times and the other make it unsafe for the times.

All those who have followed the evolution of the Pharmacopœia must recognize that the scope of the work is changing from a more or less uncertain volume without clearly defined principles to one of a definite purpose. This evolution has depended in a measure on the progress in the sciences as well as in medicine. While certain physicians may still use "shot-gun" prescriptions, the more discerning of them utilize few remedies, adjusting them in doses and combinations to suit the patient. The newer medicine has to do with definite substances rather than mixtures, and it is evident that the Pharmacopœia must follow in the direction of more exact medicine as rapidly as the province is outlined and the principles established. But what is to become of the mixtures and drugs which, though less prescribed, are still used by the common people as well as by some physicians?

E. M. Holmes, in his Presidential address before the British Pharmaceutical Conference (see *Pharm. Jour.*, 1900, p. 125; also this JOURNAL, 1900, p. 440), makes some pertinent remarks on this subject of the people being, to a certain extent, their own physicians. He says:

"There is no law to prevent a man, however ignorant he may be, from prescribing remedies for himself, his friends or his household, and it has been stated on high medical authority that it would not be objectionable for persons to apply at a pharmacy for simple remedies for toothache, muscular pain or trifling dyspeptic ailments, provided the person seeking relief knew what he was about and was not deceived by the assumption of an authority or of titles on the part of the chemist, and provided that such relief was merely to be regarded as first aid or a temporary expedient for a definite complaint stated by the patient."

While it is evident that it is dangerous for the people, generally speaking, to take their lives, when in ill health, in their own hands, still it must be admitted that much of the knowledge of medicine is empirical and has come to us by virtue of the experiences of people (for generations back) who did not understand the action of drugs, but who found out in nature's own way how to alleviate their sufferings and cure their ills. There is much practical medicine still in the heads of certain classes of people who use their common sense. They still go to the apothecary or herb vendors of the markets for sassafras, boneset, mandrake, etc., and when the baby has colic give it soda-mint, Dewee's carminative, etc.; and when a muscle aches a liniment will be had of the apothecary. So far as we know, they seem to be as well off as the patient loaded down with calomel or salicylates, or the baby dosed with chalk-mixture, etc. Nature seems to have been the great restorative, correcting the ills of the body and the abuses of medicines. People will, in a measure, continue to order their own medicines, and if the Pharmacopœia does not contain the important time-honored and tried medicines in its pages there should be some one book which should take cognizance of these drugs and preparations as rapidly as they are discarded by the Pharmacopœia. It is not sufficient to say that *other* books will contain descriptions of these medicaments and the proper formulæ, as it is well known there are books and there are books. Very recently a work by a physician and teacher in a medical school, which contained such information as the following, was reviewed in this JOURNAL: "Taka-diastrase, a ferment produced by the action of Japanese rice fungus; used as a disinfectant." Fortunately, the National Formulary has arisen in the United States, and promises to be the authorized *vade mecum* of all drugs and preparations that have been useful in their day in the hands of the intelligent medical practitioner and which have been replaced by substances far more efficient in his hands, but which are still largely used by the common people as well as by some physicians. While the Pharmacopœia will doubtless contain such information as assures uniformity in the more important drugs and substances employed in medicine by the intelligent physician, the National Formulary should become the authorized volume to insure to physicians as well as the public drugs of nearly uniform kind and preparations of nearly uniform composition that are still largely used, but

which for one reason or another are not in the Pharmacopœia. Medicines concern not only the physician and apothecary, but the people even more directly, and the development of the National Formulary should be in the interests of the people who will not only call upon the physician, but who will continue to "doctor" themselves. It would be well, therefore, if as pharmacopœial principles shape themselves, the scope of the National Formulary be increased and its influence extended so that apothecaries can supply according to some established standard the non-pharmacopœial drugs and medicines which some physicians may prescribe or the people order.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

THE OIL-CHEMIST'S HAND-BOOK. By Erastus Hopkins, A.M., Chemist in charge of U. S. Laboratories, Boston. New York: John Wiley & Sons.

The title of this book is not quite exact in its reference to the subject-matter treated. It is only when we open at Chapter I that we meet the statement "fixed oils and fats are here considered; the hydrocarbon oils are considered only so far as they enter into combinations with fixed oils and fats as adulterants." The petroleum refiner or chemist specially engaged in the mineral oil industry ordering the book by title would naturally feel disappointed on opening it and finding the statement quoted.

The book is made up of two parts—a series of tables, giving the physical and chemical constants of the fixed oils, fats and waxes, and descriptions of the physical and chemical methods for the analysis of these materials. The first of these parts is much the most valuable portion of the book, as the author has gathered with great industry, and, as far as we have had occasion to compare, with accuracy, such analytical figures with regard to the oils as can be put in tabular form. The tables cover also quite an amount of information such as statements as to source of oils, process of manufacture, characteristic tests, adulterations, uses, etc., of course in very condensed form.

The second part of the book, that describing methods, suffers from the effort at condensation, and in some sections is far from being full enough for satisfactory working. If the corresponding

sections in Lewkowitsch's "Chemical Analysis of Oils, Fats and Waxes" be referred to this will be easily shown. The new edition of Allen's "Commercial Organic Analysis" also is much more satisfactory in this respect.

The book, however, contains a vast amount of useful information, compactly presented and conveniently arranged in tabular form. It will no doubt fill the author's claim that it will be a very useful, handy book for reference in examining the fixed oils and fats.

S. P. S.

THE VOLATILE OILS. By E. Gildemeister and Fr. Hoffmann. Written under the auspices of the firm of Schimmel & Co., Leipzig. Authorized translation by Edward Kremers. With four maps and numerous illustrations. Milwaukee: Pharmaceutical Review Publishing Company. 1900. \$5 net.

The American edition contains all the valuable features of the original German edition, which was reviewed in this JOURNAL, 1899, p. 439, and, in addition, the translator has brought the book up to date. Dr. Kremers' continued work on the volatile oils has rendered him particularly competent to undertake the translation.

The contents of the work are distributed as follows:

I. Historical Introduction: The spice trade in antiquity and during the Middle Ages; history of volatile oils; history of the methods of distillation and of distilling apparatus.

II. General Part: The theoretical basis for obtaining volatile oils by steam distillation; the more commonly occurring constituents of volatile oils; the examination of volatile oils; list of plants, arranged according to families, from which volatile oils are obtained. Special Part: History, origin, preparation, properties, composition, examination and commercial statistics of the volatile oils. The Bibliographical Notes have been placed in an appendix. A comprehensive Index completes the volume.

The volatile oils represent a group of plant constituents of peculiar interest to the apothecary as well as pharmaceutical or manufacturing chemist, and it is extremely fortunate that there is a comprehensive authentic work in English bearing on this subject.

PRACTICAL URINALYSIS AND URINARY DIAGNOSIS. A Manual for the Use of Physicians, Surgeons and Students. By Charles W. Purdy. Fifth revised and enlarged edition. With numerous illus-

trations, including photo-engravings, colored plates and tables for estimating total solids from specific gravity, chlorides, phosphates, sulphates, albumen, reaction of proteids, sugar, etc., in urine. 6 x 9 inches. Pages xvi-406. Extra cloth, \$3 net. F. A. Davis Company, publishers, 1914-16 Cherry Street, Philadelphia.

In addition to the present edition being a revision of the fourth edition, it contains a new chapter on the microscope and its use in urinalysis, and the author has extended the range of centrifugal analysis so that it includes more complete as well as practical data for urinary work. The chemical portion of the work has been carefully revised, a few quantitative methods have been added where previously omitted, and nearly the whole subject of testing albumen in the urine has been rewritten.

This may be said to be one of the most valuable practical works on urinalysis, and while of peculiar interest to the physician, it ought to be in the hands of those pharmacists who conduct analyses of this nature. The relation of the chemistry of the urine to physiological processes and pathological facts is prominently set forth, so that in dealing with normal urine each constituent is considered as follows: Its chemical nature and composition; its source in the economy; the significance of its increase or decrease in the urine, with the relations of these to metabolic processes, food supply, physical surroundings, and tendency toward disease; and, finally, the most approved methods of its detection and determination have been described. In considering the morbid constituents in abnormal urine, their chemical nature and composition, source in the economy, chemical significance of appearance in the urine, the most approved methods of detection and determination are described. A valuable chapter on the subject of urinary examinations for life insurance is added.

COLLEGE ANNOUNCEMENTS.—The following announcements have been received: Albany College of Pharmacy, the Brooklyn College of Pharmacy, California College of Pharmacy, Cleveland School of Pharmacy, Illinois College of Pharmacy, Massachusetts College of Pharmacy, Minnesota University School of Pharmacy, Ontario College of Pharmacy, St. Louis College of Pharmacy, Vanderbilt University, Department of Pharmacy.

The following changes are announced in the Buffalo College of Pharmacy: Edward J. Kiepe, formerly Instructor in *Materia Medica*, has been elected Professor of that branch; Albert P. Sy has been elected Instructor in Chemistry, and Willett H. Mosher returns as Instructor in *Pharmaceutical Assaying*.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

The second annual meeting of the N.A.R.D. was held in Detroit, Mich., September 12-14, 1900. According to the *Pharm. Era*, 1900, p. 307, "the Association makes no very great departure from its former policy, but it reaffirms with greater insistence its desires and purposes. The various reports of the officers and committees show that much has been accomplished during the past year, and these gentlemen hold out sanguine hopes for the future."

The Committee on Trade-marks and Patents reported through its chairman, John C. Gallagher, that they had embodied their views of the existing defects in the present trade-mark and patent laws in a paper which they had forwarded to the members of the Commission appointed by President McKinley to revise the patent and trade-mark laws of the United States. The substance of the objections to the present laws as presented is as follows:

(1) Of the patent laws in that they grant (a) monopolies on the drug itself, thereby stifling invention and encouraging exorbitant prices; (b) too liberal concessions to foreigners; (c) their laxity.

(2) Of the trade-mark laws in that they grant (a) trade-marks on the name of the article.

(a) The present patent laws are supposed to grant a limited monopoly to the inventor, as a reward for the new good that his ingenuity and labor have conferred on the people at large; often this reward is out of proportion to the deserts of the inventor, for, by granting letters-patent on the article itself and not on the process of manufacture only, we stifle the inventive energy of this country, and deprive the community of the additional benefit that would thereby accrue by reason of the cheapness and improvement of the article itself, through the discovery of improved and more economic methods of manufacturing; hence, the monopoly is too extensive and stimulation of personal greed results as opposed to the general good. The classes and not the masses are directly and indirectly benefited, exorbitant prices are demanded and exacted. An illustration of this fact may be adduced from the well-known medicinal remedy, antipyrine, which, when under the protection of our patent laws, that throw too many safeguards around the article instead of the process of manufacture, retailed for \$1.50 an ounce; after expiration of the patent the same article may be bought for 18 cents an ounce.

(b) Foreign countries, viz., Argentine, Austria, Belgium, Bolivia, Denmark, France, Germany, Hungary, Italy, Japan, Norway, Portugal, Russia, Sweden, Turkey, Uruguay, do not grant patents on medicinal preparations and chemicals; some grant the patent on the process only—not on the product; surely our country, which makes the proud boast of encouraging and protecting home industry, should not be less solicitous of its citizens' welfare than the countries already enumerated are. Some of these countries compel the inventors as a

condition upon which the patent is granted to manufacture the article within the confines of the country that grants the letters-patent; we do not, and the result is that an article patented in this country may be manufactured in another country, and imported, much to the detriment of our home industries. Here again the general good is ignored and private gains augmented. Protection to other industries has produced such good results that to-day they are exporters instead of importers, while in the drug industry the opposite obtains, owing to the fact that our government grants by the present patent laws more concessions to foreign countries than they will give to us.

(c) It is a notorious fact that many letters-patent are granted on drugs and chemicals that cannot substantiate their claims of conferring additional good on mankind. This is due to the laxity of our present patent laws, and owing to the failure of proper investigation and experimentation being instituted to attest these claims, the average time given to the consideration of an application is not sufficient to fully establish the merits or demerits of the invention.


The remedy we desire is: (1) That adequate time be given to investigate the merits claimed by the inventor, so as to demonstrate that it is novel, and thereby confers additional good on the country at large. (2) Patents should be granted on the process only—not on the product. (3) Articles made according to the process patented must be manufactured in this country. (4) No foreigners be granted greater privileges in this country than is given to them by their own. As an alternative for (2), we desire that the revised patent laws forbid the granting of letters-patent of medicines as the term is understood in the art of healing.

Trade-Marks.—The predominant iniquity of our present trade-mark laws is that they secure to the owner a too exclusive right to the name of the article. This name might be a word coined by him, or one or a combination of two or more words in ordinary usage; they allow possessors of patents to continue the life of the monopoly granted by the letters-patent by claiming a perpetual protection by reason of their registered trade-mark or trade-marks.

Remedy.—(a) No trade-mark be granted on a name or combination of names coined or otherwise. (b) That the trade-mark rights be confined entirely to brands, symbols, signs and devices.

The following officers were elected:

President, W. C. Anderson, Brooklyn, N. Y.; First Vice-President, James W. Seeley, Detroit, Mich.; Second Vice-President, Jesse L. Nelson, Jackson, Tenn.; Third Vice-President, Frank L. Way, Manchester, N. H.; Secretary, Thos. V. Wooten, of Chicago; Treasurer, Chas. T. Heller, of St. Paul, Minn. Executive Committee, F. E. Holliday, Topeka, Kan.; D. E. Prall, Saginaw, Mich.; Simon N. Jones, Louisville, Ky.; Alfred DeLang, Cincinnati, O.; A. Timberlake, Indianapolis, Ind.; Jas. C. Perry, Philadelphia, Pa.



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OINTMENTS.

WITH A FORMULARY OF THE OINTMENTS IN USE AT THE GERMAN
HOSPITAL, PHILADELPHIA.

BY M. I. WILBERT.

Ointments are among the oldest of our pharmaceutical preparations. Their discovery, or introduction, would seem to date back long before the dawn of any known historic era. The ancient Egyptians used ointments very extensively for medicinal as well as for toilet purposes. According to Dioscorides the use of ointments was so extensive in ancient Egypt that their manufacture had developed into a distinct specialty or art, and the ointment makers of that time were not only numerous, but also highly respected. The same writer, in his Treatise on Materia Medica, has preserved the formulas of several of the more popular and well known Egyptian ointments of his time.

From Egypt the art of making these preparations gradually spread to other Oriental countries, where they were and still are quite extensively used, especially for toilet purposes. As a toilet article they were used to counteract the strong and, in many cases, somewhat disagreeable exhalations from the human body; with many of these Eastern people ointments were a substitute for soap and water.

The Jews classed ointments among the necessities of life, and used them freely, especially as an adjunct to the toilet on festive occasions. With these people the non-use of ointments was considered to be a sign of sorrow and mourning.

An indication of the age of this class of preparations is found in

the fact that from the earliest historic times they have been included in the religious practices and ceremonials of various races. Among the Jews temples and places of worship were consecrated and priests, prophets and kings were introduced into their offices by anointing them with sacred ointments.

The old Egyptians anointed their gods and temples on festive occasions, and from here the practice probably spread to Greece and other countries with whom the Egyptians came in contact.

This use of ointment, as a part of religious ceremonial, has been preserved, and in both the Greek and Roman churches of to-day the sacred ointments form an essential part of many of their ceremonies.

The ancient Greeks made use of ointments to anoint their athletes, so as to make their joints more supple and to give them additional strength for the various contests.

From a pharmaceutical point of view ointments are of especial interest for several reasons, one of them the periodic discussions as to the proper or most satisfactory base to be used in their preparation. The number of compounds or mixtures that have been recommended from time to time as a suitable or satisfactory base for ointments are too numerous to even enumerate, to say nothing of entering into a general discussion as to their relative merits. We will confine our remarks, therefore, to a discussion, or, perhaps, what would seem more appropriate, to an expression of opinion as to the relative value and adaptability of lard and petrolatum as a base for the official ointments.

The present United States Pharmacopœia recognizes twenty-three official ointments. In twenty of them lard is the chief ingredient of the base.

The same Pharmacopœia also defines what is meant by the term lard, and gives a number of tests for its identification and the detection of foreign substances or adulterations.

Such pharmacists as have ever applied these tests will admit that it is rather difficult, if not well-nigh impossible, to obtain lard in the open market that will come up to all the requirements of the Pharmacopœia, and that practically the only way of obtaining a thoroughly pure and satisfactory article is to make it, by trying out the so-called "leaf lard," although at times this is rather difficult to obtain, as the large packing houses, who practically control the

supply of meats in the large cities, have entered into the manufacture of lard, lard oil and lard substitutes on an extensive scale, and for this reason do not market the raw product.

When we come to consider the therapeutic use of ointments we find that they may generally be grouped in one of two classes, and are used for either their local or general effect. Those classed in the first group are used for the protective, emollient or stimulating effect of the base, or of the combined base and medicinal ingredient on the skin and superficial tissues. Among these we may mention cold cream, petrolatum and the ointment of oxide of zinc.

In the second class we make use of the base as a vehicle to carry, or, in some cases, to facilitate the absorption of more or less active medicinal ingredients for their resolvent or alterative effect. In this class we may place such ointments as the ointment of potassium iodide, salicylic acid and mercury.

As a vehicle to facilitate the absorption of active medicinal ingredients associated with it in an ointment, lard probably has some advantage over petrolatum, at least that is what the results of physiological experiments would indicate. From a practical point of view, even this may be questioned, as it has been repeatedly demonstrated that such active drugs as potassium iodide, salicylic acid and acetanilid are very readily absorbed into the system from an ointment made up with petrolatum, and even a mercurial ointment made with petrolatum seems to be quite as active as one made with lard and suet, according to the directions of the Pharmacopœia.

It is when we are after the protecting and emollient effect of an ointment that petrolatum offers many points of advantage over animal fats, and as a majority of our ointments are used for their local effect on the skin and superficial tissues, it would seem strange that the Committee on Revision of the Pharmacopœia has not previously recognized the marked advantages offered by this stable, bland, unctuous material. Both the German and British Pharmacopœias have recognized the desirability of supplying a substitute for animal fats in this class of preparations, and for this purpose have introduced as paraffine ointment a mixture of hard paraffine and paraffine oil. This preparation is far from satisfactory, and although theoretically the same as petrolatum, still practically it seems to have distinct physical properties, and will not stand the

same variety of temperature. In warm weather the paraffine usually separates, crystallizing out in granular or in large crystalline masses. The naturally existing mixture of paraffine and oil seems to be more stable than the product of any attempt at imitation.

A few words as to our reasons for preferring petrolatum as a base for ointments :

(1) Economy. Other things being equal, the price of an article always plays a very important part in its selection. In this case the use of petrolatum would effect a saving of from 20 to 30 per cent. in the cost of the majority of ointments.

(2) Non-absorption of the base. This is of decided advantage in cases where a protective covering is the chief object sought for or required. Such ointments as boric acid, carbolic acid and oxide of zinc would meet these requirements better and be more efficacious, while ointments that are used as parasiticides, such as sulphur, tar and red oxide of mercury, would be more practical, less irritating and more stable if made up with petrolatum.

(3) Permanence. There are many readily decomposed chemicals like the mercurial salts that undergo decomposition when in contact with unstable and readily decomposed fats. With this class of chemicals the advantage of using an inert and stable base is self-apparent.

Some seventeen or eighteen years ago, when the question of using a petroleum compound was suggested to the revisers of the United States Pharmacopœia, it was thought that the supply of petrolatum was too uncertain, and too varied, and for this reason the Committee did not see its way clear to adopt any of the very excellent formulas presented to it by Professor Remington. The same objections do not exist at the present time, and have not existed for ten or twelve years, as upward of half a dozen manufacturers are marketing a product that is practically identical in appearance and in physical properties.

Ointments made up according to the appended formulary have been in use at the German Hospital for the past ten years with uniformly good results and in constantly increasing quantities. During the year of 1899 there were made in the laboratory of the German Hospital 312 kilos of these various ointments.

I would like to add a few words of comment or explanation of some of the formulas.

The ointment of boric acid is practically identical with that of the German Pharmacopœia. It has a wide field of usefulness as a mild antiseptic protective dressing, and deserves a place in our Pharmacopœia.

The other formulas are all more or less familiar. As a rule, they are modifications of official formulas, substituting petrolatum for the usual base. The ointments of belladonna, nutgall and stramonium are more permanent and more slightly than when made up according to the official formulas.

It will be noted that the strength of the ointment of yellow mercuric oxide is but 2 per cent. This is what is popularly known as Pagenstecher's eye salve, and is what the majority of oculists expect to have dispensed when they write for "Ung. Hydrarg. Ox. Flav." The 10 per cent. official ointment is considered too strong to be used in the eye, as an excess of mercuric oxide is apt to be irritating instead of soothing. Many pharmacists when making this ointment do not devote sufficient care to reducing the masses of mercuric oxide to a fine powder, and as a result dispense a more or less gritty ointment. These gritty particles sometimes act as foreign bodies in the eye, and are apt to be quite irritating. We have found a few drops of oil or water to be of decided advantage in reducing the gritty masses of mercuric oxide. In making up quantities of any ointment, it sometimes requires considerable ingenuity to devise ways and means of getting a satisfactory product without the use of expensive machines or the undue expenditure of time. Several of these problems we have solved, at least to our own satisfaction. For instance, in making ointments of boric acid or sulphur, we have found it to be of advantage to melt the petrolatum, remove it from the source of heat, and just as it is about to congeal, sift in the required powder through a fine sieve, constantly stirring the mass. By this means a homogeneous mixture may be readily and easily obtained.

In making the ointment of zinc oxide, we first thoroughly dry the powder, then incorporate it with a portion of the melted petrolatum, keeping the mixture quite hot; this mixture is subsequently run through a No. 40 sieve, and the sieve rinsed out with additional portions of the melted petrolatum, until the required quantity has been added; then stir until cold. This process assures a smooth ointment in which the oxide of zinc is finely divided and thoroughly incorporated with the ointment base.

The ointment of turpentine is practically the compound resin cerate of 1870, with the substitution of petrolatum for the animal fats. This ointment is rather more stimulating than the official cerate, and for that reason more desirable. The ointment of rose water differs from the official in that oil of cotton seed takes the place of the expressed oil of almonds, and the use of distilled water and oil of rose instead of stronger rose water. This formula gives a very smooth ointment that stands well, and while it is not as white as the official ointment, it is correspondingly cheaper.

OINTMENT OF BORIC ACID.

Boric acid	100
Petrolatum	900

OINTMENT OF CARBOLIC ACID.

Carbolic acid	50
Petrolatum	950

OINTMENT OF ROSE WATER.

Spermaceti	125
White wax	120
Oil of cotton seed	600
Sodium borate	5
Distilled water	190
Oil of roses	2 drops.

BELLADONNA OINTMENT.

Alcoholic extract of belladonna leaves	100
Diluted alcohol	50
Petrolatum	850

OINTMENT OF BELLADONNA AND MERCURY.

Belladonna ointment	500
Mercurial ointment U.S.P.	500

NUTGALL OINTMENT.

Nutgalls in fine powder	200
Petrolatum	800

OINTMENT OF GALLS AND OPIUM.

Powdered opium	5
Nutgall ointment	95

OINTMENT OF AMMONIATED MERCURY.

Ammoniated mercury	100
Petrolatum	900

OINTMENT OF YELLOW MERCURIC OXIDE.

Yellow mercuric oxide	20
Petrolatum	980

OINTMENT OF RED MERCURIC OXIDE.

Red mercuric oxide	100
Petrolatum	900

IODINE OINTMENT.

Iodine	40
Potassium iodide	10
Water	10
Petrolatum	940

ODOFORM OINTMENT.

Iodoform	100
Petrolatum	900

TAR OINTMENT.

Tar	250
Petrolatum	250

OINTMENT OF LEAD IODIDE.

Lead iodide	100
Petrolatum	900

OINTMENT OF POTASSIUM IODIDE.

Potassium iodide	100
Water	50
Petrolatum	850

STRAMONIUM OINTMENT.

Extract of stramonium	100
Diluted alcohol	50
Petrolatum	850

SULPHUR OINTMENT.

Sublimed sulphur	300
Petrolatum	700

OINTMENT OF TURPENTINE (COMPOUND RESIN CERATE).

Resin	240
Yellow wax	240
Petrolatum	300
Oil of turpentine	120
Linseed oil	100

OINTMENT OF ZINC OXIDE.

Zinc oxide	200
Petrolatum	800

OINTMENT OF ZINC AND ICHTHYOL.

Ichthyol	50
Ointment of zinc oxide	950

THE ORIGIN AND HISTORY OF THE NATIONAL
WHOLESALE DRUGGISTS' ASSOCIATION.

BY MAHLON N. KLINE.

The history of an association which has had so much to do with correcting the evils which existed, and still exist, in the wholesale drug business of this country, and which has been so influential in matters of vital interest to the business side of the retail druggists of this country, is doubtless a proper one to read before this organization. No one is better qualified to write this history than Mr. A. B. Merriam, who was elected Secretary of what is now the National Wholesale Druggists' Association at its first meeting held in 1876, and who has held that position continuously up to the present time. A few years ago, in connection with an article which I then prepared for the *Pharmaceutical Era*, Mr. Merriam contributed the following, which I have concluded to use as a part of this paper:

“The prominent position which the National Wholesale Druggists' Association occupies to-day is in itself a suggestion that there may have been a time in the history of the wholesale drug trade when demoralization in business methods may have existed. Some, who were themselves suffering from causes prolific of danger, determined to improve the condition which then existed in the prosecution of a business which is not only honorable in itself, but should yield a recompense commensurate with the vast amount of capital, talent and energy requisite for its successful accomplishment. The decade following the close of the Civil War was significant of business adventures without experience in the careful training of the counting-room, and the progressive step of advancement of the embryo merchant from the messenger boy to the proprietor. The rapid accumulation of wealth during and immediately following the war had induced many to enter the drug business with their capital, and, with associates ambitious for success, they disregarded not only natural territorial lines of trade, but defiantly challenged competition at all times and everywhere.

“Probably at no time in the history of the drug trade of the country was there as great demoralization in prices and business methods as prevailed during the five years preceding 1876. The ambitious representatives of the leading firms in the West and Northwest were instructed to ‘get the trade,’ and no limit seemed

to be put upon prices, misrepresentation and intrigue. Leading proprietary goods, consisting of one-third to one-half of the jobber's sales, were alluring 'baits,' and went in with the general order, oftentimes at less than the actual cost delivered at warehouse, not to take into calculation the cost of doing business. The reports of the travellers to the principals were often misrepresentations of the methods of business of their competitors, until a spirit of jealousy and ill-will had been inaugurated which was alike unmercantile and unchristian.

"It was during this condition of affairs that the first effort was made to check the spread of business outlawry in the section of the country named; and to Mr. A. Kiefer, of Indianapolis, belongs the credit of taking the initiatory steps looking to the suppression of the prevailing evils. Mr. Kiefer addressed a communication to Mr. James S. Burdsal, of the wholesale drug firm of J. S. Burdsal & Co., of Cincinnati, calling attention to the demoralized condition of the trade, and afterwards following the letter in a personal visit of consultation with the leading drug firms of that city. While the credit of the advance movement in the proposed reforms has been given to the wholesale druggists of Cincinnati (and justly so), it was part of the plan of Mr. Kiefer that the commanding position of that city would be more effective if the movement was started there, instead of in his own city of Indianapolis. This statement of facts by one familiar with the events at the time is due to Mr. Kiefer, for no 'pre-emption claim' of his has ever been filed for the conception of one of the most successful organizations of the present generation.

"Early in the month of February, 1876, Mr. Burdsal addressed a letter to each of the wholesale drug firms of Cincinnati to meet in the room of the Board of Trade. Every firm was represented, and the meeting was organized by the election of Mr. J. S. Burdsal, Chairman, and Mr. A. B. Merriam, Secretary. The object of the call was presented by Mr. Burdsal, and the views of all present were fully expressed as to the proper steps to be taken. A resolution was adopted calling a convention of all the wholesale druggists of the West and Northwest at such time and place as the majority should favor. The Secretary was instructed to issue a circular letter to the trade, reporting the preliminary action of the druggists of Cincinnati, and the necessity for a general consultation on the disturbed condition of the trade then prevailing. The replies were

prompt and unanimously expressive in favor of the movement, and the majority sentiment decided that the geographical position of Indianapolis was best adapted for the convention. The official call was then sent out, and on the 15th day of March, 1876, the warring elements of the trade first convened. Many had never seen each other before, but by reputation formed by exaggerated reports through unbridled competition they were prepared

“ ‘To meet the very d—l in human form,
Emasculated only of hoof and horn.’ ”

“ The registers at the hotels were rapidly filling with the names of well-known firms from Cleveland, Toledo and Pittsburg on the East ; St. Paul, Milwaukee, Detroit and Chicago on the North ; Louisville and Cincinnati on the South, and St. Louis and other points on the West.

“ It was a memorable gathering, and when such men as James Richardson, C. F. G. Meyer, A. A. Mellier, Jacob S. Merrell, St. Louis ; Daniel R. Noyes, St. Paul ; Henry W. Fuller, Thomas Lord, Peter Van Schaack, Chicago ; S. M. Strong, Horace Benton, Daniel Myers, Cleveland ; George A. Kelly, John Ewing, B. S. Fahnestock, Pittsburg ; Arthur Peter, R. A. Robinson, J. B. Wilder, W. A. Robinson, Louisville ; Robert Macready, James S. Burdsal, William S. Merrell, Cincinnati ; Jacob S. Farrand, Thomas H. Hinchman, Detroit ; Henry H. Button, F. Dohmen, B. B. Hopkins, Milwaukee ; Charles West, William C. Williams, Toledo ; Robert Browning, A. Kiefer, Daniel Stewart, Indianapolis, met to deliberate on the ‘ affairs of trade,’ it augured well for the success of the convention. The first session met in Exchange Hall at 10 o’clock on the morning of the fifteenth of March, and was organized by the election of James S. Burdsal temporary Chairman and A. B. Merriam temporary Secretary.

“ Mr. Burdsal, on taking the chair, addressed the convention in a forcible speech, briefly reviewing the action of the wholesale druggists of Cincinnati in the initiatory steps they had taken looking to the call of this convention ; the presentation of some of the evils that had fastened themselves upon the trade ; the excessive competition, resulting in the general demoralization of values ; the unwise and unmercantile policy of sacrificing sound business principles in the strife for precedence, and closed by expressing an earnest hope

that unity of sentiment and harmonious action would prevail in the deliberations of the convention. The Secretary called the roll, when it was found ninety-five firms were represented in person or by proxy. A committee was appointed on permanent organization, who reported the following day, as follows:

“ President—James Richardson, St. Louis.

“ First Vice-President—Robert Browning, Indianapolis.

“ Second Vice-President—Arthur Peter, Louisville.

“ Third Vice-President—R. Macready, Cincinnati.

“ Fourth Vice-President—Thomas Lord, Chicago.

“ Fifth Vice-President—John Ewing, Pittsburg.

“ Treasurer—Samuel M. Strong, Cleveland.

“ Secretary—A. B. Merriam, Cincinnati.

“ Previous to the election of officers and adoption of the constitution and by-laws, the following committees were appointed, which reported during the sitting of the convention:

“ Committees on Proprietary Medicines; on Credit System; on Circulars and Price Lists; on Western Wholesale Drug Association; Commercial Travellers; Adulterations, and Legislation.

“ The reports of those committees, having in charge the special interests which had attracted so large a delegation, voiced to a gratifying degree the expectations of those who were now hopeful for a better condition of things. The discussions were characteristic of the men who had left their business, many of them on long lines of travel, to remedy, if possible, great and crying evils, demoralizing in their influences and destructive to a legitimate profit in a business requiring long experience and a large amount of capital. While it was not expected that the ‘day of jubilee’ would then be announced, or that the panacea would be offered at this convention which would by fiat of resolution change the hearts and natures of men, it was evident during the two days’ meeting that great good would result from it. Competitors met face to face, and earnestly discussed remedies which should commend themselves to the better judgment and reason of sensible business men. Many saw and personally knew each other for the first time, and the bitter acrimony engendered by excessive competition, with heralded reports of ‘dishonesty’ and ‘rascality,’ was now assuaged by personal contact and a better knowledge of each other. The hearty handshake of the first meeting will be a talismanic reminder of the

promise to avoid the old evils when temptation comes, and hold fast to promises to the new friends and the better order of things, honestly and manfully adopted in the resolutions and acts of the convention, to which each subscribed. The election of officers, as reported by the Committee on Permanent Organization, and the adoption of the constitution and by-laws were the closing acts in the drama which ushered into being the 'Western Wholesale Drug Association.' "

The organization whose early history Mr. Merriam wrote as above continued to be known up to 1882 as the Western Wholesale Drug Association. At the meeting of that association held in Cleveland that year, a large representation from prominent wholesale drug firms in the East was present, and also a large delegation from the Association of Manufacturers and Wholesale Dealers in Proprietary Articles, which is now known as the "Proprietary Association of America." At this meeting, the interests for which the Western Association was originally formed having extended throughout the trade circles of the entire country, it was decided by a unanimous vote to change the title to the "National Wholesale Druggists' Association," and amid great enthusiasm the East joined hands with the West, and the history of the N.W.D.A. in the past eighteen years is a continued repetition of increasing interest and loyalty.

While much has been accomplished by this organization in the way of lessening trade evils in many directions, that which called it into existence in the first place, and has always commanded its chief interest since, is the regulation of the prices of proprietary medicines, composing so large a proportion of the business of the wholesale druggist. The success of the effort to regulate these prices has been so marked since 1882, and is so well known, that it is not necessary to do more than refer to it in this connection. The report of the Committee on Proprietary Articles has always been the most important of all of the reports submitted by the various committees at our annual meetings; and the work of this committee has not been confined to looking after the interests of the wholesale dealers alone, but it was early recognized that the interests of the retailers and of the wholesalers and of the proprietors were so closely related that we were bound to aid in every way in our power in the establishment of a plan which should protect, as far as it was

possible to do so, all three branches of the trade. For this reason the Proprietary Committee of this Association has probably given as much time and thought to the interests of the retailers during the last seventeen years as it has to the protection of our own members. The basis of the plan under which the two national associations (the N.A.R.D. and the N.W.D.A.) are working at the present time was first promulgated by our own Proprietary Committee at the annual meeting in Detroit, in 1893.

The pioneer work in establishing a system of uniform selling prices for proprietary articles was done by this committee under the chairmanship of Mr. Daniel Myers, of Cleveland. Associated with him were a number of men who have continuously remained on the committee since. He was succeeded as chairman by Mr. George A. Kelly, of Pittsburg, and Mr. Kelly was succeeded at the meeting of the Association in Boston, in 1887, by myself. I held the chairmanship for ten years, and at the meeting in Richmond, in 1897, was succeeded by Mr. Frank A. Faxon, of Kansas City, who held the office for three years, and upon resigning at the recent meeting held in Chicago, was succeeded by Mr. C. F. Shoemaker, of this city. The amount of work devolving upon this committee, as already stated, is probably greater than that of any other committee in the Association; and the amount of attention given by it to the interests, both of the retailers and of the proprietors, has not by any means been inconsiderable.

Other trade organizations, which were formed most of them after the N.W.D.A., have attempted to regulate selling prices somewhat upon the same plan as our rebate system; but while our Association has been continuously successful and there has been comparatively little disturbance in prices amongst the wholesale trade, the other organizations have, for the greater part, failed in similar efforts. The reason for this is, of course, not difficult to understand. A proprietary medicine is arbitrarily placed upon the market by its maker at a price and under a name which he arbitrarily controls, and upon which, under the trade-mark laws of the country, he is given a monopoly. He is thus in a position to also control the prices and terms under which he will market his product, and occupies a very different position in this regard from the manufacturer of dry-goods or hardware, or any other class of merchandise.

This regulation of prices has frequently been referred to as a "trust." In the article heretofore referred to, I used the following language, which I think it may not be amiss to quote at this time:

"Even some of our drug trade papers, who ought to know better, have here and there expressed a doubt about our being free from objectionable methods, and it is certain that, notwithstanding the continued efforts by our association to assist the retailers in their struggle against unlimited competition, which was recently aptly characterized in a public utterance as 'a perfect devil's game,' we are suspected of being utterly selfish by a considerable portion of your readers.

"Being, therefore, maligned by the public press, and, to say the least, misunderstood by some in the trade, it may not be out of place to bring before your readers the facts concerning our work. In that portion of this article supplied by Mr. Merriam the condition of the wholesale drug trade which led to the formation of our association has already been fully explained. The error of the maxim that 'competition is the life of trade' had already been discovered, and it could truly be said in 1876, as it can to-day, that, if unrestricted, it would also be its death. The conditions were not solely of our making, but were largely the result of barbarism in commerce, as in the uncivilized times and countries there were barbarisms in war; while in our own country the instruments of war had been changed into ploughshares and pruning hooks, war itself was transferred from the battlefields to the counting house. To correct this, as far as in our power lay, an association was formed, which has been signally and continuously successful, because it so largely devotes itself to efforts to correct 'excessive and unmercantile competition,' and because it seeks 'to remove by concert of action all evils and customs that are against good policy and sound business principles.'

"So long as our actions continue to be in harmony with the above declaration of principles contained in our preamble, we will not be likely to become less influential than heretofore in our own trade, nor in the larger field of commerce of which we are a part."

While the work of the Proprietary Committee has been of the greatest possible value both to the wholesale and the retail druggists of this country, the work which some of the other committees have performed has certainly been far-reaching in its influence. The

Committee on Legislation has constantly been on the alert to defeat proposed laws, State and National, which would have seriously affected the interests of the retailers as well as the wholesalers. The movement for the repeal of the Stamp Tax in the eighties received the hearty and influential support of the N.W.D.A.; and it will not be denied that without this support its repeal probably would not have been accomplished. When it again became necessary to impose a Stamp Tax to meet the expenses of the Spanish War, our Legislative Committee closely watched the interests of the proprietors and the wholesalers and the retailers; but to the Legislative Committee of the Proprietary Association must be given the credit of securing the very important modification in the rate of this Stamp Tax before it was enacted into law by the Senate. The movement in favor of its entire repeal, which we hope will be successfully accomplished at the approaching session of Congress, is receiving probably its most influential support from the N.A.R.D.; but the committee of the N.W.D.A. is certainly seconding their efforts in a very efficient manner.

The reports of the Committee on Adulterations have a value which is not always, I fear, fully appreciated by the pharmacists of this country, nor, for that matter, by our own membership. A careful study of the reports which this committee has made at the several annual meetings of our Association will show that public attention is called, through these reports, to many adulterations which are largely minimized, if not entirely corrected, through this very publicity. In addition to this, our organization is now, by its action at the last three annual meetings, squarely on record as favoring a National Pure Food and Drug Law, and its representatives have been influential, in the several sessions of the Pure Food Congress in Washington, in recommending modifications of the law as originally proposed, to render it less onerous to the retail and wholesale drug trade of the United States.

The organization was called into existence at a time when its founders felt that it was necessary that some concerted action should be secured to correct crying evils. It has been successfully maintained during many more years than its early founders dared to hope it would continue in existence, and it promises to maintain its influence so long as its officers and members will hold to the objects named in the preamble to the constitution which was adopted when the organization was formed in 1876, as follows:

“In order to create a permanent social feeling between the wholesale druggists of the country; to obliterate the feeling of distrust and jealousy that seems to exist; to correct excessive and unmercantile competition; to remove, by concert of action, all evils and customs that are against good policy and sound business principles; to establish rules and regulations, that all differences and grievances may be fairly and equitably adjusted—for this purpose we, the undersigned, form ourselves into an association to be known as the Western Wholesale Drug Association.”

This preamble stands for mutual aid in Association work, and for the elevation of business standards and methods. It was sought at the very outstart and has been the continuous purpose since to correct “unmercantile competition,” and no one who has studied the history of this Association will for a moment deny that it has in many instances during the years of its existence succeeded in accomplishing this.

It has extended its influence and directed its action to the alleviation of the “unmercantile competition” existing amongst the retailers as well, whom we have always recognized as our allies, and in whose success we have always recognized that we have a vital interest. It has also not been unmindful of the interests of the manufacturer.

It has, in short, been largely unselfish as an organization in its work, and so long as unselfishness dominates its action it is sure to remain a permanent organization which will be both an example and an inspiration to other mercantile bodies.

Some of these, it will be admitted, have used their associations solely for the purpose of furthering their own selfish interests, and as a result have passed into oblivion.

I close by expressing the hope that our membership will be able to permanently display its motto, adopted at the time the wholesale druggists of the West first founded this organization, viz., that “They builded better than they knew.”

SOME NOTES ON JALAP.

BY ALFRED HEINEBERG.

Owing to the uncertainty in value of specimens of crude and powdered jalap, the author undertook a series of investigations, at the

suggestion of Prof. Henry Kraemer, for determining the value of this drug.

Jalap conforming to the Pharmacopœial requirements as regards quantity of resin appears, judging from the reports of several investigators, to have been, and is to-day, the exception rather than the rule.

Various methods for the valuation of the drug have been set forth from time to time, all depending, more or less, upon the difference in the procedure for extracting the resin; indeed, in only one instance (that of Professor Hager, mentioned below) has any other point except a pharmaceutical assay been suggested as indicating the value of jalap.

The following gleanings from the reports of different investigators will serve to demonstrate the character of the work done on the drug during the last fifteen years.

Mr. G. H. Chas. Klie (Proc. A. Ph. A., 1887, p. 118) found powdered jalap to contain as high as 12.17 per cent. of resin; other samples contained 5.52 per cent., 10.28 per cent., 9.9 per cent. and 6.6 per cent., respectively.

Dr. Squibb (Proc. A. Ph. A., 1888, p. 328) assayed samples of jalap and found the range of resin to be from 6.19 per cent. to 18.5 per cent.; average, 8.8 per cent.

The analysis of samples, between the years 1879-1888, of jalap for making the extract and resin is as follows:

1879	125	pounds	powdered	jalap	gave	17	per	cent.	resin.
1882	220	"	"	"	"	13.4	"	"	"
1883	107	"	"	"	"	7.6	"	"	"
1885	100	"	"	"	"	7.9	"	"	"
1888	250	"	"	"	"	15.6	"	"	"

At that time Dr. Squibb stated that there was not a bale of jalap in the New York market that would yield 12 per cent. of official resin.

Dr. Squibb (*Ibid.*, 1889, p. 427) since his last report (1888) watched the drug markets for jalap and obtained no samples yielding over 9 per cent. of resin, and only two samples which gave over 7.5 per cent.

He sent a special messenger to Jalapa, Mexico, and obtained less than 200 pounds "produced in the old way in the old location" which assayed 16.9 per cent. resin.

Prof. F. A. Flückiger, commenting on this report of Dr. Squibb, offers the assertion that "since twenty years ago jalap tubers yielding 10-17.6 per cent. of resin were of frequent occurrence, and that now (1890) none yielding 10 per cent. can be obtained." The cause of inferiority was the partial extraction of resin by the dealer in Mexico.

E. Dieterich found the yield for 1888 and 1889 to have been 7.1 per cent., 7.7 per cent. and 8.1 per cent.

M. Bouriz (Proc. A. Ph. A., 1883, p. 119) extracted jalap according to Codex method, with the following results:

Picked commercial jalap gave 12.5 per cent., 7.5 per cent., 10.5 per cent., and 8 per cent. of resin.

Virgil Coblentz (*Ibid.*, 1883, p. 120) assayed twelve samples of powdered jalap, and results varied from 3.8-16.2 per cent. of resin, with an average of 8.1 per cent.

"The process recognized by the German Pharmacopœia (*Ibid.*, 1883, p. 120) for distinguishing between light and heavy jalap consists in assay for resin. This is too circumstantial, and what is more, can be extended to only one tuber."

Dr. H. Hager resorts to specific gravity to separate light from heavy tubers.

He employs a solution of common salt, specific gravity 1.140-1.142 at 15°-17° C., and says: "Not less than 90 per cent. of tubers immersed should sink; all of which do not should be rejected." For good tubers have a specific gravity of between 1.15 and 1.18.

F. W. Aycock (Proc. A. Ph. A., 1893, p. 409) remarks that "examination of many samples of powdered jalap confirms the often expressed opinion that the official standard of 12 per cent. of resinous constituents is too high."

Mr. Goff (Michigan Ph. Ass. Proc., 1898, p. 52) examined eight specimens of the drug, with the following results: 6.75 per cent., 8.36 per cent., 8.45 per cent., 9.44 per cent., 9.69 per cent., 8.44 per cent., 10.33 per cent., 8.08 per cent. of resin.

The author of the present paper, at the suggestion of Professor Kraemer, considered the following points in the valuation of this drug:

(1) Specific gravity; (2) assay; (3) quantitative microscopical estimation of crystals; (4) quantitative microscopical estimation of starch.

Two lots of jalap were taken, which for convenience we will call *A* and *B*; the tubers of *A* were broken open, and those light in color and starchy were separated from those dark in color and resinous.

The tubers of *B* were also broken open, but not separated.

The specific gravities of pieces of each lot were found to be as follows:

A.		B.
Starchy.	Resinous.	
1'131	1'346	1'274
1'186	1'358	1'282
1'102	1'348	1'267
1'131	1'345	1'281
1'298	1'371	1'284
1'157	1'380	1'330
1'264	1'352	1'363
1'176	1'365	7) 9'081
1'276	1'339	1'297 average.
1'198	1'352	
1'207	1'409	
1'210	11) 14'965	
12) 14'336	1'360 average.	
1'194 average.		

The tubers should be broken open before specific gravity is taken, for in some very large spaces were found.

The assay for resin, according to the method of the Pharmacopœia, resulted as follows:

A.		B.
Starchy.	Resinous.	
1'76 p.c. resin.	6'62 p.c. resin.	7'64 p.c. resin.

Crystals of calcium oxalate were estimated both in whole sections of the drug and in the powder. In the whole sections, crystals in the cortical layer only were counted, for most sections contained but few crystals scattered through the portion enclosed by endodermis.

The crystals are generally in rosette-shaped masses; occasionally, however, large cubical ones are seen. There are also present a very

small quantity of crystals of a carbohydrate in somewhat larger rounded masses than those of calcium oxalate. These carbohydrate crystals were not included in the estimation when it was possible to exclude them.

The sections were cleared by boiling in chloral-glycerin solution. Results are here appended:

A.
STARCHY TUBERS.

Specific Gravity.	Number of Crystal Masses	in Millimetres of Section.
1'131	260	2'5
1'264	71	7'5
1'176	80	5'
1'298	414	23'
Total	825	38'

In 1 millimetre there were about 17 crystals on the average found.

RESINOUS TUBERS.

Specific Gravity.	Number of Crystal Masses	in Millimetres in Length.
1'380	170	10
1'348	541	15
1'352	531	17
1'346	375	4
Total	1,617	46

In 1 millimetre there were 35 crystals of calcium oxalate on the average.

No.	A.		B.
	Starchy.	Resinous.	
1	68	99	90
2	75	98	105
3	84	180	104
4	86	129	110
5	103	125	129
6	112	5) 629	5) 538
	6) 528	125 to a mg.	107 to a mg.
	88 to a mg.		

The estimation of crystals in the powdered drug was conducted along lines recommended by Prof. Henry Kraemer (AMER. JOUR. PHARM., October, 1897.

The crystal masses were very often broken up and scattered.

The number of masses, whole or scattered, in each milligramme of the different lots are given in above table.

For the estimation of starch the drug was ground to No. 80 powder, and the examination was conducted along the same lines as the crystals, with some modifications.

After the chloral-glycerin solution was added, instead of heating, each portion was thoroughly mixed with the edge of the cover glass before it was laid on.

As in the crystal estimation, ten readings were made on each milligramme of powder, but in this instance the field of the high-power lens was taken instead of that of the low-power. That portion of the field which contained the greatest number of starch grains was found first with the low-power lens and then that point of this field in which the starch grains were most abundant was taken as the place for counting the grains with the high-power. In this connection the author wishes to state that in the field were included only such grains as were loose, or imbedded in tissue not more than two layers deep; tissues which contained such large quantities of starch as to make counting impossible were not included; in fact, were not permitted under the high-power lens.

The results of the readings are enumerated:

No.	A.		B.
	Starchy.	Resinous.	
1	328	108	146
2	346	127	200
3	341	181	185
4	431	149	176
5	357	150	183
6	338	129	5) 890
	6) 2,141	6) 844	178 to a mg.
	356.8 to a mg.	140 to a mg.	

On placing these facts together we have the following:

No.	Per Cent. Resin.	Specific Gravity.	Crystals to Milligramme.	Starch to Milligramme.
1	1.76	1.194	88	357
2	6.62	1.360	125	140
3	7.64	1.297	107	178

It is apparent, therefore:

(1) That the increase in specific gravity appears to be due more to the amount of crystals of calcium oxalate than resin.

(2) That the increase in crystals is accompanied by an increase in resin, though possibly not in corresponding proportion.

•(3) That, in the specimens of jalap examined, there is approximately an increase of 50 per cent. in crystals and a decrease of 50 per cent. in starch in those assaying 6.62 per cent. and 7.64 per cent. resin over that assaying 1.76 per cent., or, in other words, the two lots of better quality contained 50 per cent. more crystals and 50 per cent. less starch than jalap of poorer quality.

NOTES ON THE CULTURE OF DRUGS.

BY FREDERICK T. GORDON.

Belladonna.—The seeds of belladonna were supplied by Mr. Kilmer, of J. & J., and were, I believe, from selected English stock. These were planted on May 5th, and later, on May 14th, in beds of different soils and with varying amounts of sunshine and shade and water. The seeds first planted, for some reason, did not appear above ground, as plants of course, until well on towards the end of June; those planted later came up on June 18th as two tiny leaves much resembling beets.

These were allowed to remain in the original bed until 3 or 4 inches high and were then transplanted, which method, by the way, seems to give the best results; plants not transplanted did not grow nearly as well as those that were.

The soils were sandy loam, garden loam and loam with stable manure. Plants did best in loamy soil with manure, in a plot that had shade part of the day; those in sandy soil and exposed to the sun all day did not reach a good growth.

The net results at the end of three months (when the experiments had to be discontinued because of filling of the ground) were plants of sturdy growth from 18 to 30 inches high, large leaves of good color and appearance, roots about 10 to 17 inches long, some $\frac{3}{4}$ inch in circumference when green, drying to about half this size. I am firmly of the opinion that belladonna can be cultivated successfully in these latitudes with very little trouble and expense, and that the plant will in course of time become adapted to our soil and climate.

Hyoscyamus.—The seeds for hyoscyamus were from Mr. Lochman, of Bethlehem, Pa. They were planted at the same time as the belladonna, those planted on May 14th, only, coming up. The plants rapidly increased in size, and by the end of August were covered with large leaves and were in full bloom. I allowed some of them to remain and from these have secured quite a quantity of seed, the leaves drying up on the plant. The conditions as to soil, exposure, etc., were about the same as for belladonna, with the same results, only hyoscyamus seems to thrive much better than belladonna, the plants reaching maturity a month or so earlier. Hyoscyamus can be grown easily here, and will give good results as to leaves, root, etc.

Carthamus.—This plant, I am told, is now a common flower in up-State gardens; anyway, it flourished with me as if to the manor born, and the only trouble I had with it was to keep the flowers picked fast enough to permit of a new growth. On the average, from each flower I got 1 gramme of dried petals, etc., which yielded a fine yellow color to alcohol and water, water extracting the most of the coloring.

Aconite.—The seeds of aconite came through the Department of Agriculture. Unfortunately, not a single one rooted, and I could not get a result with any sort of soil or planting. I believe tubers will have to be planted to get any growth.

BISMUTH IN ORGANIC PREPARATIONS can only be determined, according to Gaebler (*Pharm. Zeit.*, 1900, p. 567), by rather distinct methods for each substance. In bismuth oxyiodogallate (airol) the bismuth is precipitated as oxalate; bismuth β -naphtholate (orphol) can be safely ignited and the bismuth determined; with bismuth salicylate, incineration, extraction of the residue with nitric acid and ignition is quite accurate; bismuth tri-bromphenol (xeroform) is treated with strong nitric acid, precipitated with ammonium carbonate and the precipitate converted into Bi_2O_3 .

RECENT LITERATURE RELATING TO PHARMACY.¹

THE CULTIVATION OF MEDICINAL PLANTS.

The most noteworthy thing that has transpired is the revival of interest in the subject of the cultivation of medicinal plants. It seems to become more and more recognized that the time is not far distant when we will be as dependent upon the agriculturist for medicinal plants and timber as we are to-day dependent upon him for our food products.

A valuable article on the cultivation of medicinal plants in Europe appeared in the *AMER. JOUR. PHARM.*, April, 1900. In an editorial in the same number the subject is further treated with its possibilities, as well as an enumeration of plants given which have been cultivated successfully in the United States. At the Richmond meeting of the A. Ph. A., the Chairman of the Scientific Section further called attention to the same subject, with the result that a committee was appointed to bring the matter of drug cultivation before the Secretary of Agriculture. It is also interesting to note the efforts of the Professor of Pharmacognosy in Michigan University in securing several acres of ground for the purpose of cultivating medicinal plants for purposes of research. All these events indicate not only an interest in the subject, but emphasize the fact that there is need for consideration of the matter. Twenty years ago there was just as much interest felt as to-day, only the exigencies of the situation were not felt. To-day, however, the gathering of medicinal plants is restricted to but certain portions of the South, and the reckless extermination without regard to future collections is making an impression upon those who utilize plant products for medicinal and economical purposes.

The cultivation of ginger has proved so remunerative in Jamaica that measures have been taken to cultivate the plant-yielding ginger in St. Lucia, Dominica and Barbadoes. In Samoa, it is said that kola and vanilla are being planted.

One of the most valuable practical books relative to growing plants is "The Cyclopædia of American Horticulture," to be pub-

¹This department contains a *résumé* of the work in botany and pharmacognosy during the past year, and is the substance of a report presented by Henry Kraemer, Chairman of the Committee on Botany of the Pennsylvania Pharmaceutical Association, June, 1900.

lished by the Macmillan Company, and edited by L. H. Bailey and W. Miller. This will undoubtedly be of value to those who are to engage in the cultivation of medicinal plants.

NEW PLANTS AND DRUGS.

Th. Peckolt is continuing his writings upon the medicinal and economical plants of Brazil in the *Berichte* of the German Pharmaceutical Society. Duyk, also, is continuing his investigations upon Mexican drugs (see *Bull. Soc. Pharm. Brux.*, XLIII, and *Bull. Comm.*, XXVIII). J. S. Ward has described some West African plants in *Pharm. Four.*, 1900. Several Indian plants have been examined by S. Camphuijjo (see *Nederl. Tijdschr. v. Pharm.*, 1899). The arrow poisons of Wagogos, according to Schellman, are obtained by boiling the bark of two trees of the N. O. Euphorbiacæ. *Pilocarpus racemosus*, of the French Antilles, is given by Rocher as a new source of jaborandi. The leaves contain 0.6 per cent. of pilocarpine and 0.4 per cent. of jaborine. David Hooper has shown that the ancient Eastern medicine, *Akakia*, is an astringent extract of an acacia.

Schumann has added to our knowledge of the kola exported between Senegal and Angola. All seeds are wrapped with the leaves of *Cola cordifolia*. The large seed (siguru) is obtained from *Cola vera*; whereas the small seed (kotofo) is the product of *C. acuminata*. The natives of Bali also employ the seeds of *C. lepidota* and *C. anomala*.

According to H. Moeller, *Rheum Franzembachii* does not furnish any of the commercial rhubarb. Ergot from rice grown by Indians in Northern Wisconsin has been examined by R. H. Denniston. The seeds of *Brucea Sumatrana* (N. O. Simambacæ) are used in China and India for dysentery. Heckel and Schlagdenhauffen find that they contain quassin and saponin; but Bertrand and Physalin believe that the activity is due to a glucoside, kosamin. Murcia lemons are entering the markets during the winter months. They are distinguished from Messina or Palermo lemons in possessing a smoother skin and cleaner appearance. A new rubber plant of Lagos (*Fantumina elastica*) is described by Stapf. *F. Africana* (syn. *Kicksia Africana*) does not appear to yield any rubber. *Catha edulis* contains, according to Schaer, large quantities of caoutchouc, an ethereal oil, alkaloid and tannin. Large edible

tubers called native yams are yielded by *Parsonia paddisoni* (N. O. Apocynaceæ). Piralaby rubber is the product of *Landolphia perieri*, H. Jumelle, of Madagascar. Altamasano has extracted from Coniza, one of the Mexican Compositæ, a glucoside, called lennesine.

In Merck's Annual Report for 1899 the following new drugs are described: (1) Folia Mayteni Vitis Idæi; (2) Folia Combreti Raimbaulti; (3) Fructus Prosopis strombuliferæ; (4) Herba et Radix Brachycladi Stuckerti; (5) Herba et Fructus Blepharis Capensis; (6) Natri (several species of Solanum); (7) Radix Tachix Guyanensis; (8) Semen Bondue (the seeds of *Guilandina Bonducella* and *Cæsalpinia Bonducella*).

INVESTIGATIONS ON OTHER DRUGS.

Collin has prepared in the *Four. Pharm. Chim.* an interesting article on the anatomy of fictitious teas, such as "Kaporie," "Caucasus," etc. In the same journal and by the same author is an illustrated paper on *Hydrastis Canadensis*, L. This is admixed with *Cypripedium parviflorum* and *Stylophorum diphyllum*. The morphology and anatomy of the Japanese lacquer tree (*Rhus vernicifera*) is described in *Abhandlung. d. Senckenbergische naturforsch. Gesellschaft*. In the Bulletin Iowa Agric. College is given by Pammell the geographical distribution of *Solanum Carolinense*. Grace E. Cooley has shown that in the autumn leaves of Hamamelis (which contain most tannin) the walls of the hairs are thickened and colored yellow. Several species of Polygala (*P. violacea*, St. Hil., and *P. caræasana*, H. B. K.) have been found by Dethan in commercial ipecac. Small jaborandi leaves have been utilized as an adulterant in coca. Greenish has described a new spurious senna, while Micko has described a false cinnamon bark.

PLANT CONSTITUENTS.

There has been the usual activity among investigators during the past year in ascertaining the origin as well as nature of the constituents of drugs and economical plants. Hesse has contributed a valuable paper on the *Solanaceous alkaloids*. The active principles of hyoscyamus are chiefly hyoscyamin with some atropin and hyoscin; belladonna root contains an excess of atropine; scopolia rhizome contains chiefly hyoscin and some atosin, both of these bases being present in commercial scopolamin. It appears that

the alkaloids in scopolia are more constant in quality and quantity than those found in either the leaf or root of belladonna.

In an investigation of the various commercial rhubarbs Hesse finds that *Chinese rhubarb* contains chrysophanic acid, emodin, rhabarberon and rhein; Austrian rhubarb (*R. rhaponticum*) and English rhubarb (*R. palmatum*) contain chrysophanic acid and rhapontin; *Rumex nepalensis* and *R. palustris* contain chrysophanic acid and nepodin; *Rumex obtusifolia* contains chrysophanic acid, nepodin and lapodin.

Tschirch holds that the emodin of aloes and frangula is isomeric and that they can be distinguished by certain color reactions as well as other tests, as shown by Oesterle. Tschirch further holds that all methylantraquinone derivatives containing one or more oxy-groups are purgative. The emodins (being tri-oxy compounds) seem to be most active, and it appears that these oxy-derivatives of methylantraquinone will eventually replace the drugs themselves.

The following alkaloids are present, according to H. A. D. Jowett, in *Jaborandi*: Pilocarpine, iso-pilocarpine (pilocarpidine of Petit and Polonowski), pilocarpidine (Harnack and Merck). Commercial jaborine appears to be a mixture of these three alkaloids, and does not appear to be present in jaborandi leaves. According to Wentzel the alkaloid in mandragora root is hyoscine ($C_{17}H_{19}NO_3$). Reeb finds in wall-flower a principle resembling digitalis in its physiological action (cheiranthin), and in the seeds an alkaloid (cheirinine) resembling quinine in its properties. Various species of Lupines have been again investigated, this time by J. Callsen, who did not succeed in isolating any other alkaloids than those already known from the seeds of blue and perennial lupines. The active principles of cusco have been investigated by Kondaker and Schatz. Kiliani has continued his investigations upon the active principles in digitalis. The active principle in capsicum has been further investigated by Micko, who insists that it is odorless, and that the vanilla-like odor ascribed to it by Mörbitz is due to the action of reagents employed. An emetic principle (melonemetine) has been isolated by Herberger from melon root and other Cucurbitaceæ. The toxic effect of tobacco smoke is ascribed by Thoms to a phenol-like body resembling creosote. A new oily alkaloid ($C_9H_{18}NO$) miscible with water has been found by A. Piccinni in pomegranate bark. J.

Thomann considers that the daturine in the seeds of *Datura stramonium*, L., is in the nature of a reserve product. The flowers of *Datura alba* contain hyoscyne, and Hesse considers that it may supersede the mixture known as scopolamine salt. Investigations seem to show that there is no caffeine in the leaves of any species of *Psathura* (N. O. Rubiaceæ). H. A. Martin has contributed a paper on the history of quinine and the barks yielding quinine. Pommerhue has made a number of crystalline compounds of the alkaloid (damascenin) extracted by Schneider from *Nigella damascena*. H. Meyer has found that anemonin forms compounds of the maleic and fumaric types. According to Hausman, aspidin is found in *Aspidium spinulosum*, whereas filicic acid is present in *A. filix-mas* and *Athyrium filix-fœmina*. A crystalline, non-glucosidal principle (gossypol) obtained from cotton seeds has been examined by Marchlewski. The bitter principle of *Plumiera lancifolia*, investigated by Boorsma and Merck with discordant results, is shown by Franchemont to vary in its melting point according to the amount of water of crystallization that it possesses.

Houdas has been studying the glucosidal principle in ivy. According to L ger, nataloin and homonataloin give a green coloration with sulphuric acid and manganese dioxide or potassium dichromate, and a violet color with a solution of soda containing ammonium-persulphate. The investigations of Busse indicate that in unripe vanilla fruit there exists a glucoside which, on treatment with ferments (emulsin) or mineral acids, yields vanillin. According to Aweng there are two groups of cathartic glucosides in frangula, the primary glucosides being best suited for liquid preparations.

The arrow poison of Wakamba (German East Africa) appears to be a glucoside, and resembles Arnaud's ouabain. S. E. Boorsma has extracted Curangin (the glucoside of *Curanga amara*) from the *Scrophulaneæ* by means of ethyl alcohol. According to the investigations of Hilger, while the coloring principle of saffron is a glucoside, the glucoside picrocrocine (or saffron bitter) is really a mixture of coloring principles, one of which resembles carotin.

Malabar kino has been shown by David Hooper to possess in dry substance over 90 per cent. of tannin. *Hymenea coubaril* contains 23.8 per cent. catechutannic acid and 2.7 per cent. catechin. A. G. Perkin has been continuing his studies on the tannin and coloring principles in a number of plants. A yellow coloring principle has

been isolated by Adrian and Trillat from the digitalin obtained from *Digitalis lutea*. The authors believe it to be different from the digito-flavone of Fleischer. The green and red pigments of *Amanita muscaria* have been subjected to a chemical examination by A. B. Griffiths. A. Nestler believes that the change in color on ripening of juniper berries is due to the presence of a fungus.

The investigations of Charabot on the formation of lavender oil seem to indicate that the oil in flower buds and mature flower is richer in esters, whereas in the withered flowers the alcohols preponderate. The origin of the oil cells in *Cinnamomum cassia* has been described in *Festschrift f. Schwendener*, 1899. According to G. Spampani, the oil in olive is produced especially in the cells of the mesocarp during the activity of the protoplasm and not on account of the degeneration of the latter. The paper of van Romburgh in *Ann. Jard. Bot. Buitenzorg*, 1899, shows further the widespread distribution of methyl salicylate and hydrocyanic acid in the vegetable kingdom.

The malic acid in the berries of *Hippophæ rhamnoides* is identical with the acid in *Pyrus aucuparia*. Greshoff has investigated Pisang wax, the product of an unknown plant of Lower India. The carbohydrates of tragacanth have been reinvestigated by Widstoc and Tollens. Xylose was obtained from the white and arabinose from the brown varieties, respectively. Dulcite, and not mannite, has been found by Hoehnel in *Euonymus atropurpureus*. The same carbohydrate is present in *E. Europæus*.

According to J. Grüss, the enzyme in *Penicillium glaucum* acts less powerfully on starch or reserve cellulose, but more energetically on cane sugar, than malt diastase. Seminase, the ferment of leguminous seeds possessing a horny albumen, differs from malt diastase in that its action is less active on starch, but more active on albumen of the locust bean than diastase. An enzyme (hadromose) has been found by Marshall Ward in the fungi (*Pleurotus pulmonarius* and *Merulius lachrymans*) which destroy the liquefied cells of timbers.

COMMERCE AND STATISTICS OF DRUGS.

At one of the meetings of the Pharmaceutical Society in London Mr. Holmes read a paper on "The Commerce of Drugs," in which he treats more especially of strophanthus, aconite root, Pareira brava, scammony, saffron and pilocarpus. This, with the interest-

ing discussion, will be found printed in the *Pharmaceutical Journal*, 1900, pp. 278 and 283.

The total output of cinchona bark from Java during 1898 amounted to 11,150,000 Amsterdam pounds. Besides this, 500,000 ounces of quinine sulphate were manufactured in Java during the same period.

Consul Clennel does not regard the diminished importation of opium at Wuhu during the past few years, as compared with the years 1885-1895, as indicating the lessening in the prevalence of the opium habit, but rather as a sign that the opium grown locally is supplanting that imported from outside provinces, the importations of opium having been in recent years but slightly over 200,000 pounds; as compared to 600,000 some years ago.

The fact that the trade in licorice root from Aleppo, Turkey, in 1899, has decreased 6,616 tons in amount and 40,966 *l.* in value is accounted for by the *Chemist and Druggist* by the fact that American buyers of last year postponed the shipment of part of their goods until the spring of 1900. The importation of licorice root into Marseilles is now 1,436 tons annually and has been steadily increasing during the past six years.

BOTANICAL NOMENCLATURE.

A number of papers upon the subject of botanical nomenclature have appeared in *Proc. Linnæan Soc.*, *Botanical Gazette* and *Bulletin of Torrey Botanical Club* during the past year. The most noteworthy is that of Dr. Kuntze, who argues for the adoption of 1737 as the starting point for generic names in botany, and 1753 for specific names, with the future exclusion of all publications between Linnæus's *Genera Plantarum* of the former date and his *Species Plantarum* of the latter date.

SOME NEW BOOKS.

The last volume of the "Flora of Ceylon," which work was commenced by Henry Trimen in 1893, and continued since the death of the latter by Sir J. D. Hooker, has been published during the past year. This concluding volume contains a key to the orders, genera and aberrant species of the flowering plants of Ceylon, besides other information relating to the species. There are also comprehensive indices to the entire work.

The second edition of Wiesner's "Die Rohstoffe des Pflanzenreichs" has been begun and is coming out in parts. The book is to be revised by Prof. Julius Wiesner, with the assistance of a number of botanists, chemists and others.

A. Meyer and K. Schumann are continuing the publication of the new edition of Berg and Schmidt's "Atlas der officinellen Pflanzen." The work of Engler and Prantl, "Die natürlichen Pflanzenfamilien," is appearing in parts as heretofore.

Several works have been published by American authors: "Morphology and Histology of Plants," by H. H. Rusby and S. E. Jelliffe; "Microscopy and Micro-Technique," by A. Schneider; and the second edition of Sayres' "Manual of Organic Materia Medica and Pharmacognosy," which contains a section on histology and micro-technique, by Wm. C. Stevens.

Several pharmacognostical works have also appeared abroad, the most important being another Lieferung of Oesterle and Tschirch's "Anatomischer Atlas der Pharmakognosie und Nahrungsmittelkunde." L. Braemer and A. Sins have also issued an "Atlas de Photomicrographie des Plantes Medicinales." A work upon "Die Mikroskopische Analyse der Drogenpulver," by Ludwig Koch, is also appearing in parts.

THE YEAR'S ADVANCE IN TECHNICAL CHEMISTRY.¹

BY ALBERT W. SMITH.

The year just passed has been perhaps the most important of the whole century in the advance made in all manufacturing industries, especially those having a chemical basis. This advance has been brought about, in a few instances, by the application of radically new methods, but more often by a wonderful enlargement of the scale of operations of well-tried processes, and by the general introduction of automatic mechanical devices and labor-saving machinery. Everywhere the striving for increased tonnage and for getting the very largest possible yield out of each piece of apparatus employed has been more intense than ever before.

Considering first the industry which is of greatest commercial and economical importance in the United States, the metallurgy of iron

¹Amer. Chem. Jour., 1900, p. 520.

and steel, the most striking change is the practical doubling in capacity of most of the newly-designed blast-furnaces. The daily output of the coming furnace must approach 600 tons of pig metal, while the maximum for most furnaces heretofore has been a daily average of from 200–300 tons. When we consider that only a decade ago an output of 100–150 tons daily was considered good practice, we can appreciate the magnitude of the change and wonder where the limit of the future is to be. The greater part of this increase has been caused by doubling, or more than doubling, blast pressures and blast quantity, thereby increasing the yield of existing furnaces and rendering possible larger hearth diameters.

A considerable increase of economy in the use of fuel for making pig iron seems to have been accomplished abroad by the direct use of furnace gases in gas motors for producing the air blast, instead of burning this gas to generate steam and using steam engines to operate the blast pumps. The solution of this problem is cause for congratulation, because of the numerous difficulties connected with it. The gas from iron furnaces available for such motors contains only about 25 per cent. of carbonic oxide, as almost its whole source of heat value, besides carrying large quantities of fine dust of coke, ore, etc., which greatly increases the difficulty of use in any mechanism where corrosion must be avoided. Any one who has seen the valves of a hot-blast stove cut through and worn out in a few months by the action of this dust will appreciate its cutting power.

In Scotland, furnaces using raw coal have made as a by-product about a tenth of all the ammonia produced in Great Britain during the year. Certain localities in the United States possessing abundant non-coking coal in proximity to cheap and good ore might profitably adopt this method of iron manufacture, notably the new Michigan coal district of the Saginaw Valley, which, by this means, could easily supply the whole of the iron used in Michigan districts and all of the ammonia needed in the newly developing alkali industries of that locality.

Another important factor in the great increase of furnace capacity for the production of pig iron has been the installation of automatic labor-saving devices for handling furnace charges and removing furnace products. The most important of these are the car and ore-loading machines of Brown, McMyler, Lindsey and Hulett, the

casting machine of Uehling for handling the metal, and the various methods for carrying charges to the furnace top, with automatic dumping and distributing devices. These latter have removed the necessity for charging men or any laborers continuously at the charging level, where the work is exhausting and dangerous. By the use of a double bell they effect a thorough mixture of the charge and prevent the loss of furnace gases.

The successful conversion of blast furnace slag into a fair quality of hydraulic cement at a number of furnaces is a long step toward the economical solution of the troublesome problem of the disposal of this vast by-product. It has been found that certain grades of basic slag in which the proportion of magnesia and sulphur is not too high, by simply being granulated with water as they flow from the furnace, ground extremely fine and intimately mixed with the proper proportion of lime, are converted into a hydraulic cement which forms a cheap and, under certain conditions, an excellent substitute for Portland cement, and for which a permanent demand has been created.

In the production of steel the gap between the cost of producing Bessemer and open-hearth metal has been further lessened, mainly by the general introduction of basic open-hearth furnaces of greatly increased capacity and of labor-saving devices in charging metal and fluxes. Most important of these latter is the charging machine of Wellman. In this connection, too, the large introduction of the Wellman tilting open-hearth furnace during 1899 is worthy of mention, and a probable further economy of operation will be secured by their use. Several large plants using these tilting furnaces have been installed during the past year, and, while they have been used in a number of places heretofore, the record of their efficiency has not as yet been made public and is awaited with great interest. While their cost of construction is about 25 per cent. more than that of the older stationary type, the complete removal of all metal and slag from the furnace hearth at each operation, with the resulting saving of metal, the saving of the time necessary for tapping, the small amount of repair necessary to the bed after the removal of each charge, and the facility with which this can be accomplished are factors which will probably cause this to become the standard type of steel furnace of this decade.

In Bessemer practice the most noticeable improvement is the

general introduction of the Jones mixer for receiving the molten pig metal direct from the furnace, thus saving its contained heat and doing away with cupolas for melting the iron previous to its treatment in the converter. This method effects not only a saving in heat or fuel, but a greater gain in the cost of handling the iron. It has been found that only about one laborer in a hundred can endure the strain of continuously handling the heavy pigs of metal at the blast furnace in their removal from the sand moulds and loading on cars. The doing away with this severe labor by the direct use of hot metal in the Bessemer plant and by the use of the Uehling casting machine seems, therefore, a gain to humanity as well as in the money value saved. The basic converter still fails to gain a permanent foothold in this country, and, because of our immense deposits of pure ore and beds of phosphate rock, and of the continued encroachments of the open-hearth process, probably never will.

The metallurgy of copper has undergone changes similar to those of iron, only in a much smaller degree. The most important of these are the increased use of the Bessemer converter in refining mattes, and an increased output of electrolytically refined metal. The general use of a gold-bearing material as a lining for the converter in matte Bessemerizing has effected a material economy. In roasters for copper sulphide ores, several new devices have gained general use. A Denver-made modification of the old Spence furnace, with its numerous beds and automatic plow rakes, in which the operating chains are placed upon the exterior of the hearth, and the Herreshoff furnace, consisting of a vertical cylinder with horizontal diaphragms or beds and rakes operated by a central shaft, have perhaps received the largest installment during the year. A plant of considerable size to operate the Hoepfner process of refining copper has been in operation for some time, but reliable cost data are not at hand. This process depends upon dissolving the oxidized metals with cupric chloride and electrolyzing the chloride solution. The process was tried at the Brooklyn experimental plant of a copper-nickel refining company some years ago, but was abandoned.

In the metallurgy of nickel the principal event has been the installation in England of a considerable plant to use the Mond process of refining by carbonic oxide, and of a plant in this country

utilizing a new but unpublished process. Storer's method proposed, but not yet installed on a commercial basis, applies the old Hunt and Douglass copper method to nickel ores, treating nickel oxide at high temperature with a strong solution of ferrous chloride.

In the treatment of lead, tin, silver, mercury and zinc ores, changes during the year seem to have been unimportant. Several methods have been proposed for treating the low-grade argentiferous blende-galena ores, so common in Colorado, but none has as yet stood the test of successful commercial application.

The output of gold has been further increased by the installation of many new cyanide works, much of the material treated in these mills being the tailings from old amalgamation plants or of abandoned dump heaps. Electrolyzing the cyanide solutions in this process is becoming more common. The Sulman-Teed method of adding a small quantity of cyanogen bromide to the lixiviating solution is claimed to effect increased gold extraction, especially in arsenic-bearing ores, but it is also asserted by many that the loss of cyanogen by this method is too great for success, and more time must be allowed for further evidence. A method of assisting the free access of the oxygen probably necessary to the solution of gold by cyanide solutions, which consists in violently agitating the ore with the solution by means of air introduced into the mixture, under considerable pressure, has been patented and is now being largely advertised under the name of the "Pneumatic Process." A possible serious objection to the use of this method is that an increased loss of cyanide may occur from excessive oxidation and decomposition by carbonic dioxide. During the years immediately following the marked success of the cyanide process in South Africa, the tendency was to introduce this method for all sorts of ores and under all sorts of conditions, whether adapted to success in this way or not. Now the proper limitations of the use of cyanide solutions are better understood, and the chlorination process is again receiving more attention, so that the two methods are now beginning to assume their proper and normal relation to each other. Increasing amounts of gold and silver are being recovered by matting the ores with copper- and sulphur-bearing material, Bessemerizing this matte to blister copper, and electrolyzing the product.

In several industries the year has been marked by the beginning of that vast shifting of location from coal to water-power situations

which is to mark the coming decade. In several cases this shifting has already been nearly completed, notably in the production of chlorate. Norway, Scotland, Switzerland and the mountain regions of France and the United States, where waterfalls abound, are destined to become centres of manufacturing activities fully as great in many industries as the older coal localities, and with the advantage that the coal fields once exhausted are gone forever, while water powers last for all time. This recent great development of the uses of water-power is due to new electrolytic processes, to material improvements in the transmission of high-tension currents, to improvements of dynamos, and to the development of water turbines to utilize extreme pressures. This transference of many old industries to water-power districts will be limited only by the cost of carriage of the raw material to the plant, and of the finished product to its market. The competition with coal-generated power thus occasioned must result in a more and more economical use of fuel, and the year has shown material progress here. The previously mentioned use of blast furnace gases in gas motors is of this nature, but the very large year's increase of by-product coke-oven plants is of greater significance. In America new ovens of the Semet-Solvay or the Hoffman type have been started during the year at Halifax, Boston, Glassport, Pa., Benwood, W. Va., and Ensley, Ala. This is a satisfactory improvement, because the wasteful use of coal in bee-hive ovens will always remain a reproach of the nineteenth century, especially in American and English practice. These by-product coke ovens effect an increase of from 10 to 15 per cent. in the amount of coke produced, with a saving of 3-4 per cent. of the weight of coal tar, 0.4-0.8 per cent. ammonium sulphate, and 7-10 per cent. gas in excess of that required for coking. These last three items almost equal in value the coke produced.

The skill and care required in operating the Mond gas producer, considerable fluctuations in the price of tar and ammonia, and the high cost of construction and depreciation of plant have restricted the introduction of this most valuable invention to a few localities, but a number of such plants have been started during the year and with considerable success. Probably the most important progress in the use of fuel, and our greatest present hope of delivery from the smoke domination in soft coal districts, lies in the success of the Dellwick water-gas process which the past year has shown. In this

device the fuel is burned directly to carbonic dioxide during the heating, or air blast period, by using extra high blast pressure, and skilfully distributing its contact with the fuel. This increases the gas yield by nearly 100 per cent., and reduces the total loss of the heat value of the fuel from 55 to only 18 per cent. During the past year a plant has been installed in Pittsburg for the conversion of coal into fuel gas, utilizing a radically new method, which also bids fair to solve this important fuel question, and the result of this experiment is awaited with intense interest.

In many instances, where petroleum has been used as fuel, its recent increased cost has forced its abandonment. This has made the discovery of an equally convenient and efficient fuel a great desideratum. Fortunately such a substitute for oil has been found in the use of finely-powdered bituminous coal, injected into the furnace with an air blast just as oil is used. The coal is thoroughly dried and ground very fine. Its only drawback seems to be almost explosive combustibility, rendering its storage unsafe. The temperature attainable by this means seems to be almost equal to that with oil, and in respect to cost and some other considerations it is more advantageous.

During the year a wonderful growth in the manufacture of Portland cement has taken place in the United States, so that within the coming decade we may reasonably expect to supply all of the home consumption and probably a great part of that used in other countries. The principal improvement in methods has been the general introduction of the automatic rotary kiln or burning furnace. These consist of inclined steel cylindrical shells, about 60 feet long, mounted on rolls and lined with magnesia brick. The cement mixture is pumped with water or fed dry by a screw into the upper end and falls out as burned clinkers continuously at the lower end. The fuel used is oil, gas, or powdered coal, the process is continuous and requires a minimum of manual labor. The success of this invention, which has been brought about commercially in the United States first, has been so pronounced that American experts have been called to the oldest and best cement-producing districts in the world to reconstruct their plants on the new lines.

In the manufacture of sulphuric acid, 1899 has seen the successful beginning of the greatest revolution since this acid began to be produced on a large scale, namely, the production of sulphuric trioxide,

SO₃, by the contact power of finely-divided platinum on a mixture of sulphurous oxide and air. This reaction was long ago discovered by Winkler and utilized for making dry sulphuric trioxide and fuming acid, but the heat produced soon checked the reaction, and the converting power of the platinum soon gave out. The experts of the Badische Anilin and Soda Manufacturing Company, a few years ago, discovered the cause of the latter trouble to be the presence of dust and foreign gases, principally arsenic and phosphorus compounds, and much moisture. By using purified gas and providing a way of escape for the excess of heat generated by the reaction, the process became quantitative, even with dilute sulphurous anhydride, and hence commercially possible for making all kinds of sulphuric acid. Many German acid makers are reported to be rapidly eliminating their lead chambers and using platinized asbestos or pumice-stone instead. The new method is especially economical for the strongest acids, the stronger the acid to be made the greater the economy over the nitre method. Weaker acids, up to chamber acid strength, are probably still made much more cheaply by present methods. The new process is best also for making the purer grades, for, by using pure sulphurous gas, chemically pure acid can be made as cheaply as any other.

The latest antagonist by which the old salt-cake and muriatic acid soda and bleach industry has been assailed, namely, the electrolytic process of chlorine and soda production, has, during the past year, developed into such a giant that, with its older competitor, the ammonia-soda process ever enlarging, the death of the LeBlanc process cannot be postponed many years. Only in Great Britain does the process, by virtue of the retaining energy of immense capital invested, survive to any considerable extent. On the European continent ammonia soda had practically expelled it without the assistance of electrolytic methods. In this country it never had a foothold. In England it has survived mainly because of the profit on the chlorine industries. Now electrolytic methods have removed this last prop, producing bleach as cheaply as the value of the hydrochloric acid used in the older processes. No competition is really ever likely to exist between the ammonia soda and electrolytic processes, because the soda produced by electrolysis is of little worth compared with the value of the halogen. The electrolytic production from salt of all the bleach used would produce only an

eighth of the soda required for the world's consumption. There is even some possibility that hydrochloric acid may be made eventually by uniting electrolytic chlorine and hydrogen. The principal electrolytic processes so far successfully installed are the Kastner-Kellner mercury method, with large plants at Niagara Falls and in England, the Hargreaves-Bird process, using an asbestos diaphragm, with a considerable plant at Liverpool, and the large works at Leopoldschall. The plant at Rumford Falls, Me., using platinum electrodes, went out of operation during the year. Probably the momentum of large capital invested in the chamber acid plants and in the LeBlanc soda process will maintain for both a more or less profitable existence for a number of years to come, in spite of all competition.

The great change in the chlorate industry has already been referred to. Practically all that in use is now made by electrolysis. There has been a marked decrease during the year in American imports of chlorate, soda and caustic, due to the installation of large ammonia-soda works at Syracuse, Detroit and Bay City, and another large works is now under construction at Barberton.

The manufacture of calcium carbide has grown during the year to immense proportions, but with a maintenance of prices, showing a large increase in its use. In Germany nearly all of the railway coaches are now lighted by a mixture of one-third acetylene and two-thirds Pintsch gas, resulting in both an increase of light and decrease of cost.

Another product of the electrical arc furnace which has been largely manufactured during the past year and has found an even larger demand is graphitized electrolytic carbons. It is found that when ordinary pressed carbons are packed in charcoal and placed in the path of a large electrical current so as to be intensely heated for a considerable time, the carbon of which they are composed is practically converted into graphite. Such graphitized carbons, owing to the uniform texture which they are given, and to the higher power to resist oxidation, are found to have two or three times the life of ordinary carbons for all electrolytic purposes, and their use is rapidly growing.

In the manufacture of wood spirits a greater purity of product has been brought about by greater care in fractioning. Also many new externally heated retort plants are replacing old kiln-furnaces

with internal firing for making charcoal, and greater economy is being attained in acetate production.

In the way of rubber products, the new substitute, Reid's "velvрил," is claimed to have had a successful year's trial in England, and to have gained a large use. Velvрил is a drying oil which has been nitrated, mixed by a common solvent with nitrocellulose, and the solvent subsequently removed. Castor oil is said to be used, and, after nitration, contains 4-5 per cent. of nitrogen. This, with nitrocellulose, forms a clear, homogeneous, rubber-like mass, its hardness being wholly under control by varying the relative proportions of the two ingredients, from a consistency like vulcanite to that of the softest rubber. The article to be made may be shaped from the mixture while softened by a solvent, or formed into shape by high pressure and heat somewhat above 100° C. In spite of its nitrated character it is not explosive, but burns slowly and quietly. Numerous uses are claimed for the new compound by its inventors, including insulating material, clothing, belting, varnish, paint, enamelling of leather, cement for wood, glass, metal, etc., hose and tubing, and even as a modifier of the explosive rate and power of guncotton and nitroglycerin. If only a small proportion of these claims stand the test of continued use, a most valuable discovery has been made, and a substance of the widest applicability and use found at an exceedingly opportune time, because of the enormously increased demand for rubber in so many industries.

Not even a few of the inventions and processes described above were actually begun or perfected during 1899, but all for the first time last year stood the test of continued practical use. Inventions almost without number are recorded every year, but it would take an omnipotent judge to select those that are destined to work industrial revolutions, and their description or bare enumeration would be of little interest and less value here. The record given has, therefore, been confined to those inventions and changes which the year has recorded as of permanent value, and which have proved themselves commercially successful.

SALICYLIC ACID IN PRESENCE OF CITRIC ACID may be determined, according to Jorissen, as follows: 10 c.c. of the liquid are mixed with four drops of a solution (10 per cent.) of potassium or sodium nitrite, four drops of acetic acid and one drop of a solution (10 per cent.) of copper sulphate. The mixture is heated to the boiling point, and if salicylic acid is present a blood red color is produced.

EDITORIAL.

MEMORIALS.

The unveiling of the monument to Pelletier and Caventou at the recent International Pharmaceutical Congress in Paris suggests several thoughts to American pharmacists at this time. In 1902 the American Pharmaceutical Association will celebrate its fiftieth anniversary, and a few years ago it was proposed by Albert E. Ebert, Chicago, that something be done by that Association (see Proc., 1899, p. 115) to revive the memory of Prof. William Procter, Jr. It is not too early to consider what form of a memorial will be most appropriate, and which will do the most good in not only reviving the memory of Professor Procter, but more particularly in benefiting the living. The question arises, who of the living are to be benefited? Is pharmacy to be lifted from its unpretentious position to become more intimately associated with the arts and sciences? Are the schoolboy and he who finds pleasure among the monuments of our parks and cities to be thrilled with the silent influence of a faithful life? Is it the student in pharmacy who is seeking a more liberal education, but whose pecuniary position is such that he is either debarred from, or seriously handicapped in, attaining his highest goal and noblest aim?

I. It is very probable that a memorial in the nature of a monument, with its attendant ceremonies, would be for the public in the nature of a flame, that would grow on, and with the increase in years become stronger and brighter, illuminating the apothecary's shop and making the public recognize the debt of gratitude that is due him, through all these years, for his unselfish labors and his helping hand that is extended at all hours and at all times. All of us feel more or less of the silent but perpetual influence of monuments. Bunker Hill monument in Boston, the Grant tomb in New York City, as well as the smaller monuments commemorating important historical events, or the records of the world's great men, scattered in not only large cities, but in every town and hamlet, are the inspiration of us all, particularly if we know the history of the event, or the record of the life thus perpetuated. Monuments may be looked upon as among the greatest educational influences of the civilized world. They are educational influences of the very best character, not only embodying and preserving man's noblest ideals and highest pur-

poses, but also inspiring and encouraging the humblest to hope for the most, and to persevere in spite of all conditions and circumstances. Monuments furthermore serve as a kind of connecting link between all the avocations and vocations of men. The liberator of the oppressed stands with him who has mitigated the ravage of disease. The poet or painter, with his inspiring creations, stands with the mechanic or business man who has increased the comforts of life, or with the philanthropist who through his benevolence has established homes, hospitals and asylums. Monuments in imperishable bronze serve the double purpose of elevating the calling to which they are dedicated, as well as of inspiring the race.

Pharmacy occupies a peculiar position at present. She is about to emerge from the obscurity of the past into the light of the present, and receive the just recognition that is due her. Her administrators are mixing more with the outside world, and taking very active interest in public and benevolent as well as municipal affairs, and they are showing that they may be unselfish in not only the apparently insignificant but important work of the retail pharmacist, but in affairs which concern the city and State. Monuments representing achievements in pharmaceutical investigation or perpetuating the memory of distinguished representatives of this art would serve additionally to impress upon the public their relationship to the apothecary and raise pharmacy to its proper place among the arts and sciences.

II. Scholarships and fellowships are in the nature of memorials, which may be looked upon as being more businesslike in their conceptions and operations. Like hospitals and other benevolent institutions, they are most appreciated by those who have most need of them. Scholarships and fellowships in commemoration of events or the lives of individuals serve to perpetuate the incidents of the former or the memory of the latter. They are like family heirlooms, without the sacred tie of blood and inheritance. The individual who benefits from the use of scholarships and fellowships may be inspired to do a great work and may be grateful for the opportunities afforded, but more generally he recognizes the hand and not the heart, appreciates the help received, but neither the motive of the donor nor of the friends who mean to do something that shall be in the nature of a memorial. Scholarships and fellowships are not sentimental products; they are, in some respects, infinitely more. They become

principals to associations and colleges; indeed, they serve the purpose of endowment. They benefit continually, as a rule, the poor and deserving student. They are the means at the command of the investigator and professional man, whose labors enlighten the world. They contribute to institutions of learning what is most needed, viz., means to enable those whom fortune has not smiled upon to prosecute intellectual pursuits; they do for the world infinitely more good in providing means for intellectual pursuits by those who are to be its savants and contributors to science than is possible probably from any other form of memorial. Apparently, however, they do not so much emblazon the memory of those in whose honor they are created as monuments, but who can question their real value in furthering the cause of progress and enlightenment? The name of some great man or woman is necessary, as a rule, to create a sentiment for raising funds to be used in the establishment of fellowships and scholarships.

III. Medals have also been recognized as a form of memorial in which the recipient carries with him the face of him who is thus commemorated. This is probably the most inefficient form of memorial. As a tribute of friends to the living medals are peculiarly appropriate, but as tributes of friends or associations, commemorating acts of those who have departed, they are singularly devoid of power in the world at large or even to the donor. In some places medals may have some significance. But the greater the man, the less the disposition to display medals and the more likely is he to forget that he even possesses them, as we recall that Bunsen had frequently to be reminded to wear the medals which had been showered upon him by learned societies and institutions from all over the world.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

DIE MIKROSKOPISCHE ANALYSE DER DROGENPULVER. Ein Atlas für Apotheker, Drogisten und Studierende der Pharmacie von Dr. Ludwig Koch. Erster Band: Die Rinden und Hölzer. 2. Lieferung. Leipzig: Verlag von Gebrüder Borntraeger. 1900. Preis, 3 Mrk. 50 Pf.

The present fascicle contains descriptions of the following barks: *Cinnamomi chinensis*, *Citri fructus*, *Condurango*, *Frangulæ* and *Granati*.

The author gives the characteristics in powders that are fine (Sieve No. VI), middle fine (Sieve No. V) and coarse (Sieve No. IV). The treatment of each drug is of the more abundant tissues, the seldomer occurring tissues and the diagnostic and important cells with their contents, and, finally, the preparation of the powder for examination. Numerous accurate plate illustrations accompany the work and serve to make it a valuable contribution to scientific and practical pharmacognosy.

COLLECTIONS FOR AN ESSAY TOWARDS A MATERIA MEDICA OF THE UNITED STATES. By Benjamin Smith Barton. Philadelphia, 1798 and 1804. With biography and portrait.

The Lloyd Brothers have been for some time considering the advisability of utilizing a number of the rare works on the shelves of the Lloyd Library of Pharmacy and Botany, in a manner that will conserve the interests of scientific societies and libraries. The plan adopted by them is to publish, in as nearly fac-simile as possible, the rarest of the early works connected with pharmacy, materia medica and botany, and to supply them by exchange to journals and societies connected with these branches of science, and also at the nominal price of \$1.00 per issue to persons who desire them for their private libraries.

The first of this reproduction series is work by Benjamin Smith Barton, which is recognized as the first English attempt at a materia medica of American plants. In this reproduction the Lloyd Brothers have also added as an introduction an excellent portrait and a biography of this author. This is an unusual opportunity for libraries and others to obtain fac-similes of these old but invaluable historical reference books at a price that is unusually reasonable. The members of scientific societies and libraries and scientists generally will appreciate the thoughtfulness upon the part of the Lloyd Brothers and will look forward to the reproduction of Peter Smith's Dispensatory, only one copy of which is known to exist, which is promised in the second bulletin.

THE ART OF DISPENSING. A Treatise on the Methods and Processes Involved in Compounding Medical Prescriptions. Sixth edition, revised and enlarged by Peter MacEwan. Published at the offices of the *Chemist and Druggist*, 42 Cannon Street, London, E. C. 1900.

This valuable symposium on the art of dispensing has been entirely recast and has been increased from 288 pages to 498 pages. At least two-thirds of the book is new. The contents of the book are: First Principles; General Suggestions; Weights and Measures; Prescribers and Dispensers; Special Drugs and Dispensing Conveniences; Pills and their Excipients; Ingredients of Pills and How to Mass Them; Finishing and Coating Pills; Tablets, Lozenges and Pastilles; Capsules, Powders; Suppositories, Bougies and Pessaries; Ointments; Plasters; Pastes and Jellies; Mixtures; Emulsions; Supplementary Notes on Emulsions; Applications; Incompatibles; Foreign Prescriptions; New Remedies; Homœopathic Dispensing; Illegible Prescriptions; Examination Prescriptions; Appendix of Terms to Occur in French and German Prescriptions; Abbreviations used in Prescriptions; Table of Doses and other Valuable Information.

The work is just what is needed by the practical pharmacist, and is one of the most rational books on the subject, as it treats of *why this and that is done* in compounding medicines, and brings the art nearer the science of dispensing.

MINUTES OF THE PHARMACEUTICAL MEETING.¹

The first of the series of the pharmaceutical meetings of the Philadelphia College of Pharmacy for 1900-1901 was held on Tuesday, October 16, 1900, in the Museum of the College. A number of representative pharmacists were present, and all the indications point to a successful series of meetings. Dr. Richard V. Mattison presided, and after making some brief preliminary remarks, called

¹The Pharmaceutical Meetings of the Philadelphia College of Pharmacy have been held almost continuously since January 24, 1842, on the third Tuesday of each month, from October to May, inclusive.

The object of these meetings is the presentation of original communications, the exhibition of specimens and new forms of apparatus, and the discussion of subjects of general and practical interest to pharmacists.

These meetings are open not only to the members and graduates of this College, but to all who are interested in pharmaceutical matters. Any one who can contribute to the value of them, by written communications or by the exhibition of any specimens or preparations which are likely to prove interesting, is cordially invited to participate.

Committee: Richard V. Mattison, M.D., Prof. Joseph P. Remington, Ph.M., F. W. E. Stedem, Ph.G., H. L. Stiles, Ph.G., and Prof. Henry Kraemer, Ph.D.

upon the first speaker announced on the program, Mr. Mahlon N. Kline, who then read a paper on "The Origin and History of the National Wholesale Druggists' Association." This was not only an interesting communication of itself, but is valuable as forming one of a series of papers having to do with the history and development of various pharmaceutical organizations, as well as the different departments of pharmacy. This paper appears in this number of the JOURNAL.

The second paper was entitled "Ointments, with a Formulary of the Ointments in Use at the German Hospital in Philadelphia," and was presented by Mr. M. I. Wilbert, apothecary of that institution. The paper, which appears in another part of this JOURNAL, gave rise to a most interesting discussion. Mr. Frederick T. Gordon said that, wherever a drug employed in an ointment was to be absorbed, an addition of water favored the action, and that the rapidity of absorption seemed to increase in proportion to the increase in incorporation of water. He said that cold cream was an ideal ointment in this respect.

Professor Remington stated that the subject of ointments when approached from a pharmaceutical point of view was very different from that of the dermatologist. The apothecary is apt to consider pharmaceutical advantages, as appearance, stability, etc., and that in accomplishing these he often loses sight of the object that the physician has in view. He cited an instance where a child suffering from wet eczema was treated with a glycerinated zinc ointment where the customary ointment was intended, and suffered greatly thereby. He thought that the number of official ointments might be reduced, and that the selection of base should be left to the physician. Mr. Joseph W. England thought that petrolatum was an efficient base in an ointment when its action was upon the epidermis, but that when systemic effects were to be had an addition of water to the ointment greatly facilitated its absorption and increased the action of the medicament. He referred to a series of experiments in which it was shown that salicylic acid in an ointment was much more effective when cerate or lanolin were employed as the base.

Mr. F. W. E. Stedem said that there was no trouble in securing good lard for pharmaceutical uses. He exhibited a specimen which he had been using for some years, and which he said could be

obtained of at least two manufacturing houses at very reasonable prices. He said that we should not object too seriously to the trouble connected with preparing lard if necessary for use in ointments. This he urged on the ground that the tendency on the part of clerks to avoid, as much as possible, any work connected with the making of preparations is becoming quite marked. He also remarked that Deshler's salve is a preparation which he sells in large quantities, and submitted a formula which he uses in making the preparation:

R
 Resin
 Wax āā 12 parts.
 Petrolatum 18 "
 Turpentine (oleoresin) 6 "

Fuse the resin, wax and turpentine, and when thoroughly mixed add the petrolatum and again mix; let stand a few minutes until foreign matter subsides, and then pour off carefully into the container and let cool without stirring.

Dr. C. B. Lowe said that he thought the reason why Deshler's salve was not in the recent editions of the U.S.P. was because it was in the nature of a local preparation, and was not generally used outside of Philadelphia.

Mr. George M. Beringer said that petrolatum of higher melting point was more largely used on account of the high temperatures experienced during the summer season. He remarked that in making the ointment of the yellow oxide of mercury there was a tendency on the part of clerks to mix the oxide with the whole amount of base, whereas the oxide should be rubbed with but a small part of the base at first and then the base incorporated. In referring to the question of the variation in consistency of commercial lard, he said that the quality was due to locality, and seemed to depend on the manner of feeding the hogs from which the lard was obtained; that corn-fed hogs gave a more solid lard than that obtained from those fed on swill.

A note on this subject was furnished by C. Carroll Meyer, in which he said that the last summer was particularly unfavorable to the keeping of ointments; that he had to keep most of them in the cellar, and one or two in the refrigerator. Even resin cerate "ran" this hot summer. He also said that he had a little trouble in getting a pure lard, and it seemed as if it were adulterated with a min-

eral oil (so called). He has, however, succeeded in getting a fair lard lately. The doctor of to-day, he said, generally prescribes an ointment according to his own ideas, and as a base a number write for petrolatum, while others prescribe certain proprietary ointments.

Professor Kraemer remarked that there was one feature in connection with the subject which had not been referred to, and that was the influence of temperature in making ointments; that in a series of experiments recently published by Messrs. Kahlenberg and Ruschaupt an ointment made at a higher temperature contained a greater amount of the oleate; that zinc ointment, for instance, when made at 150° C. contained a greater amount of zinc oleate. These same authors showed that lanolin was the best base in making ointments, and that lard with wax (as in ceratum) was an improvement on lard alone.

Replying to the several speakers, Mr. Wilbert said that he admitted in the paper that physiological experiments would indicate that many drugs are more readily absorbed from a base made up of animal fats, especially one containing water. On the other hand, he still held that this question is an open one from a practical standpoint. From years of experience he believes that drugs, especially those readily soluble in water, when made into a solution and incorporated into an ointment in which petrolatum is used as the base, will be quite readily absorbed. Water appears to play a very prominent part in the absorption of drugs from ointments, and he said that from 1-5 per cent. of water can be readily added to a petrolatum ointment.

In regard to petrolatum of the U.S.P., there would seem to be but little necessity of continuing this preparation under two distinct titles. The manufacturers, as a rule, furnish a petrolatum that conforms as nearly as possible to the requirements of both titles, having a melting point of about 45° C., and seldom varying more than 2° either way. This insures a solid ointment in even the warmest weather, and one that does not become hard or brittle at ordinary winter temperatures.

In referring to lard he did not mean to say that it was impossible to obtain a pure lard, but that the lard obtained by the druggist through his usual source of supply, the butcher or grocer, did not come up to the requirements of the Pharmacopœia.

In regard to making the official ointment of nitrate of mercury,

which is largely a chemical compound, it would be self-evident that an inert base could not be substituted for the lard oil.

The exhibition of specimens being next in order, Professor Moerk exhibited a specimen of carborundum as a product of the electrical furnace. He also exhibited a number of articles made from asbestos by the Keasby & Mattison Co., such as steam-pipe coverings, asbestos paper, pads, etc., and also a specimen of dolomite from which the magnesium carbonate is extracted.

In reply to a question as to the use of asbestos paper for filter paper by Professor Remington, Dr. Mattison said that its use for this purpose was prevented because of it not having sufficient tensile strength, and that in Germany an asbestos cloth is used in filtering sugar solutions.

Mr. Beringer exhibited a new water motor centrifuge which could be attached to any spigot, and with a pressure of 13 pounds a speed of 2,000 revolutions per minute might be obtained.

Mr. Gordon exhibited some plants which had been grown from seeds, and also furnished some notes on the "Culture of Drugs" (see this JOURNAL, p. 534).

On motion, the meeting adjourned.

H. K.

MINUTES OF THE SEMI-ANNUAL MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

The regular semi-annual meeting of the members of the Philadelphia College of Pharmacy was held on September 24th. In the absence of the President, Mr. Howard B. French, Mr. William J. Jenks, First Vice-President, occupied the chair.

Thirty-two members were present.

The minutes of the quarterly meeting, held June 25th, and of the adjourned meeting, held July 10th, were read and approved as read. The minutes of the Board of Trustees for the meeting held September 4th were read by the Registrar, W. Nelson Stem, and approved as read.

The report of the delegates to the Pennsylvania Pharmaceutical Association meeting, held at Ebensburg, June 26th-29th, was presented by the chairman, H. L. Siles, who stated that, as the proceedings had been largely published (see AM. JOUR. OF PHARM., August number, pages 382-388), a detailed report was not presented. Mr. McIntyre added to the report, stating that the Association had reaffirmed the position taken a few years ago that "Graduation from an accredited college of pharmacy should be required before examination by the State Pharmaceutical Examining Board," and that the National Association of Retail Druggists, at its recent meeting at Detroit, had taken the same stand.

Mr. George M. Beringer, Chairman of the Committee on Revision of By-Laws, presented the revised Code of Ethics. After discussion by several of the members, it was, on motion, ordered to lie over for action at the meeting in December next.

In this connection, it was stated that the last revision of the Code of Ethics was made about 1840.

Mr. George M. Beringer, for the Committee on Revision of By-Laws, read a proposed addition to the By-Laws, stating that some of the members believed a change from the present mode of electing officers and trustees was desirable, and that the Committee had been asked to present a plan for the consideration of the members.

The report is as follows :

Proposed new By-Law to be Article VIII, Section 19.

A Committee on Nominations shall be appointed annually at the stated meeting in June. This Committee shall consist of five members, but not more than two of these shall be members of the Board of Trustees, and no member shall serve on this Committee for more than two years consecutively.

It shall be the duty of this Committee to report to the College, at the semi-annual meetings, one or more names for each office to be filled, and for Trustees at least one name more than the number of vacancies to be filled.

The Committee shall send to the Secretary, at least two weeks prior to the date of the election, a list of the proposed nominations, and such list shall be sent to each member with the notice of the meeting.

Any three or more members may propose a candidate by submitting to the Secretary in writing such proposition at least two weeks in advance of the meeting. All names so proposed are to be included in the list of nominations sent to members, and also the names of the proposers.

The nominations may be reopened on the day of election by the vote of a majority of the members present.

In the event of the Committee failing to submit nominations for any office, the meeting shall nominate.

The report was received, and after remarks by several of the members, it was voted to have the proposed by-law published in the AMERICAN JOURNAL OF PHARMACY for the information of members, and that action thereon be deferred till the next meeting of the College.

Announcement was made of the death of our fellow-member, James G. Wells, which occurred at his summer residence, New Centreville, Chester County, on July 19th, and was buried from his city residence, 1112 Wallace Street, on July 23d. Mr. Wells became a member of the College in 1872.

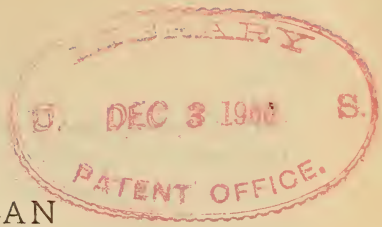
The subject of copyrighting the diploma and seal of the College was introduced, and after remarks by Professors Remington, Sadtler and Mr. Kline, the matter was referred to the President for consideration and action.

The election of three Trustees being now in order, nominations were made, and W. L. Cliffe and E. M. Boring appointed tellers, who, after a ballot, reported the re-election of Mahlon N. Kline and William E. Krewson and Henry N. Rittenhouse—newly elected—for the term of three years.

No further business, on motion, adjourned.

C. A. WEIDEMANN, M.D.,

Secretary.



THE AMERICAN
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THE GERMAN PHARMACOPŒIA.

A COMMENT ON THE NEW FOURTH EDITION.

BY MARTIN I. WILBERT.

The first of the new century pharmacopœias to make its appearance is the new fourth edition of the "Arzneibuch für das Deutsche Reich." This has recently been published and is to replace the present third edition on January 1, 1901.

The book itself is a well-printed, nicely bound volume of 538 pages. Like the preceding edition, it is printed in the German language, with the exception of the official headings or titles.

A special announcement, by the Imperial Chancellor, inserted in the front of the book, designates the date on which this book is to replace the present third edition, and in its supplement it also advertises the publisher and specifies the price at which the book is to be sold at retail. This latter is particularly reasonable. A paper bound copy is to be sold for 2 Mark 5 Pfennig; this is about equivalent to 50 cents; while a well-bound copy costs but 3 Mark 65 Pfennig, or just a fraction less than 90 cents.

Following the usual table of contents is an introduction or "Vorrede," which describes the commission that had charge of the revision; it also gives an outline history of the work, enumerates the articles that have been added to, or dropped from, the list, and gives some further general directions and explanations.

The succeeding 413 pages are taken up by an enumeration of the official substances in alphabetical order of their Latin titles. The remaining 103 pages are taken up by lists of reagents and volumetric solutions, tables of maximum single and daily doses of the more potent remedies, a list of poisonous articles that are to be

very carefully, and another list of active drugs and preparations that are to be carefully kept separate from other remedies.

Next in order we find a new addition to this Pharmacopœia, and one that will no doubt cause considerable discussion and criticism. It is a list of the atomic weights of the elements that are contained in the official chemical substances. This list is quite an innovation, as the atomic weights here presented are calculated on the basis of oxygen with the equivalence of 16. This official recognition is evidently a concession to the committee of the German Chemical Society, that was appointed to consider this subject of atomic weights, and reported on the advisability of this particular change. Whether or not it meets with general approval remains to be seen.

Following this we have a table of the variations in the specific gravities of many of the official substances at various temperatures from plus 12° to 25° C. Then, in place of an index, we have a table of synonyms and their equivalent in the official title, and in conclusion, a list of the official German titles with their corresponding Latin terms.

Having taken this rapid survey of the book, let us turn back to the main portion of the work, and incidentally compare some features of this with our own, and also with the recent edition of the British Pharmacopœia. To do this more readily we have tabulated the different points that we wish to call attention to; this will facilitate comparison, and at the same time make the argument more apparent. The first point of interest is the number of official articles; this varies from 628 in the German to 990 in our own Pharmacopœia. This is well shown in detail in the appended list:

Analysis of titles in	G.P.	B.P.	U.S.P.
Vegetable substances	177	174	255
Animal substances	15	15	18
Chemical substances	178	186	239
Galenical preparations	234	451	473
General directions	23	0	5
Cross reference	1	0	0
Total number of titles	628	826	990

It will be seen that our own Pharmacopœia leads, as far as the number of official titles is concerned, with the British Pharmacopœia second. This is no doubt largely, if not entirely, due to the fact that our own book is used over a much greater territory, and by a more composite people, and these naturally have a greater

variety of wants and opinions. One interesting item of this table is the fact that the actual number of simple animal substances is nearly the same in the three books. In explanation of the above table we would like to say that this classification is necessarily an arbitrary one, but the same principle was followed in the case of each book. Thus, for instance, all compound articles for which the Pharmacopœia gives a formula are classed as galenical preparations, while articles for which no formulas are given are classed according to their origin; for example, dilute acids are classed as galenical preparations, while wine and whiskey are classed as vegetable substances.

The following table will give the proportionate number of times that the various titles recur in each book:

Comparative frequency of various titles in	G.P.	B.P.	U.S.P.
Vegetable substances	28'2	21'1	25'7
Animal substances	2'4	1'8	1'9
Chemical substances	28'3	22'5	24'1
Galenical preparations	37'3	54'6	47'8
General directions	3'7	0'	0'5

One of the interesting features of this table is that it shows the British Pharmacopœia to have the greatest comparative number of galenical preparations. In looking through the book this seems to be explained by the entire absence of any general formulæ. These latter are most numerous in the German Pharmacopœia, and, as a practical result of this, we find that this book has the smallest number of galenical preparations. By means of these general formulæ and directions much repetition and otherwise useless material is kept out of the book, and, in addition to this, the pharmacist has an official authority for making or dispensing various preparations when no specific instructions to the contrary accompany the order or prescription. This same general plan has been introduced into our own Pharmacopœia, and, according to their instructions, the Revision Committee is allowed to still further increase the number and scope of these directions.

The next table of some of the more popular preparations will give a good illustration of their comparative frequency in the three books:

Galenical Preparations.	G.P.	B.P.	U.S.P.
Collodions	3	3	4
Decoctions	1	3	2
Extracts, fluid	4	17	88
Extracts, solid	21	22	34
Infusions	1	22	4
Liniments	3	15	9
Mixtures	2	9	4
Mucilages	2	2	4
Ointments (and cerates, U.S.P.)	22	44	29
Papers	2	1	2
Pills	4	20	15
Plasters	10	12	13
Powders	8	16	9
Soaps	4	3	2
Solutions	24	53	24
Spirits	15	16	23
Syrups	18	22	32
Tinctures	40	67	71
Vinegars	2	3	2
Waters	12	15	19
Wines	7	6	8

It will be seen that there are no less than eighty-eight formulas for fluid extracts in our Pharmacopœia, and, while no doubt all of them are in use in some portions of the country, probably not more than fourteen or fifteen are in actual demand in all parts of the United States. In this one class of preparations alone a considerable reduction could be made by decreasing the number of fluid extracts, and a further reduction in space by dispensing with many of the repeatedly given directions for making the same.

In their instructions, the Pharmacopœial Revision Committee is recommended to keep in view the desirability of a gradual approach to uniformity in the various preparations official in different pharmacopœias. The difficulty that they will encounter in this direction is well illustrated by the following table giving the strength of some of the fluid acids:

Official Acids.	G.P.	B.P.	U.S.P.
Acetic	96°	33°	36°
Acetic, dilute	30°	4°27	6°
Acetic, glacial		99°	99°-100
Hydrobromic	25°		
Hydrobromic, dilute		10°	10°
Hydrochloric	25°	31°79	31°9
Hydrochloric, dilute	12°5	10°58	10°

Official Acids.	G.P.	B.P.	U.S.P.
Nitric	25'	70'	68'
Nitric, dilute		17'44	10'
Nitric, crude	60'		
Phosphoric	25'	66'3	85'
Phosphoric, dilute		13'8	10'
Sulphuric	94'-98'	98'	92'5
Sulphuric, dilute	15'6-16'3	13'65	10'

Among other differences it will be seen that what is official in the German Pharmacopœia as acetic acid very nearly corresponds to our glacial acetic acid, and that our acetic acid is only slightly stronger than the dilute acid of the German Pharmacopœia. It is very important to keep these possible variations in the strength of the various preparations in mind, and especially in experimenting with or in making up formulæ copied from foreign journals. A still more serious variation is shown in the following table of some of the official tinctures:

Strength of Tinctures in	G.P.	B.P.	U.S.P.
Aconite	10'	5'	35'
Aloes	20'	2'5	10'
Cantharides	10'	5'	5'
Capsicum	10'	3'7	5'
Cinnamon	20'	20'	10'
Colchicum seed	10'	20'	15'
Digitalis	10'	12'5	15'
Ginger	20'	10'	20'
Iodine	10'	2'5	7'
Opium (morphine)	1'-1'2	0'75	1'3-1'5
Squill	20'	20'	15'
Strophanthus	10'	2'5	5'

It may be noted that tinctures of the German Pharmacopœia generally represent 10 or 20 per cent. of the crude drug, while those in our own Pharmacopœia vary from 5 to 35 per cent.; while in the British from 2'5 to 20 per cent. of the crude drug is contained in the finished product. This variation in the strength of these various preparations is extremely unfortunate, and particularly is this so in the case of those in the German Pharmacopœia, for not only is there a large and growing demand in this country for German medical literature both in the original German and also in translations into English, but in addition to this many graduates of American medical schools annually go to Germany for a post-graduate course, and naturally absorb German ideas and methods.

It becomes a matter of great importance, therefore, to remember that these differences do exist, and to be on the lookout for any possible misunderstanding or mistake in this particular direction.

Among the preparations or forms of dispensing for which general formulæ are given in the German Pharmacopœia, and that are somewhat foreign to us, are *Elæosacchara*, *Electuaria Granula*, *Pastilli* and *Species*. This latter would appear to us to be an antiquated method of dispensing drugs, but it seems to be still popular in Germany, especially for domestic use. This domestic or popular use of old remedies is one that should not be lost sight of. There are many drugs and preparations that are confined almost entirely to domestic practice, but the fact that they do not appear in physicians' prescriptions should not cause them to be dropped from the official lists. This fact has been recognized by the revisers of the German Pharmacopœia, and they have retained many of these popular drugs and compounds, among them no less than six formulas for species, or tea mixtures.

Some of the official titles in the German Pharmacopœia appear to us strange and antiquated. Who but a few of the American pharmacists or physicians would recognize a popular and well-known oil in "*Oleum Jecoris Aselli*."

Some of the drugs of vegetable origin are but little known in this country, but even the names of well-known drugs appear somewhat strange. This is due to the fact that the various drugs are grouped according to the portion of the plant that they are derived from; for instance, herbs, roots, fruits, seeds and leaves are grouped together with the corresponding Latin prefix, and it is this grouping that is, at first sight, bewildering or strange. The descriptions of the majority of the crude drugs are very complete, and in many cases structural details are given with great minuteness and care. This has been considered necessary owing to the fact that German pharmacists are beginning to buy many of their vegetable drugs in a cut or powdered condition. These minute histological descriptions are therefore added to facilitate the recognition of the various crude drugs, even in the comminuted state, by means of the microscope.

Assay processes have been introduced and standards established for opium, aconite, cinchona, nux vomica, belladonna, hydrastis, hyoscyamus, ipecac and pomegranate root bark. The assay pro-

cess given is a volumetric one, and while it is certainly more rapid, and in the hands of an experienced operator no doubt gives uniformly good results, still much more depends on the personal equation of the operator, and there are decidedly more possibilities of error.

It is not generally recognized that even at this late day there should be considerable doubt as to the botanical source of some of the drugs that have been in use for hundreds of years; still this is true of more than a dozen otherwise well-known vegetable substances. A few illustrations show how carefully the revisers of the German Pharmacopœia have considered the evidence in these cases, and also show the care exercised to establish standards that, while they are readily met by a good quality of the drug as found in commerce, are still high enough to prevent unscrupulous adulteration or sophistication, the appended three examples illustrating this very well.

Source of	Per Cent. Soluble in Alcohol.	Per Cent. Ash.
Asafœtida—		
G.P. Various species of <i>Ferula</i> , chiefly <i>F. asafœtida</i> and <i>F. Narthex</i>	50	10
B.P. <i>Ferula foetida</i>	65	10
U.S.P. <i>Ferula foetida</i>	60	
Myrrh—		
G.P. <i>Commiphora Abyssinica</i> , <i>Commiphora Schimperi</i>	30	6
B.P. <i>Balsamodendron myrrha</i> .		
U.S.P. <i>Commiphora myrrha</i> .		
Benzoin—		
G.P. Not determined	95	2
B.P. <i>Styrax benzoin</i>	90	
U.S.P. <i>Styrax benzoin</i> .		

Without going into an extensive discussion of the merits of the standards established here, we would like to call attention to asafœtida. It will readily be admitted that little of the gum in the American market would meet the requirements of the British Pharmacopœia, and not all of it, or perhaps not half of it, comes up to the requirements of our own standard. The addition of a maximum amount of ash would seem to be a good check on the fraudulent admixture of clay or sand.

The chemical portion of the work is, of course, of a high stand-

ard; full directions for testing and identifying the various chemicals are given, and the standards for purity, while high, do not seem to be excessively so.

The treatment given to well-known or recognized synthetic compounds can hardly be found fault with. In cases where the trade names are patented the drug is included under its scientific or synthetic name, while in others the common or trade name is Latinized and made official. The following table includes the synthetic compounds that have been admitted into the German and British Pharmacopœias, and their respective titles:

GERMAN AND BRITISH TITLES OF OFFICIAL SYNTHETICS.

	G.P.	B.P.
Antifebrine . .	Acetanilidum.	Acetanilidum.
Antipyrine . .	Pyrazolonum phenyldimethylicum.	Phenazonum.
Chloralamid . .	Chloralum fermamidatum.	
Dermatol . . .	Bismutum subgallicum.	
Diuretin . . .	Theobrominum Natrio-salicylicum.	
Phenacetine . .	Phenacetinum.	Pheuacetinum.
Saccharine.		Glusidum.
Salipyrine . .	Pyrazolonum phenyldimethylicum salicylicum.	
Salol	Phenylum salicylicum.	Salol.
Sulphonal . .	Sulfonalum.	Sulphonal.
Trional . . .	Methylsulfonalum.	

Several of these official titles are rather long and cumbrous, but even this is better than admitting a trade-marked name that is the absolute property of the manufacturer. There is one apparent duplication; in one part of the book we find a formula for making caffeine sodium salicylate, while in another portion we find a description of theobromine sodium salicylate. The tests for identification are practically the same, and it is very doubtful if there is any difference in their therapeutic value.

Among the additions to the book we find crude cresol. This is an official recognition of the rapidly extending use of this substance as an antiseptic and disinfectant; there is also a formula for a cresol soap solution that will give a product soluble in water and closely resembling lysol.

Ether for anæsthesia is one of the new additions, and with the complete and somewhat stringent tests for purity insures a satisfactory article. Among the other additions that have been or are in use in this country we find adeps lanæ. This is directed to be used in two preparations, adeps lanæ cum aqua, and in an unguen-

tum adeps lanæ. In addition to this, bismuth subgallate, bromoform, mercuric salicylate and trional have all found more or less favor with the medical practitioners of the United States.

We also find two of the more popular serums recognized and described, apparently with the object of giving the apothecary definite instructions as to their proper preservation. These instructions as to the keeping and preserving of readily decomposed articles are a distinctive and valuable feature of the German Pharmacopœia.

The book throughout shows evidence of very careful and scientific work, and a desire to maintain the highest possible standard without exceeding natural limits. Altogether it is not only a credit to the commission that had charge of the revision, but it is also a strong testimonial of the skill and scientific training of the German pharmacist whose text-book and guide it will be for the opening decade of the twentieth century.

WARBURG'S TINCTURE.

BY FERDINAND A. SIEKER.

This preparation was originally introduced as a proprietary medicine, but the formula for preparing it was later (1875) published by Dr. Maclean at Dr. Warburg's request.

The National Formulary also gives a formula for preparing this tincture. This formula is a modification of Dr. Warburg's formula, but is unsatisfactory from a pharmaceutical standpoint, to which attention will be directed below. The points of difference in the two formulæ are as follows: The original formula calls for confection of damocratis (an obsolete remedy) and for prepared chalk as constituents, both of which are omitted by the N.F. formula. The chalk is said to have been added "to correct the otherwise extremely acid taste of the preparation."¹

The original formula directs electuary of myrrh, for which myrrh is substituted (weight for weight) in the N.F. preparation. The latter preparation therefore contains about 13 times as much myrrh as the original,² but this is of little importance.

¹ See *Druggists' Circular*, 1899, p. 154.

² Electuary of myrrh consists of catechu, 4 drachms; calamus, 4 drachms; myrrh, 2 drachms; oil of cloves, 48 drops, and honey of roses, 2 ounces or sufficient.

The original formula directs proof spirit (49½ per cent. by weight of absolute alcohol), while the N.F. directs diluted alcohol (41 per cent. by weight of absolute alcohol).

According to the *Druggists' Circular*¹ the original formula called for "quinia" (presumably the sulfate was intended). The United States Dispensatory in giving the original formula directs quinine sulfate, and the National Dispensatory, quinine bisulfate. The bisulfate is certainly preferable because of its greater solubility in the menstruum employed.

The N.F. directs the anti-periodic tincture without aloes to be prepared by reducing the fibrous vegetable drugs to a No. 20 powder, adding the myrrh and camphor and digesting the whole on a water-bath during 12 hours in a suitable well-covered vessel with the proper amount of diluted alcohol, avoiding as much as possible any loss of alcohol by evaporation.

The tincture with aloes of the second edition of the N.F. is prepared by dissolving 17.5 grammes of extract of aloes, U.S.P., in 1,000 c.c. of the tincture without aloes. The first edition of the N.F. directed the use of only 28 grains in 1 pint of tincture.

It appears as if Dr. Warburg only published a formula for the regular tincture which was directed to be prepared with Socotrine aloes as a constituent.

Warburg's original formula directed the tincture to be prepared by digesting the vegetable drugs with proof spirit in a water-bath for 12 hours, expressing, adding "quinia" and replacing on a water-bath until it was all dissolved. "The liquor, when cool, was filtered."

The original formula does not direct a definite yield of finished preparation.

It does not appear whether the original preparation remained clear or became turbid. The preparation must be clear, however, in order to meet the demands of "elegant" pharmacy of to-day.

That the N.F. method does not produce a clear tincture has been repeatedly stated.

The *Druggists' Circular*,² in commenting on the N.F. tincture, states that it is an "unsatisfactory one from a pharmaceutical stand-

¹ February, 1876, and July, 1899.

²*Druggists' Circular*, 1899, pages 89, 138 and 154; 1900, page 167.

point." "We understand that it is the practice of some pharmacists to clarify the tincture," etc.

It further states that "it would seem best to follow the semi-official formula and dispense the *tincture* as a *shake mixture* until the subject receives fuller investigation."

According to the writer's experience digestion with diluted alcohol, as directed by the N.F., gives a preparation that will not remain clear after filtering. Digestion with proof spirit is also unsatisfactory. Maceration followed by percolation with the diluted alcohol, or with 6 volumes of alcohol and 4 volumes of water, gives somewhat better results, but such a tincture will not remain clear.

Maceration (not percolation) with 6 volumes of alcohol and 4 volumes of water at a temperature not exceeding 15° to 20° C. gives excellent results. A tincture thus prepared remains bright and clear, excepting for a slight amount of precipitate which settles to the bottom.

The turbidity of the tincture prepared by digestion on a water-bath appears to be at least partly due to the solution of oily and resinous matter at the elevated temperature, which is imperfectly thrown out of solution on cooling.

Warburg's tincture is not a concentrated preparation (containing only about 3 per cent. of extractive matter, not including the quinine sulfate) and for this reason it can be prepared of proper strength by maceration. A tincture prepared by this method at a comparatively low temperature is less contaminated with fatty matter, etc.

The following working formula has been used for several years with results that were entirely satisfactory :

	Grammes.
Socotrine aloes	263
Angelica seed (freshly ground or crushed)	85
Rhubarb (ground)	85
Elecampane (ground)	42'5
Crocus (entire)	42'5
Fennel (freshly ground or crushed)	42'5
Prepared chalk	
Gentian (ground)	
Zedoary (ground)	
Cubebs (freshly ground or crushed)	
Myrrh (entire freshly crushed)	
Camphor	
Agaric (powdered), of each	21'25

Macerate all of the above ingredients for from one to two weeks or longer in a cool place (15° to 20° C.), with occasional agitation, with 9,000 c.c. of a mixture consisting of:

Alcohol	6,000 c.c.
Water	4,000 c.c.

Then decant the clear liquid and forcibly press out the residue. Thoroughly break up the residue and wash it with the remainder (about 1,000 c.c.) of the menstruum and again press it forcibly. Filter any part of the liquid that is not clear, then mix the clear liquids and measure.

Then add:

Quinine sulfate	200 grammes.
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Determine how much water (four volumes) and alcohol (six volumes) will be necessary to make 10,000 c.c. of tincture. Mix the quantity of water necessary with

Sulfuric acid (conc. U.S.P.)	22 grammes.
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and add this to the tincture. Finally, add the quantity of alcohol necessary to make 10,000 c.c. of tincture and mix. Filtering is unnecessary.

The tincture should be prepared during the cold season of the year, if convenient.

It has been stated (see above) that the chalk is used "to correct the otherwise extremely acid taste of the tincture." If it actually changes the taste has not been determined by the writer. It was observed, however, that the tincture, before adding the quinine sulfate and sulfuric acid (or quinine bisulfate), has a distinct acid reaction toward not very sensitive blue litmus paper, and that the marc effervesced strongly on the addition of hydrochloric acid, showing that at least considerable of the calcium carbonate remained unchanged. It has not been considered of sufficient importance to determine if the calcium carbonate neutralized any part of the acids or acid resin that are present in the drugs employed.

A tincture prepared according to the above formula possesses a reddish-brown color (which is somewhat darker before the quinine bisulfate is added). It is perfectly clear and possesses a bitter taste, an aromatic flavor and an acid reaction. 29.57 c.c. (1 fluid ounce) of tincture represents 0.81 gramme (12.5 grains) of quinine

bisulfate, which is equivalent to 0.648 gramme (10 grains) of quinine sulfate.

A sample prepared about one year ago was recently examined. It was perfectly clear but for a slight amount of sediment. The specific gravity was 0.943 at 15° C., at which temperature it remained clear. Ten cubic centimetres on evaporation and drying left 0.49 gramme of a brittle extract.

A commercial sample examined some time ago was a perfectly clear reddish-brown preparation with but little sediment. It contained 56 per cent. by volume or 48½ per cent. by weight of absolute alcohol. Ten cubic centimetres yielded 0.4205 gramme of dry extract. It was not further examined.

Warburg's Tincture without Aloes.—A satisfactory preparation will result by following the above formula with the omission of the aloes. Or, if it is desired to prepare the regular tincture from this preparation as the N.F. directs, Socotrine aloes should be employed in preference to the powdered extract of aloes.

Warburg's Tincture Modified.—This preparation is also known as "special" or "altered" Warburg's Tincture. There continues to be some demand for this preparation.

It can be prepared by following the above formula for the *regular* tincture, but substituting for the quinine sulfate and sulfuric acid, 66.66 grammes of each, cinchonine sulfate, cinchonidine sulfate and chinidine, pure. The sulfuric acid is not necessary.

This tincture is somewhat darker in color than the regular tincture, and possesses a feeble alkaline reaction, which is due to the chinidine that it contains.

There is also some demand for the modified tincture without aloes.

According to the statement of one manufacturing firm, their modified Warburg's Tincture differs from the original in that many of the supposed useless ingredients have been eliminated. This tincture contains quinine and not the cheaper alkaloids.

In conclusion, the writer wishes to state that this paper is not intended to present an argument in favor of preparing all tinctures by maceration, but, in his experience, a few other tinctures can be prepared of proper strength and of more satisfactory appearance by maceration than by percolation.

AN IMPROVED PROCESS FOR THE PREPARATION OF
TINCTURA OPII DEODORATI.

BY FREDERICK T. GORDON.

Although furnishing a most satisfactory product, provided that there has been skill and care in manipulation, the present U.S.P. process for the preparation of Tinct. Opii Deodorati is far from being satisfactory itself to the working pharmacist. The U.S.P. process is long and tedious, involves the use of an expensive and highly inflammable solvent and calls for a high degree of skill and care to turn out a really creditable product. Any one who has ever tried the difficult task of pouring off the ethereal layer from the aqueous one and separating all the ether from the finished tincture will appreciate the allusion to care and skill. Then there is the ever-present danger of fire from the inflammability of the ether, a danger not imaginary, as frequent accounts of drug-store fires and explosions from this cause will show, and the item of the cost of the ether, even if much of it is saved and worked up into liniments as is done in many cases. For these reasons and others with which I will not weary you, there has long been a desire on the part of pharmacists for a practical process for making the deodorized tincture of opium that will stand the test of laboratory manipulation.

Various processes for the tincture and substitutes for ether have been suggested; of these, probably the most practical is the employment of a "denarcotized" opium from which the undesirable principles have been removed before its use in making the tincture. However, the effective and economically practical denarcotization of opium is rather beyond the resources of the working pharmacist on a small scale, and besides there is good ground for dissatisfaction with the product made from this article. What the worker wants is a process cheap and effective and one that will put him on an equality with the large manufacturer, that is, unless the making of galenical preparations is to become a lost art in pharmacy.

Probably because of the unsatisfactory processes for its manufacture and its greater cost, the deodorized tincture of opium, although an ideal preparation of the drug from a therapeutic standpoint, has never gained the general use that its merits would deserve. Laudanum, a cheaper and easier made preparation, still holds full sway, and is used in pints where the other is used in drachms! We

thus have the strange spectacle of two preparations of the same drug having identical strength of active principle, of which the least desirable is the most prescribed! Then, too, this is an unnecessary multiplication of representatives of the drug, which is entirely foreign to the tendency of the age, which demands a simplicity of standards. I venture to hold the hope that by suggesting a method cheap and easy of application for the making of the better preparation, this may to a greater extent supplant the inferior, and I would earnestly ask my hearers to give this point of the subject their thoughtful consideration, that some good may come from the thought.

Lest I be accused of plagiarism, I wish to state that I do not claim entire originality for the process I am about to suggest; as I understand it, the employment of paraffin for the deodorizing of opium was suggested many years ago, but the idea was never taken up, as far as I can learn, and was forgotten. A month or so ago, the idea was mentioned in conversation by Mr. J. R. Elfreth, of this city, as being possibly of value and practical; its advantages seemed so great at once to both of us that we determined to work it out practically. To him belongs the credit of reviving an old and forgotten idea; my share was in the testing and elaborating of a practical working process. I may state that the assays, etc., were also a part of my work.

The process I have the honor to suggest as a substitute for the present U.S.P. method is as follows, the formula being for 1,000 c.c. of finished product:

“Take of granulated opium, of U.S.P. standard, 100 grammes; put this in a suitable bottle and add 300 c.c. of boiling water. Macerate for from 24 to 48 hours, according to the fineness of the opium, with frequent agitation; then transfer the drug and menstruum to a percolator, and percolate in the usual manner with tepid water until the drug is thoroughly exhausted (*i. e.*, until a drop of the percolate is entirely free from taste and gives only a slight cloudiness with Mayer’s reagent), reserving the first 300 c.c. of percolate and collecting the dilute percolate separately. Evaporate at a gentle heat the dilute percolate to 200 c.c., mix this with the concentrated portion and bring both to a temperature of about 180° F. in a suitable evaporating dish. Now add 150 grammes of paraffin, U.S.P., having a melting point of 120° approximately, in

small pieces, and when this has melted and become fluid, agitate the two liquids together thoroughly for five or ten minutes, until the paraffin no longer seems to darken in color. Set the dish aside until the paraffin has cooled and hardened, break the crust and pour off the deodorized aqueous solution of opium from it, washing out the dish and the under side of the paraffin crust with a small quantity of water to remove adhering tincture. Filter the solution of opium through a good filter, make up to 800 c.c. with cold water added through the filter, add 200 c.c. of alcohol, and make up to 1,000 c.c. with sufficient water to balance the loss from shrinkage of the mixture of alcohol and water."

The resulting product is a clear, deep red-brown tincture, bright and transparent, entirely free from odor of opium and possessing a clean, bitter taste slightly suggestive of that drug. This tincture is permanent, does not precipitate on standing and fully represents the desirable qualities of opium. The advantage of the process just stated as a practical working one will be apparent at once to the pharmacist; instead of having to deal with a highly volatile and inflammable solvent that must be separated from the aqueous layer by troublesome decantation, he simply has to pour off the deodorized percolate from a solid body; indeed, the veriest tyro cannot fail of success along these lines.

One or two questions must be answered before this method can be granted recognition. The first of these, "does the paraffin thoroughly remove the narcotic and odorous principles from the opium percolate?" is answered by the appearance, odor and taste of the finished product decidedly in the affirmative. To test this further, some of the paraffin used in making the tincture was melted and shaken up with warm N/10 sulphuric acid; this took on a dark color, had the nauseous taste and smell of crude opium, and on evaporation gave a residue that answered to the tests mentioned for narcotine. The second question, "does the paraffin dissolve and remove any of the morphine from the percolate?" is very important; this can be answered positively in the negative. First, some of the paraffin was carefully washed to remove possibly adherent traces of drug, melted and shaken up with N/10 sulphuric acid, and this was tested for morphine.

To these tests there was shown not the slightest trace of morphine, even when the residue was treated so as to obtain any pos-

sible alkaloid free from foreign matters. Pure meconate of morphine was then warmed in a test-tube with fresh paraffin for an hour or more, the paraffin tested to see if any had dissolved and the meconate washed free from paraffin and weighed again. To this test not the slightest indication of solubility was afforded, the meconate of morphine having been chosen as being very nearly the same salt of morphine as is probably present in opium.

To reach conclusive results, assays of various samples of opium and the tinctures made from them were carried out. From a granulated opium bought from a jobbing house, with a guaranteed assay of 15.20 per cent. morphine, a tincture was made that assayed 15 per cent. morphine. In my hands this opium assayed 15.10 per cent., $\frac{1}{10}$ per cent. less than given. A gum opium (dried) was next used, assaying 13.45 per cent. morphine; this gave a tincture perfect in all respects, yielding 13.30 per cent. morphine. Several other samples of the drug were used with like results, the assay in all cases agreeing in showing the finished tincture to have lost about $\frac{1}{5}$ of 1 per cent. morphine in the process of manufacture. This may be, and is, likely due to difficulties in the complete exhaustion of the opium, as it was conclusively shown that none of the morphine was lost in the paraffin. It seems to me that a process that will give these results leaves little to be desired. I might state that these assays were in every case made in duplicate and by different methods, they agreeing to all practical intent. The morphine yielded in the assay of the tincture was remarkably light in color even before washing, and seemed very free from contaminations.

The relative cost of the two methods, based on the price of materials lately quoted, is \$1.40 per 1,000 c.c. for the U.S.P. tincture to \$1.05 for the "paraffin tincture," a saving of 35 cents, due chiefly to the saving of the cost of the ether. This, with the decided advantage of easy working, should certainly suggest the adoption of the "paraffin method" as the official U.S.P. process in the 1900 Pharmacopœia, if the same results as I obtained should be reached in the hands of the working pharmacist, and of this I have not the least doubt. Furthermore, with an easy and cheap mode of manufacture, we can also consider the question of adopting this preparation as the sole liquid representative of opium, relegating laudanum to the limbo of confections, boluses and such ancient products of pharmaceutical skill. If it should be found necessary to its

preservation, the percentage of alcohol could be slightly increased in the new *Tinctura Opii Deodorati*. If I may be permitted, I would respectfully suggest this proposition to pharmacists for general consideration.

A little point arising from working details may be of value to pharmacists. Granulated opium is far superior to powdered opium for making any of its preparations by percolation, its use doing away with many of the troubles of percolating a powdered drug that will gum in spite of the addition of sand, calcium phosphate, etc. Opium in this form can be purchased in the open market, but the pharmacist can easily prepare it for himself by cutting the crude drug into thin slices, drying these thoroughly and grating the crisp slices through a very coarse wire sieve. This, I believe, is the basis of the method of the manufacturers. Of course, an assay must be made of the granulated opium, as the drug will lose much moisture and weight in drying and increase in strength thereby.

LITHIUM BICARBONATE.

BY LYMAN F. KEBLER.

For some time past repeated inquiries have come for lithium bicarbonate, and certain manufacturers are supplying an article which they call by this name. Theoretically it is possible for this chemical to exist, but thus far, so far as the writer knows, it has never been prepared, except in solution. Being anxious to know whether some one had really succeeded in preparing lithium bicarbonate, the writer secured a sample and made a careful analysis. It consisted of white crystalline crusts. One part of the finely powdered chemical required 75 parts of distilled water, at 15° C., for solution. The solution is alkaline to litmus. On heating a given weight to 200° C. for some time, there was a loss of 0.29 per cent.; farther heating to fusion increased the loss only slightly. On intimately mixing one part of the finely powdered article with twice its weight of pure powdered ammonium sulphate and igniting there will be left lithium sulphate. By this process the article contained 98.39 per cent. of lithium carbonate. This method includes as lithium the inorganic incidental impurities of which traces are present.

By the acidimetric method the sample contains 97.97 per cent. of

lithium carbonate. By estimating the lithium as lithium phosphate, the result shows that the article contains 18.42 per cent. of lithium, which corresponds to 97.39 per cent. of lithium carbonate.

Lithium carbonate contains 18.918 per cent. of lithium.

Lithium bicarbonate " 10.294 " " " "

Lithium carbonate requires about 75 parts of water at 15° C. for solution, but when it is suspended in water and a current of carbon dioxide introduced until saturation results 20 parts of such water will dissolve one part of the chemical. It is generally believed that the increased solubility is due to the formation of lithium bicarbonate. On allowing such a solution to evaporate spontaneously or even with the application of a small amount of heat, there will be formed prismatic crystals or crystalline crusts, but these crystals have never yet proved, on analysis, to be lithium bicarbonate, but always the normal salt. In fact, this same procedure is usually employed for the purpose of preparing pure lithium carbonate.

From the above results and our general knowledge there is only one deduction, viz., that the article supplied in this case for lithium bicarbonate is nothing but crystallized lithium carbonate, and in all probability this is the only chemical that has ever been supplied for lithium bicarbonate.

SUBSTITUTE INFANT-FEEDING.¹

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The question of the home preparation of an infant's food is one that occasions more or less difficulty to the average practitioner. Very little disturbance of digestion is caused by average breast milk, but when it comes to bottle-feeding, trouble often appears, and here the physician has abundant opportunity to show his knowledge of dietetics. There is no end to the number of the so-called "perfect substitute for mother's milk" that are widely advertised, but the mainstay of successful bottle-feeding is good cow's milk. Anything else must be only a temporary substitute. The infants who cannot

¹*Jour. Amer. Med. Assoc.*, 1900 (xxxv), p. 71.

take properly prepared cow's milk are very rare. The trouble often comes from the inability of the physician to properly modify the milk so as to make it suitable for the case in hand. It is impossible to lay down fixed rules for infant-feeding, as each case must be treated by itself, but there are certain underlying principles involved which, if understood, will greatly simplify the problem.

The important things to know are, first, how to secure good cow's milk, and, second, how to change or modify it so that it shall be as near as possible an approach to mother's milk in composition and digestibility. The first problem before the physician is to secure a supply of good fresh milk. This can be had anywhere, by the exercise of a little care. Let the cows be cleaned as thoroughly as horses, and the udders and sides wiped off with a damp cloth just before milking. Let the milking be done with clean, dry hands, into a clean pail held close to the udder. The first stream or two from each teat should be thrown away, and not allowed to get into the pail, for during intervals between milking bacteria from the air get into the cow's teats, and grow with wonderful rapidity. By throwing away the first few streams, at the beginning of the milking, these are disposed of. If the sides of the cow are plastered with dirt and manure, as is often the case, a certain amount is sure to fall into the pail of milk. This is where the trouble really begins, for this dirt and manure abounds in bacteria. Over two hundred species of bacteria have been found in milk, about twenty of which produce lactic acid. Other species produce ropy, slimy, blue and red milk, also alkaline products. These bacteria themselves are practically harmless, but the products of their growth may seriously affect the healthfulness of milk. Pathogenic bacteria are occasionally found in milk, but they get there almost invariably through the water used in washing the milk cans or bottles, or from the skin of some infected attendant. Tubercle bacilli are found in milk from cows with tuberculous udders, but the danger of infecting human beings is thought to be greatly overrated. Tubercle bacilli do not grow in milk.

As soon as each cow is milked, the milk should be run through an aerator and cooler, in a room free from bad odor or tobacco smoke, and then kept as cool as possible until used. It is obvious that cows should be stabled in clean, well-ventilated barns. These conditions should be possible everywhere, and if the physician will

insist upon their observance on the part of dairymen, the problem of a proper milk-supply will be largely solved.

The prompt and rapid aeration and the cooling of milk are matters of importance. The temperatures at which bacteria in milk grow most rapidly are those near body heat. There is practically no growth when the temperature is below 50° F. It has been proved that bacteria which increased two hundred fold in four hours, at 93° F., increased only eight fold at 55° F.; so the necessity of cooling the milk immediately after milking will be apparent.

Combined aerators, strainers and coolers, suitable for use with well-water or ice-water, can be had at any dairy-supply house, at a small cost. By using one of these, the cow odor, the animal heat, and most of the dirt can be removed from milk in a few minutes. The milk of a herd of cows can then be mixed and bottled, or canned and packed in ice, or, as is often done, lowered into a well or set in a cool spring. Such milk will keep well, while milk "warm from the cow" soon spoils.

Sometimes dairymen add preservatives to their milk, to keep it sweet. The articles most commonly used are boric acid, borax and formaldehyde. Formaldehyde is particularly objectionable, as it renders the curds exceedingly tough. It can be detected by adding to a small quantity of slightly diluted milk an equal quantity of commercial sulphuric acid. Pour the milk into a test-tube or flask, and then allow the acid to run in, so as not to mix with the milk. A violet color will appear at the junction of the two liquids if formaldehyde is present, and the curd of the milk will dissolve slowly when the tube is shaken.

In selecting cow's milk for infant-feeding, that which is clean, aerated, cooled and bottled immediately after milking, and kept below 60° F., until delivered, is the article to be chosen by the physician. The richness of milk and cream depends upon the breed of cattle supplying the milk. In most of the States that have dairy laws the minimum amount of butter fat allowed in the milk is 3 per cent. In actual practice milk varying between 3 and 5 per cent. butter fat will be met.

In reference to the production of butter fat, cows may be roughly divided into three classes: (1) Fancy, full-blooded Guernseys and Jerseys, giving milk containing 5 per cent. and over; (2) ordinary Jerseys and Guernseys, known as "butter cows," giving milk contain-

ing 4 per cent. and over; (3) Ayrshires, Holsteins and common stock, known as "milk cows," giving milk containing 3 per cent. and a little over.

A physician in a given neighborhood should find out what breeds of cattle supply the milk to the vicinity, in order to know about the proportion of butter fat contained in the milk. The milk of one dairyman will run quite uniform from day to day, as the variations in the milk of individual cows will compensate each other.

In mother's milk the fat is usually between 3 and 5 per cent., or nearly three times the proteids, which vary from 1 to 2 per cent.; while the sugar is between 6 and 7 per cent. As noted above, cows' milk will contain from 3 to 5 per cent. butter fat, while the proteids about average 4 per cent., and the sugar from 4 to 5 per cent. It is pretty well settled that in mixed cows' milk the proteids about equal the fat when the fat does not exceed 4.5 per cent. When the fat in the whole milk is above 4.5 per cent., the proteids are a little less than the fat.

While in most cases a medium grade of milk will be supplied, especially in towns and cities, still, we must be prepared to properly modify either very rich or poor milk. An easy way of calculating percentages is to take advantage of the process known in the dairy industry as the "deep setting process of creaming." This consists in putting milk into tall, narrow vessels and cooling to about 40° F. After twelve to twenty-four hours practically all the fat of the milk will be found in the creamy layer, the remaining milk often containing no more than .2 to .5 per cent. Milk that has been bottled and kept cool for twelve to twenty-four hours is subjected to the conditions necessary for successful "deep setting" creaming, and usually contains a layer of cream in the neck of a quart bottle, between three and four inches deep, measuring from the top, or about six fluidounces. The line separating the cream from the remaining milk is distinct. Unless the creamy layer is distinct when the milk is delivered, it is probable that bottling has not been done at the dairy, but in the town or place of delivery. Not only is the proper creaming thus interfered with, but the chances of contamination are increased.

By taking all of the cream and part of the remaining milk from the quart bottle of milk and mixing in certain proportions, top milks, rich or poor in fat, can be had that may be utilized in feeding

the infant. Top milks can be prepared in which the fat is one and one-half to five times the proteids.

In the home modification of milk, by means of this bottled milk, the cream is readily and accurately separated from the remaining milk by means of a dipper measuring exactly one fluidounce. The first dipperful, or ounce, is taken off with a teaspoon, otherwise the milk would spill over when the dipper is let down. The successive ounces of cream are then easily removed, by even an unskilful hand, without jarring, siphoning or other manipulation.

The following assays, made by the Babcock method, show the percentages of fat in different top milks, taken from quart milk bottles, and represent low, medium and high-grade milk, which was bottled in the country:

Fat in whole milk		3'1	4'3	5
Fat in Top	9 ounces	9'2	12'4	14'6
Fat in Top	10 ounces	8'37	11'2	13'2
Fat in Top	11 ounces	7'7	10'4	12'1
Fat in Top	12 ounces	7'0	9'6	11'1
Fat in Top	13 ounces	6'6	9'0	10'4
Fat in Top	14 ounces	6'2	8'4	9'7
Fat in Top	15 ounces	5'8	7'9	9'0
Fat in Top	16 ounces	5'5	7'5	8'6

Proteids and sugar are assumed to be 4 per cent. each.

It will be noticed that the first nine ounces or dipperfuls contain about three times as much fat as the whole milk in all three grades. This rule held good in thirty quarts of bottled milk on which the cream had risen, obtained of different dealers.

For matter of easy calculation, it is assumed that the proteids and sugar are 4 per cent. each. In practice, all that is necessary is to dip off top milk of any desired richness, and dilute it, two, three, four, five, six or eight times. If about 3 per cent. of fat and 1 per cent. of proteids is desired, nine ounces will be dipped out of the bottle of milk on which the cream has risen. If it is poor, bluish-colored milk, it will be diluted three times, that is, one-third of the desired mixture will be top milk. If the milk is of a fair degree of richness, it will be diluted four times—one-quarter of the desired mixture will be top milk. If the milk is very rich, it will be diluted five times—one-fifth of the desired mixture will be top milk. By dividing the figures in the table by the dilution, average percentages will be obtained. This is as near to accuracy as percentage feeding

can be brought at home, and is sufficient for the vast majority of cases. The proper percentages for each child are obtained by increasing or decreasing the richness and the dilution of the top milk. What is needed in a given case is a dilution of cow's milk that will agree with the baby we are trying to feed, rather than the procuring of figured percentages. By this method every physician can vary the strength of the milk in a sliding scale by directing the number of ounces to be dipped out of the bottle of milk, and thus tentatively reach the strength that is suitable for the infant's digestion.

For every twenty or twenty-five ounces of food, add one ounce of sugar, in order to bring this element up to the proper proportion. One part of sugar to 20 parts of food yields 5 per cent.; to 25 parts, 4; to 33 parts, 3; to 50 parts, 2 per cent. An even tablespoonful of granulated sugar equals half an ounce approximately, and one scant teaspoonful equals a drachm. Half again as much milk sugar equals the same weights.

The next important step is to get the cow's milk as nearly as possible in the same physical condition as mother's milk. The diluent I prefer to use is a wheat, barley or oatmeal gruel, the starch of which has been digested or dextrinized by the action of diastase. A heaping tablespoonful of flour, made from a cereal, is boiled with about a pint and a half of water for fifteen minutes. It is then removed from the stove and set in cold water for about three minutes to cool it. When it is sufficiently cool to taste, a teaspoonful of a preparation of diastase is added, which renders the gruel thin and watery. This makes about a pint of gruel, containing the starches in soluble form, while the cellulose or skeleton of the cereal acts as a most effective attenuant of the curd. These digested gruels render the milk curds porous, and also provoke the secretion of the digestive juices. As diluents they are a great improvement on water. Most of the thick malt extracts are sufficiently active in diastase to produce the desired effect. The writer, however, prefers the employment of diastase itself, without any of the other malt ingredients, as being both speedy and efficient. It can either be produced cheaply at home or purchased at the nearest drug store. A simple decoction of diastase may be made as follows: A tablespoonful of malted barley grains is put in a cup, and enough cold water added to cover it, usually two tablespoonfuls, as the malt quickly absorbs some o

the water. This is prepared in the evening and placed in the refrigerator over night. In the morning the water, looking like thin tea, is removed by a spoon or strained off, and is ready for use. About a tablespoonful of this solution can be thus secured, and is very active in diastase. It is sufficient to dextrinize a pint of gruel in ten to fifteen minutes. Preparations of diastase are made by a number of chemists—Forbes, Parke, Davis & Co., Horlick and others. There is now obtainable an active glycerite of diastase known as Cereo, which is specially made for the purpose of dextrinizing gruels.

Now the question of pasteurization—heating to 167° F.—or sterilization—heating to 212° F.—arises. It should be remembered that the object of pasteurizing and sterilizing milk is to kill the bacteria, and in that way make the milk suitable for infant-feeding. If the milk was originally clean, cooled immediately after being drawn, and kept cool, there would be no need of heating the milk to kill bacteria. In the summer time, where it is impossible to keep the milk below 60° F., it is best to have it pasteurized as soon as it is received.

It is often recommended that lime-water or bicarbonate of soda be added to milk when it is slightly acid. The acidity of milk is caused by bacteria that produce lactic acid. If the acid is neutralized, the bacteria will produce more acid, unless the milk is either kept cool or heated to destroy the bacteria.

There are cases constantly arising where milk must be withheld for a time, or given only in small quantities. Here is where the judgment of the physician may be put to a severe test. The symptoms that call for a modification or a change of diet are vomiting, colic and unnatural stools. A brief glance at these conditions may be helpful to some in applying dietetic remedies.

Vomiting.—When vomiting occurs immediately after feeding, it is probably caused by a simple distension of the stomach, and less bulk of food is accordingly indicated. The vomiting that occurs some time after feeding is apt to be caused by undigested food; the rejections are frequently highly acid, and there may be curds and mucus present. Projectile vomiting, where food is rejected with force, is an indication of brain irritation.

Colic.—Colic may be caused by cold, but is more frequently induced by the fermentation of indigestible food.

Condition of the Stools.—Much may be learned by a careful inspection of the stools, with reference to increasing or diminishing the various kinds of food. The normal infant stool is smooth, yellow, homogeneous, and about the consistency of thin mush. The following may be considered abnormal types :

(1) Green Stools.—Stools can only be considered green when that condition is evident immediately upon their passage. They are due to a fermentation which is doubtless the result of bacterial action. All stools become green a certain time after passage, caused by oxidation of the air.

(2) Curdy Stools.—Curdy lumps may be produced by undigested casein or fat. The former are hard and yellowish, while the latter are soft and smooth, like butter.

(3) Slimy Stools.—These are the result of catarrhal inflammation. When the mucus is mixed with the fecal matter, the irritation is high up in the bowel, but when flakes or masses of mucus are passed, the trouble is near the outlet.

(4) Yellow, Watery Stools.—These are seen in depressed nervous conditions, especially in the hot days of summer, when the bowel is relaxed, and the inhibitory fibres of the splanchnic nerve do not act to advantage.

(5) Very Foul Stools.—These are caused by decomposition of the albuminoid principles of the food.

(6) Profuse, colorless, watery stools, with little fecal matter, are doubtless caused by an infective germ, akin to that of Asiatic cholera. This is known as *cholera infantum*.

It is rare to see one of these types by itself. With the exception of the last, they may be seen in all combinations.

In slight forms of unnatural stools, increase the dilution of the top milk, and reduce the quantity of sugar slightly. If large lumps of fat are in the stools, use milk containing less fat for diluting; this can be obtained by taking more top milk out of the quart bottle. Where lumps of casein are apparent, the diluent must be increased. If increasing the dilution and reducing the fat and sugar does not overcome the trouble, stop the milk and feed dextrinized gruel for a day, gradually adding a little milk, which is increased in amount as fast as the infant can digest it.

There are times when infants can not digest milk in any form, no matter how much it may be diluted, nor what diluent is employed.

They may then be given mutton broth, from which the fat has been removed, extracted beef-blood and water, dextrinized wheat or barley gruel, or dextrinized gruel, to which either the white or yolk of an egg has been added.

The following will show the food principles obtained by such egg mixtures:

Dextrinized gruel and white of egg.—Dextrinized wheat-flour gruel, 8 fluidounces, white of one egg—581 grains (large egg).

About 2 per cent. proteids (egg, 1.25; gruel, .75), 4 per cent. soluble carbohydrates.

Putting two even spoonfuls of granulated sugar into this mixture, 3 per cent. of sugar is added, which, with the 4 per cent. of digested starch, makes 7 per cent. total soluble carbohydrates.

White of egg contains 85 to 88 per cent. water; .07 per cent. salts; 10 to 13 per cent. proteid bodies, made up of albumen, globulin and mucoid substance and traces of fats, lecithin and cholesterin.

Dextrinized gruel and yolk of egg.—Dextrinized wheat-flour gruel, 8 fluidounces, yolk of one egg—288 grains (large egg).

About fat, 1.7; proteids, 1.7 (egg, 1; gruel, .70), and 4 per cent. soluble carbohydrates.

By putting two even spoonfuls of granulated sugar into this mixture, 3 per cent. of sugar is added, which, with the 4 per cent. of digested starch, makes 7 per cent. total soluble carbohydrates.

Yolk of egg contains about 47.19 per cent. water and 52.81 per cent. solids, made up of 15.63 per cent. proteids, .96 per cent. salts, 22.84 per cent. fat, 10.7 per cent. lecithin and 1.75 per cent. cholesterin. Proteids of yolk contain phosphorus and iron, which is of great importance in the formation of blood, and a pseudonuclein which is also found in casein of milk. These are not present in the proteids of the white of egg. Lecithin, which also contains phosphorus, is undoubtedly "a very important material for building up of the complicated phosphorized nuclein substance of the cell and cell nucleins." Lecithin is also found in milk, especially woman's milk.

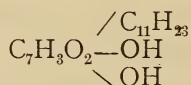
THE FRUIT OF RHAMNUS CATHARTICA contains, according to Tschirch and Polacco, emodin, three yellow pigments, a violet pigment, rhamnochrysin and bitter substances.

RECENT LITERATURE RELATING TO PHARMACY.

EMBELIC ACID.

Ribes embelia yields 2.5 per cent. of this substance, by percolation with ether and successive crystallization from hot alcohol benzol and cold alcohol. It melts at 142° C., and is insoluble in water, but soluble in dilute acid and dilute alkali. Excess of alkali precipitates the embelate formed, while excess of acid throws the embelic acid out of solution. The substance has acid reaction, precipitates with ferric chloride and lead acetate, but does not reduce Fehling's solution. Analysis of the acid, its silver salt and its amine derivatives shows its formula to be $C_{18}H_{23}O_4$.

It forms a di-benzoyl compound (hence has two hydroxyl groups); under influence of nascent hydrogen yields a hydro-embelic acid, $C_{18}H_{30}O_4$; and oxidizes with potassium permanganate to lauric acid; data pointing to the graphic formula



and the group $C_7H_3O_2$ appears to be a methyl quinone.—(Heffter and Feuerstein, *Arch. Ph.*, 1900, 15.)

H. V. ARNY.

TELFAIRIA OIL

The seed of *Telfairia pedata*, a climbing plant of East Africa, yields 43 per cent. of an oil of specific gravity, 0.918; acid number, 0.34; saponification number, 174.8; ester number, 174.46; and iodine absorption number, 86.2. Fractional precipitation of its lead soap gave an ether-insoluble part consisting of stearic and palmitic acids, and a thick liquid soluble in ether, from which was fractionated a peculiar unsaturated acid, solidifying at $+6^{\circ}$ C., boiling at 220° to 225° C., at 13 millimetres pressure, analyzing to $C_{18}H_{32}O_2$, and yielding a crystalline tetrabrom compound. This acid is called telfairia acid. It is oxidized in dilute alkaline solution by potassium permanganate to sativic acid, $C_{18}H_{33}O_2(OH)_4$, and in concentrated alkaline solution to azeleic acid, just as is linoleic acid. The ether-soluble portion also contains an unsaturated oxy-acid, all these acids being present in the oil as glycerides.—(H. Thoms, *Arch. Ph.*, 1900, 48.)

H. V. A.

IDENTIFICATION OF TYPHOID BACILLI.

Use as culture medium; normal urine (made feebly alkaline by standing a day or so), 100; pepton, 0.5; gelatin, 3.3; heat on water-bath three-quarters of an hour, filter into test-tubes, which are to be closed with cotton. Sterilize with steam fifteen minutes one day and 100 minutes the next day. Culture temperature must be exactly 21.5° to 22° , hence a thermostat is essential. In this medium the typhoid germs (from fæces, etc.) grow in small oblong and clear colonies, with characteristic flagella, easily distinguishable from colonies of *Bacterium coli communis*, which form round and granulated groups.—(M. Piorkowski, *Ber. Dtsch. Ph. Ges.*, 1900, 6.)

H. V. A.

BLAUD'S PILLS.

An interesting example of the influence of business enterprise on professional thought is shown in the recommendation of the German Pharmacopœial commission, that the pills of ferrous carbonate be made by Blaud's formula rather than from the now official Vallet's mass.

The German press, commenting thereon, attribute the change to the extensive use of the Burroughs-Wellcome Blaud's Tabloids, which have practically driven the official pill from the market.

Dr. E. Hansen (*Ap. Zt.*, 1899, 711) criticises the formula suggested by the commission, because it calls for magnesia as a constituent. He shows that this hinders solution, and does little to prevent premature reaction between the ferrous sulphate and the potassium carbonate. He recommends a recipe containing the two substances althæa and honey, laying stress on the fact that honey is a better preservative in this case than glycerin and sugar.

H. V. A.

SALICIN AND ITS PRODUCTS.

Despite the Pharmacopœial definition of salicin, "a neutral principle," etc., all late literature on the subject points to its glucosidal character. A. Voswinkel (*Ber. Dtsch. Ph. Ges.*, 1900, 31) confirms the fact that salicin breaks into saligenin and glucose. He further finds that Piria's saliretin is a second combination of saligenin and glucose—exactly how, he cannot decide. However, he shows that this substance, which he calls saligenin-glucose, reduces Fehling's

solution (hence an aldose), and yet gives no osazone with phenylhydrazin.

H. V. A.

MANGANESE OXALATE FROM CITRIC ACID.

A concentrated solution of citric acid treated with a solution of potassium permanganate (the flask being kept in water to prevent heating above 40° C.) gives off carbon monoxide, and after four or five days deposits handsome rose-colored crystals, which analyzes to $MnC_2O_4 \cdot 3H_2O$. White crystals of $MnC_2O_4 \cdot 2H_2O$ are also obtained.

—(G. Deniges, *J. Ph. et Ch.*, 1900, 102.)

H. V. A.

SOLUBLE FERMENTS OF GERMINATION.

Sprouting seeds of fœnugreek yield, on maceration with water, a brown limpid liquid, which, when poured on seed albumen (of *Ceratonia siliqua*) warmed to 30° to 35°, converts it into a sugar that polarization figures and reactions show to be a mixture of mannose and galactose. The same was found true regarding the seeds of luzern, confirming previous work with the seeds of *ceratonia*. Hence, it is highly likely that seed albumen is rendered soluble in germination, through conversion by a ferment into glucose, just as diastase changes starch into dextrin and dextrose. That these ferments act as does diluted sulphuric acid is shown by the fact that substances leaving a residue on hydrolysis with the acid leave the same proportion of residue with the ferments.—(Bourquelot and Herissey, *J. Ph. et Ch.*, 1900, 104.)

H. V. A.

ALKYLTHIOSULPHONIC SALTS OF ALKALOIDS.

The alkaloids—notably berberine and morphine—react with potassium and sodium alkylthiosulphonates, forming handsome crystalline bodies, such as berberine p-toluol-thiosulphonate, $C_{20}H_{17}NO_4C_7H_7SO_2SH$, H_2O , and berberine β -naphthalin thiosulphonate, $C_{20}H_{17}NO_4C_{10}H_7SO_2SH$. The ease of crystallization suggests eventual use in alkaloidal assay, and as the alkaline salts of the alkylthiosulphonic acids decolorize iodine, as does sodium hypsulphite, they may lead to a simple volumetric alkaloidal assay.

A certain quantity of potassium β -naphthalin thiosulphonate is dissolved in water and an aliquot part titrated with centinormal iodine V. S. To an equal quantity, the berberine preparation is added, when precipitation occurs. The filtrate is titrated with centi-

normal iodine, and from the difference in the titration figures of the two solutions the amount of berberine is reckoned by the following factors :

One cubic centimetre $\frac{1}{100}$ n. iodine = 0.00262 gramme potassium β -naphthalin thiosulphonate.

One gramme potassium β -naphthalin thiosulphonate = 1.6927 grammes berberine hydrochlorate.—(Troeger and Linde, *Arch. Ph.*, 1900, 4.) H. V. A.

THE DYESTUFF OF ANNATTO.

This product yields bixin, which is best extracted by treatment with chloroform (using an invert condenser), the dried extract freed from fat by extraction in Soxhlet apparatus with ligroin, and the residue extracted in same apparatus with chloroform.

The crystals, obtained by evaporation and always finally dried, first on air-bath, then on water-bath, are further purified by successive treatment with ligroin and chloroform.

The pure crystals are violet-red, melt at 187.5° C., and have composition $C_{28}H_{34}O_5$. Zeissel's method, confirmed by Beckman's, shows that bixin contains one methoxyl group (OCH_3), but none of the hydroxyl group tests are answered.

Both reduction and oxidation break it into substances of no value in establishing its structural formula; the same being true of fusion tests (with potassa, etc.), and of treatment with concentrated nitric acid. Curiously enough, superheated steam splits palmitic acid from it.

It yields a phenyl hydrazine compound and a di-potassium salt, results so conflicting with analytical formula that its structure cannot be safely established as yet. Annatto contains no yellow dye-stuff, hence the so-called orellin of the earlier investigators is purely imaginary.—(K. G. Zweck, *Arch. Ph.*, 1900, 58.) H. V. A.

THE EMODINS OF ALOES AND FRANGULA.

These two bodies are isomeres, both being $C_{15}H_{10}O_5$, that is, trioxymethylantraquinone.

Aloe emodin melts at 223° C., dissolves in concentrated sulphuric acid with a red color, which gives a green-yellow color to water by pouring therein. A drop of the sulphuric acid solution added to water supersaturated with ammonia gives a reddish-violet color. Baryta water yields a rose-colored liquid with aloe-emodin. The

emodin also forms a benzoyl compound melting at 235° C., and a propionyl derivative melting at 152° to 153° C. Frangula-emodin melts at 250° , gives a concentrated sulphuric acid solution that becomes blue on dilution with water, and cherry red on saturating with ammonia. The emodin turns cherry red with baryta water, and gives a benzoyl compound melting at 225° C., and a propionyl compound melting at 121° to 122° C. A more exact differentiation between these emodins and that from rhubarb is being studied.—(O. A. Oesterle, *Schw. Woch. Ch. und Ph.*, 1900, 45.)

H. V. A.

PERFUMES—NATURAL AND ARTIFICIAL.

Though the proceedings at the annual meetings of the German Apotheker-Verein are chiefly directed to the discussion of pharmaceutical affairs, arrangement is generally made for affording an agreeable relief from the fatigue of the debates by the delivery, on one or both days of meeting, of an address on some subject of general scientific interest. This year, at the Stuttgart meeting, one of the addresses was delivered by Professor Schmidt, of that town, on the very interesting subject of perfumes, in which he not only gave a general description of present knowledge as to the chemistry of perfumes as they occur naturally and for the most part as constituents of plants, as well as a sketch of the ordinary methods of extracting essential oils and the other odorous constituents that are used in perfumery, but also an account of the more recent chemical discoveries which have led to the synthetical production of odorous substances upon a manufacturing scale of such magnitude and importance as to have suggested for the title of the address "The Competition Between Chemical Industry and Nature in the Production of Odorous Materials." Within recent years the improvement in the extraction of essential oils from various plants has been very considerable, and German manufacturers have been conspicuous in this respect by the adoption of vacuum stills of immense capacity—from 30,000 to 60,000 litres. By means of such improved appliances the possibility of extracting essential oils from materials containing only a very small amount has been so extended that, for instance, H. Hansel, of Pirna, shows at the Paris Exhibition a flask containing 100 grammes of solid oil of lime blossom of the value of £50, or about fifteen times as much as that of otto of rose.

Heine & Co. have likewise in that way been enabled to obtain and investigate the chemistry of the odorous constituent of jasmin.

The artificial preparation of compounds possessing a fragrant odor has been cultivated chiefly by the German firms Haarmann & Reimer, at Holtzminden; Hansel, at Pirna; Heine & Co. and Schimmel & Co., of Leipzig, with the aid of a number of chemists who have devoted themselves to this branch of investigation. The result has been the synthetic production of the odorous constituents of several kinds of fruit, of wintergreen oil, bitter almond, lilac, musk, woodruff, heliotrope, vanilla, rose, violet and many others. In several instances the methods originally adopted were either too costly, or, from some other reason, the products were regarded with too much suspicion to admit of any real competition with natural products; but with improved methods of production and better appreciation of the identity of the products with those occurring naturally, a very considerable industry has been created. Among the odorous constituents of fruit—generally consisting of esters—which are now manufactured on a large scale are pear oil, acetic isoamyl ester; pineapple oil, butyric ethyl ester, and apple oil, iso-valerianic isoamyl ester, all extensively used for confectionery purposes and in making liqueurs. Wintergreen oil, the favorite American perfume of *Gaultheria procumbens* and allied plants, contains 90 per cent. of salicylic methyl ester, and this artificially prepared compound is much used as a substitute for the natural oil. Bitter almond oil, or benzaldehyde, formed naturally from amygdalin by the action of emulsin, is now produced from toluene, which is first converted into benzal chloride; by treating that product with water or alkalis it is converted into benzaldehyde free from hydrocyanic acid. The separation of some residual chlorine in this product was successfully effected in 1894 by Heine & Co. Terpeneol, possessing the odor of lilac, obtained in 1888–91 by Wallach from turpentine oil by treatment with acetic acid and a mineral acid, was introduced into commerce by Haarmann & Reimer and Heine & Co. in 1889. Though the odorous constituent of musk has not been isolated, tertiary butyl trinitrotoluene—a yellowish crystalline substance discovered by Bauer—has the same odor and is largely manufactured for use in perfumery, under a patent, in Alsace. Coumarin, the chief odorous constituent of woodruff (*Asperula odorata*) occurs in many plants; formerly it was obtained

from tonka beans containing about 1.5 per cent., now it is largely produced by Perkins' method from salicylic aldehyde. In 1879 crystallized coumarin cost £12 a pound; now it is only about £1, chiefly in consequence of its production from *Liatris odoratissima*, an American plant containing it in large amount.

The odorous constituent of heliotrope has not yet been isolated; it is chemically related to piperine and to safrol, a constituent of Japan camphor oil, and it was obtained, as piperonal, by Haarmann & Reimer in 1879. The price was then about £75 per pound; in ten years it fell to nearly one-tenth, and it is now about a shilling. The odorous constituent of vanilla was first prepared artificially by Tiemann and Haarmann in 1872 from coniferin, a glucoside occurring in the cambial juice of *Coniferæ*, convertible by hydrolysis into grape sugar and coniferyl alcohol which yields, by oxidation, the aldehyde vanillin. Its manufacture was begun in 1874 by Haarmann, in Germany, and by De Laire & Co., in Paris, but it was attended with so much difficulty that only a very small quantity could be produced at a price in 1876 of about £175 per pound. However, Haarmann had observed that by treating coniferyl alcohol with melted potash it yields, among other products, eugenol, while Erlenmeyer found that eugenol heated with potassium permanganate yields vanillin, and Tiemann obtained a larger yield by acting upon acet-eugenol. In that way the price of vanillin was reduced to about £40 per pound. A further improvement by Tiemann was the use of isoeugenol, by which means the production has been increased to several thousand pounds a year, and the price per pound reduced to £5 or less, about one-thirtieth of the price of an equivalent quantity of vanilla containing 2 per cent. vanillin.

In connection with the odor of the rose, Professor Schmidt drew attention to the pale yellow oil imported from Algiers, Spain, the South of France, and the island of Reunion—and obtained by distilling varieties of geranium with steam—as consisting essentially of geraniol, an alcohol first prepared as an article of commerce by Heine & Co. This alcohol is also the odorous constituent of rose oil and of Indian palmarosa oil, obtained from *Andropogon schœnanthus*. In smaller amounts it exists in the East Indian citronella oil, obtained from *A. nardus* and *citratius*. Geraniol is frequently accompanied by esters—as, for instance, geranyl acetate in palmarosa oil, and in “petit-grains” oil. By oxidation it is convertible

into the aldehyde geranial, which is identical with the oil present in lemon oil, to the extent of 7 per cent., and first obtained by Schimmel & Co. as citral, as well as by Semmler from geranium oil. The closely related alcohol linalol and its acetate are important constituents of oils obtained from different kinds of citrus. Bergamot oil contains 40 per cent. of the acetate, orange flower oil as much, together with 30 per cent. linalol. The odorous constituent of the violet was formerly extracted by macerating the flowers in fat, or by exhausting the roots of *Iris florentina* with ether. Tiemann and Kruger found in this ether extract the glucoside iridin, and from it they obtained irigénin and iridic acid, as well as irone, a ketone possessing the violet odor. In 1893 the price of that substance was about £750 per pound, and only a few pounds were made yearly. But, guided by purely theoretical considerations, Tiemann and Kruger endeavored to obtain irone, or a similar isomeric substance, by the condensation of citral with acetone, and they succeeded in producing pseudoionone, an oily substance that, by heating with dilute mineral acids, glycerin and water, is convertible into an isomer—ionone—which has, like irone, a pronounced violet odor. The production of ionone then increased rapidly, and while a 10 per cent. solution cost formerly £25 per pound, the price of ionone is now much reduced.

Professor Schmidt concluded his very interesting account by pointing out that German chemical industry has taken the lead in the production of the materials for use in perfumery and pharmacy, the award of prizes to the four firms above mentioned, for their exhibits in Paris, being a convincing testimony to their capacity in that respect. So far as the production in quantity of certain odorous substances is concerned, it may be concluded that, though chemical industry has won in the competition with Nature, each succeeding scientific acquisition serves to show more distinctly how many-sided Nature is, how much richer she is in agreeable-smelling products than chemical industry, and how inevitable it is that Nature must remain our teacher.—Editorial in *Pharm. Jour.*, 1900, p. 325.

NICOTINE (0.0005–0.005 gramme) may be detected by adding a drop of formaldehyde solution (30 per cent.) and then a drop of nitric acid, when a crimson or dark red color is produced.

ALCOHOL VS. FOOD IN NUTRITION.

In closing an article on this subject (*Jour. Amer. Med. Assoc.*, 1900, p. 65), Dr. W. S. Hall gives some of the demonstrated facts which we possess regarding alcohol and food in their relation to nutrition.

ALCOHOL.

(1) A certain quantity will produce a certain effect at first, but it requires more and more to produce the same effect when the drug is used habitually.

(2) When used habitually it is likely to induce an uncontrollable desire for more, in ever-increasing amounts.

(3) After its habitual use a sudden total abstinence is likely to cause a serious derangement of the central nervous system.

(4) Alcohol is oxidized rapidly in the body.

(5) Alcohol, not being useful, is not stored in the body.

(6) Alcohol is a product of decomposition of food in the presence of a scarcity of oxygen.

(7) Alcohol is an excretion and, in common with all excretions, is poisonous. It may be beneficial in certain phases of disease, but it is never beneficial to the healthy body.

(8) The use of alcohol, in common with narcotics in general, is followed by a reaction.

(9) The use of alcohol is followed by a decrease in the activity of the muscle-cells and the brain-cells.

(10) The use of alcohol is followed by a decrease in the secretion of CO_2 .

(11) The use of alcohol is followed by an accumulation of fat through decreased activity.

(12) The use of alcohol is followed by a fall in body-temperature.

(13) The use of alcohol weakens and unsteadies the muscles.

(14) The use of alcohol makes the brain less active and accurate.

FOOD.

(1) A certain quantity will produce a certain effect at first, and the same quantity will always produce the same effect in the healthy body.

(2) The habitual use of food never induces an uncontrollable desire for it in ever-increasing amounts.

(3) After its habitual use a sudden total abstinence never causes any derangement of the central nervous system.

(4) All foods are oxidized slowly in the body.

(5) All foods, being useful, are stored in the body.

(6) All foods are the products of constructive activity of protoplasm in the presence of abundant oxygen.

(7) All foods are formed by nature for nourishment and are by nature wholesome and always beneficial to the healthy body, though they may injure the body in certain phases of disease.

(8) The use of foods is followed by no reaction.

(9) The use of food is followed by an increased activity of the muscle-cells and brain-cells.

(10) The use of food is followed by an increase in the excretion of CO_2 .

(11) The use of food may be followed by accumulation of fat, notwithstanding increased activity.

(12) The use of food is followed by a rise in body-temperature.

(13) The use of food strengthens and steadies the muscles.

(14) The use of food makes the brain more active and accurate.

EDITORIAL.¹

EDWARD ROBINSON SQUIBB.

Dr. Edward Robinson Squibb died at his home in Brooklyn, on the evening of October 25, 1900, after a short illness caused by the rupture of a bloodvessel of the heart. The unstable condition of Dr. Squibb's health and his steadily failing strength for some time doubtless prepared many for the news of his death. Dr. Squibb



led a strenuous life, characterized by the real manly instincts, honor and courage, and at the age of 81 he was the worn-out veteran. During nearly fifty years he, with a few others, some of whom are still living, has been making the history of American Pharmacy, and for nearly forty years he has been actively associated in Pharmacopœial work.

E. R. Squibb was born on July 4, 1819, in Wilmington, Del. In

¹ We hope to have an extended memoir of Dr. Squibb in a later issue.—ED.

1844 he graduated from the Jefferson Medical College, Philadelphia, and became Assistant Director of the United States Naval Laboratory at Brooklyn. (This JOURNAL, 1855, pp. 294 and 570.)

In 1857 (see this JOURNAL, 1857, p. 478) he resigned his position in order to accept the position of manufacturing co-partner in the firm of Thomas E. Jenkins & Co., of Louisville, Ky., known as the Louisville Chemical Works. It was with the understanding that this new establishment adhere strictly to the Pharmacopœia in the purity of their preparations that Dr. Squibb entered the firm. At this time Professor Procter said of him and this firm in an editorial note (*loc. cit.*): "He is well known as the uncompromising enemy of adulterated drugs and chemicals, come they from whatever quarter they may. We trust, with intention so fair, they may meet success and join our friends Powers & Weightman, Rosengarten & Sons and other houses, in developing the resources of this great country and stopping the influx of foreign chemicals." At the end of the year, however, Dr. Squibb disconnected himself with this firm and made arrangements (this JOURNAL, 1859, p. 186) for "opening a laboratory in Brooklyn for the supply of pure pharmaceutical chemicals, and in advance had received the patronage of the medical department of the U. S. Army, for the supply of chemicals, etc., of a quality equal to those prepared at the Naval Laboratory. This establishment was just getting under way when a slight accident, big with disaster, swept it from existence, and prostrated its proprietor, a sufferer." In this JOURNAL, 1859, p. 186, will be found a few lines from a letter received by Professor Procter from Dr. Squibb giving some details of the accident and also describing the injuries which he received. Again the character of the man was manifested, for he did not become disheartened, but had his laboratory rebuilt immediately and even while convalescing made the drafts for it, and in concluding the communication referred to he said that he hoped soon to "be again under way with renewed energy and determination of purpose."

He did continue and persevere and in spite of similar experiences developed an ideal manufacturing establishment, and his life stands as a model for every youth who would be successful. He not only put his mind and his unflinching industry into his work, but also his conscience, and as this latter feature became known, the products of his laboratories were widely specified by physicians and demanded in the arts.

One of the earliest papers of Dr. Squibb is published in this JOURNAL, 1855, p. 294, entitled "Preparation of Citrate of Iron and Quinia and its Constituents." The paper and the subsequent controversy with one of the most successful manufacturers of chemicals in this country revealed the character of the man, in that he says: "It is the cause and interests of medicine and pharmacy that I wish to defend;" yet at the same time one cannot but see a kind of method which is characterized by Professor Procter (*loc. cit.*, p. 480) as being well intentioned but "calculated to injure the deservedly excellent reputation of the manufacturers." It was this openness of mind together with courage that made him at once the champion of pure drugs, chemicals and preparations; that caused him to be feared by friend and foe alike, and deprived him possibly of some honors that a more compromising or tactful champion, or one less actively conscientious, might have received.

In 1858 Dr. Squibb became a member of the American Pharmaceutical Association and that year contributed a paper on "Notes and Suggestions upon Some of the Processes of the U.S.P., Especially Directed to the Committees of Revision" (see Proc. A. Ph. A., 1858, p. 386). This paper is a model of its kind and contains numerous practical suggestions which have been incorporated into the Pharmacopœia. It was this same year that he was honored with the office of First Vice-President by the Association. In the following year he was appointed upon the Committee on Home Adulterations, on which he served until, in 1862, this committee was discontinued and the Committee on Drug Market was originated, of which he was the first chairman (Proc., 1863, pp. 175-195).

Many of the papers of Dr. Squibb show that he had unusual mechanical ability, and there is no doubt but that this ability, with his natural spirit of getting at the bottom of every question that came to him for solution, made him a successful manufacturer. One of his earliest papers showing his mechanical ability is on "The Official Preparations of Metallic Mercury with a Mercurial Machine," and is accompanied by an engraving (Proc., 1859, p. 359).

In 1860 he was appointed to investigate and report upon the following query at the meeting in 1861: "What is best form and material for a still for the pharmacist's use, of from two to four gallons capacity, appropriate for heating by gas or stove heat, which shall combine economy with efficiency and fitness?" He wrote valuable

papers upon the economy of alcohol in percolation, repercolation, and devised apparatus of all kinds for carrying on pharmaceutical manipulations and chemical and urinary analyses. His knowledge of physics and chemistry, together with his mechanical ingenuity, enabled him to foresee practical difficulties that inventors of new apparatus did not seem to have taken into account. (See Proc. A. Ph. A., 1865, p. 75.)

The papers published by Dr. Squibb were numerous indeed. In the AMERICAN JOURNAL OF PHARMACY alone over 100 papers have been published since 1857. The last of these was published in July of this year. An examination of these papers shows that the subjects which he selected were those of fundamental importance in pharmacy. Besides this work in original papers, Dr. Squibb contributed much of his time and valuable services on various committees of the A. Ph. A. It was Dr. Squibb who, in 1863 (Proc., p. 42), offered a resolution for the appointment of a Permanent Committee on the Pharmacopœia of the A. Ph. A. The usefulness of the labors of this committee has seen its fruition in the various sub-committees of the Committee of Revision of the U.S.P. In 1866 (Proc., p. 88), as chairman of the Committee on the Internal Revenue Law, he made an extended report, which may be considered even to-day worthy of the careful study of those who are interested in such subjects.

Dr. Squibb was among the first to appreciate the necessity of the study of the quality of drugs. His "Note on Rhubarb" (Proc., 1869, p. 398) is an admirable essay, showing the responsibility of the pharmacist in buying drugs and making preparations therefrom. It contains a lesson which has been learned well by a few successful pharmacists and manufacturers, but the great rank and file have not appreciated the fine points, and the result has been that physicians who at first prescribed a few of the special products of manufacturers because they knew the care and attention which was being devoted to their manufacture, now are specifying certain manufacturers' products for nearly all the ingredients which they need in their prescriptions. This will be done until pharmacists generally learn the lesson that cheap goods are generally poor in quality, and that to shift the responsibility upon some one else is not to their credit, and that, furthermore, brains and ability must be coupled with conscience and industry in the making of every medicament prescribed by the physician or called for by the people.

Dr. Squibb gave no thought to the opinions of men. The fear of disapproval of his fellows held him no more than did the love of praise or commendation. He recognized his responsibilities in one of the most responsible of all the walks in life. He never substituted the *seeming* for the *being*. He was the conscientious worker with a purpose, and he worked and lived without deviating from and without tiring of attaining the end he had in mind. He was successful in the best use of this word, and stands as one whose life and work is deserving the careful study and reflection of every pharmacist who would fulfil the obligations of his calling.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

QUANTITATIVE CHEMICAL ANALYSIS, ADAPTED FOR USE IN THE LABORATORIES OF COLLEGES AND SCHOOLS. By Frank Clowes, D.Sc., Lond., and J. Bernard Coleman. Fifth Edition. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1900.

The expression "adapted for use in the laboratories of colleges and schools" used here must be used understandingly. No manual of quantitative chemical analysis, not even the large Fresenius, with its 900 pages, will enable the student to get along without the attention and supervision of an experienced instructor. Much less will a book, which, in less than 600 pages, covers volumetric and gravimetric inorganic analysis, organic analysis, gas analysis, water analysis, and a series of special technical methods, serve without very considerable personal supplementing. With this reservation, however, we can commend the book as being thoroughly up-to-date in its selection of material and thoroughly scientific in its method of presentation of the same.

Part I of the book, covering the first eighty-three pages, is given to instruction in the use of the analytical balance, determinations of specific gravity, melting and boiling point, the preparation of materials for analysis, treatment of precipitates, and general rules for working and for the calculation of results.

Parts II and III are devoted to simple gravimetric estimations and volumetric analysis respectively, and merit no especial mention. Part IV, covering 220 pages, is the most valuable part of the work for reference, as it discusses methods of technical analysis, both

inorganic and organic, illustrated by numerous practical examples. This part has included many valuable methods, such as the electrolytic methods for several of the metals, silver, gold and lead assays, calorimetric value of coals, and analyses of milk, butter, spirits, sugar, tea, tanning materials, and soaps.

Part V is devoted to gas analysis, and includes the Hemfel methods, the use of Lunge's nitrometer, and methods of vapor density determinations.

The last thirty-four pages (Part VI) give the results of a number of typical analyses in tabular form, and a series of tables of useful constants for reference.

The book is, as before stated, a very convenient and compact reference book to turn to in connection with the instruction of a laboratory teacher, and will undoubtedly be of a useful character.

S. P. S.

INCOMPATIBILITIES IN PRESCRIPTIONS. By Edsel A. Ruddiman. Second Edition, Rewritten. 8vo. 312 pages. Cloth, \$2.00. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1900.

The book is divided into two parts. Part I treats of Incompatibilities and Part II treats of Prescriptions with Criticisms. Part I has been entirely rewritten. The substances treated are arranged in alphabetical order according to their Latin names and the text is replete with information concerning the subject of Incompatibilities. Over 300 prescriptions are given with criticisms. A table of solubilities has been added. A complete index of prescriptions is given which will enable any one to find at a glance any prescription containing a certain ingredient or combination of ingredients that are likely to be encountered in practice. Taking the book as a whole, while it may seem intended primarily for students in pharmacy and medicine, it is one that the practicing pharmacist will find of service, as it contains much valuable information and many practical hints.

VICTOR VON RICHTER'S TEXT-BOOK OF INORGANIC CHEMISTRY. Edited by H. Klinger. Authorized Translation by Edgar F. Smith, assisted by Walter T. Taggart. Fifth American from the Tenth German edition. Carefully revised and corrected. With sixty-eight illustrations on wood and colored lithographic plate of spectra. Philadelphia: P. Blakiston's Son & Co. 1900. Price, \$1.75.

The translations of Richter's text-books on chemistry by Edgar F. Smith have always been opportunities for the author to add the more important recent and well-established discoveries in chemical science. The fifth American edition contains additions relating to the general properties and the measurements of gases in the atmosphere; a concise treatment of the new atmospheric gases recently discovered; and valuable information on the theory of dilute solutions and electrolytic dissociation. The fifth edition is an up-to-date, concise and valuable work of Inorganic Chemistry.

A MANUAL OF MATERIA MEDICA AND PHARMACOLOGY. By David M. R. Culbreth. Second Edition, enlarged and thoroughly revised. With 464 illustrations. Philadelphia and New York: Lea Brothers & Co.

This work consists of a general part treating of posology, causes modifying dosage; modes of administration of medicines and a classification of medicines. In Part I the organic drugs from the vegetable kingdom are considered. Part II is devoted to a consideration of organic drugs from the animal kingdom. Part III treats of the inorganic drugs from the mineral kingdom; Part IV, of the organic carbon compounds, and part V, of the non-pharmacopœial organic carbon compounds. Then follows the treatment of the microscope and its use in materia medica; the treatment and antidotes of poisons; prescription writing of the physician; tables of weights, measures, doses, drops, thermometers, abbreviations and constituents.

The book contains much valuable information and will be found a useful handbook to students and a valuable reference book for pharmacists.

MINUTES OF THE PHARMACEUTICAL MEETING.

The second of the present series of pharmaceutical meetings of the Philadelphia College of Pharmacy, for 1900-1901, was held on Tuesday, November 20, 1900, in the Museum of the College. W. L. Cliffe, a well-known pharmacist of this city, presided. The first speaker was Frederick T. Gordon, who read a paper on "An Improved Process for the Preparation of Tinctura Opii Deodorati" (see page 576). The preparation of this tincture has been long a

matter of interest and aroused quite a discussion. Mr. E. M. Boring said that the process suggested by Mr. Gordon was very similar to one originated by Mr. Rother, who suggested, however, the use of spermaceti and vaselin (this JOURNAL, 1883, p. 76). This process was subsequently applied by Mr. Sloan, of Indianapolis, who reported that in the examination of a preparation made from an opium assaying 13 per cent. the finished tincture only contained 7 per cent. of alkaloids. Mr. Rother subsequently showed that the loss in alkaloids was apparently due to the manner of manipulation.

Mr. Cliffe asked if the process suggested using paraffin in place of ether removed the narcotin and other objectionable principles as ether does. In reply Mr. Gordon said that he had not tested the finished preparation in this way, but the sample which he submitted prepared by this method would indicate that the objectionable principles were removed. Dr. Lowe said that the fact that laudanum had certain disagreeable effects, while the deodorized tincture of opium had not, led us to consider narcotin to be the deleterious principle. Mr. Gordon remarked that from his own personal experience narcotin did not seem to cause nausea, as he had himself taken one-half grain of narcotin without suffering any ill effects, which led him to believe that the objectionable principle was probably of a volatile character.

Mr. Cliffe said that from the discussion it would seem that a denarcotized opium should be used in the manufacture of all opium preparations. Mr. David H. Ross asked if there was any objection to using denarcotized opium placed on the market by manufacturers in the preparation of *tinctura opii deodorati*, and remarked later in the discussion that when one took into consideration the time and material required in making the official preparation it was no more expensive than the official method. Mr. Cliffe remarked that in his experience a tincture made from denarcotized opium was not as satisfactory as that made by the official process. Mr. Boring said that he once obtained a denarcotized opium which made a preparation that had an exceedingly disagreeable odor.

Mr. Gatchel asked why old opium pills do not seem to nauseate patients, and said that he knew several physicians who desired pills of opium that had been made for some time. Mr. Wiegand said that when he was in the navy yard in Brooklyn the oldest opium in stock was used for making the pills. It was incidentally re-

marked that Mr. Boring had pills of opium in stock which were twenty years old. It was finally brought out that the object of prescribing old opium pills was not so much due to the fact that they did not induce nausea because of a loss of nauseating principles, but rather to the fact that they are less easily dissolved and do not have an effect until they reach the intestines.

Mr. Wiegand furnished some interesting notes connected with the history of the preparation of the deodorized tincture of opium. He said:

“The interest that attaches to this subject is quite remarkable, as it has been the title of a paper by Dr. Robert Hare, the eminent chemical philosopher, who was for many years professor of chemistry in the University of Pennsylvania, and published in 1828, in the preliminary numbers of the *AMERICAN JOURNAL OF PHARMACY*. Medical men have long felt the need of a remedy that would give the relief that opium affords to many persons without producing the nauseous and depressing after-effects so often noticed by those who have used laudanum. The earliest of these, so far as I have noticed in the journals written in the English language, is Battley's Sedative Solution. A formula which is said to yield a similar preparation is published in the eighth volume, *AMERICAN JOURNAL OF PHARMACY*, which shows it to be an aqueous solution of opium preserved by some spirituous menstruum—no other care being taken to keep it free from the noxious principles of opium but that of using aqueous menstruum only to exhaust the drug. The next preparation which attained any wide notoriety for the same purpose was McMunn's Elixir of Opium, the formula for which was found among the papers of Dr. James R. Chitton, an analytical and consulting chemist of New York, who was made acquainted with the formula and gave a certificate stating it was free from the objections common to the ordinary tincture of opium.

“Mr. Duhamel, a pharmacist of this city, published a formula for a tincture of opium, which he stated his preceptor, Mr. Elias Durand, a noted French apothecary, then located at southwest corner of Sixth and Chestnut Streets, used, and that those who used it found it free from the disagreeable effects of ordinary laudanum.

“In the *AMERICAN JOURNAL OF PHARMACY* for 1860 Dr. Squibb communicated the results of his experiments on opium solution, giving the most minute details of his process, so that any person

even possessing but little skill might succeed in making a preparation that would give satisfaction.

"This preparation, liquor opii compositus, was a solution valuable because the noxious ingredients of opium were excluded by exhausting with water, washing it with ether, and Hoffman's anodyne was finally added as a preservative and also added its remedial properties to the preparation. After ten years' experience Dr. Squibb thought it was better, for the majority of cases, to omit the Hoffman's anodyne, as it affected so many people unpleasantly, producing sickness of stomach, nausea, etc. The sale of this preparation increased ten times as fast as that of the deodorized tincture of opium.

"Professor Patch made some very careful experiments on the preparation of the deodorized tincture of opium, which will be found in the volume of the *AMERICAN JOURNAL OF PHARMACY*, page 552, for the year 1898, and contains a tabular statement of the various solvents for the principal alkaloidal constituents of opium, and it shows that some of those that had been recommended for the removal of the narcotin and oil resinous matters contained in opium are almost worthless; but from an examination of the table it appears that a small portion of chloroform-ether would be the best solvent for the narcotin that was taken up by the water in exhausting the opium, as it appears that three parts of chloroform are all that is required to dissolve one of narcotin. This same solvent power seems to hold good in respect to the meconate of morphia, which will preclude its use even in small quantities as a means of removing the narcotin.

"To any one who desires to fully master the subject of making this preparation, he can find no better source of information than that contained in the papers of Dr. Squibb and Professor Patch."

Mr. Wiegand also exhibited a device, which was in the nature of a separating apparatus, for removing the ether from the tincture.

Mr. Gordon thought the apparatus of Mr. Wiegand was not only desirable for this process, but might be employed in drug analysis; that its cheapness and ease of construction made it an ideal separator.

Mr. C. Carroll Meyer has found that the process of the 1880 U.S.P. is the most satisfactory for making the deodorized tincture of opium.

The next paper was a comment on the new German Pharmacopœia, and presented by Martin I. Wilbert. (See p. 563.) Mr. Cliffe

commended the paper and said that one of the needs suggested by the comparison of the several Pharmacopœias was the necessity of uniformity in some of the more potent remedies.

Dr. Lowe remarked that one of the deductions to be drawn from this paper was the necessity for an international Pharmacopœia. Mr. Beringer said that in looking over the new German Pharmacopœia there were several things which impressed him, viz.: There were some additions of substances which were practically unknown in this country, as *hydrastinum hydrochloridum*, *arecolinum hydrobromicum*. They have fixed definitely several points—for instance, they recognize the basic bismuth salicylate. It was furthermore interesting to note that they had not heretofore recognized the oil of sandal wood, the chemistry of which had been so well worked out by German chemists and which has been so largely used in the United States. Among omissions he mentioned the following: Musk and tincture of musk; the absence of any chemical formulæ; the omission of potassium acetate, although a solution of the salt is recognized.

He also noted that tincture of *strophanthus* was a 10 per cent. tincture and made with dilute alcohol; that there were comparatively few vegetable drugs, as of barks for instance, but ten are recognized, and of these several are of little value, as *cascarilla* and *condurango*, and that it seemed strange that *casgara sagrada*, which is so extensively used here, is not recognized by them. In the matter of the botanical origin, the authorities of the U. S. and German Pharmacopœias seemed to be more progressive than Great Britain.

Professor Kraemer, in commenting on the German Pharmacopœia, said that a bold step was taken in dropping the authors' names from all, but possibly one, of the vegetable drugs. This would not have been so radical if there had been incorporated in another part of the Pharmacopœia an official list of names of plants yielding the drugs with the author's name.

The next was a communication by Lyman F. Kebler on "So-called Lithium Bicarbonate." (See p. 580.)

Mr. Ferdinand A. Sieker, of New York City, sent a valuable and interesting paper on Warburg's tincture, which was presented in the absence of the author by Professor Kraemer. This paper is printed in full in another part of this JOURNAL. (See p. 571.)

Among specimens exhibited were a sample of ammonium nitrate, sent by Mr. Kebler, and a specimen of socotrine aloes in a monkey skin from Lehn & Fink, of New York City.

A NEW BOOK.

STRINGTOWN ON THE PIKE, the new story by John Uri Lloyd which was selected as *The Bookman* serial for 1900, is an unusually interesting one. The scene of action is chiefly in one of the villages in Northeast Kentucky. There are two marked characteristics displayed by the author in the book: (1) The training of the scientist, who is as eager to describe the habits, morals and language of a people as he would be to describe the trees and rocks of the locality in which they live. (2) There is no waiting for shifting of scenes; but the book is characterized by a continuity of action that is pleasing, and which reminds one of a series of moving pictures. In both these respects the author has shown an originality and a power that is only equalled by the story he has told. The story itself is interesting in several ways, particularly to the scientist and investigator. It shows that the man of science with his faith in human authority may be as much of a fanatic and as likely to err in his judgment as the ignorant, superstitious slave bound to his signs and omens; that the latter have been in the nature of Divine agencies, correcting evils, checking vice and developing a race which saw its best type in old Cupe, who always recognized the Divine hand and who has shown that "de Lawd am biggah dan de law."

The story throws a new light upon the African Ordeal Test as carried out by some of the old negro tribes of Africa, and seems to have been perpetuated by some of the negroes of the South. It would appear that the king or the son of a king read the character of his people and knew in more ways than one the guilt or innocence of the person brought before him and his court of justice. They knew full well when to administer the ordeal test, and it would seem no less uncertain than the jury who would pronounce the death sentence upon the testimony of an expert chemist, Professor Drew, swearing that he had found strychnine in the stomach of the deceased when strychnine was not present, although a strychnine-like reaction was subsequently proven to be obtained from the use of a mixture of hydrastine and morphine.

The careful analysis of the language, habits and morals of the Southern negro and of the primitive Kentucky mountaineer alone would give this book a lasting place among historical books. There are certain chapters, however, as "Red-Head's Story of the Feud," "Why the Honey-Bee Don't Suck Red Clover," "New Year's Eve, 1863," and "Into the Storm Passed the Minister," which should become part of our school readers, and like the selections of Dickens and others, become a part of every schoolboy's life. John Uri Lloyd has done a very commendable piece of work in his "Stringtown on the Pike," and it is doubtful if it has been surpassed by many modern American writers.

HYGIENE OF TELEPHONES.—A commission has been appointed in France to study the question of the contraction of contagious diseases from the promiscuous employment of the instruments by all classes of the public. It has been supposed that the syphilitic virus from the mouth of a patient in the contagious stage might be left behind when using the instrument, and is, therefore, considered (*Pediatrics*) wise for users of the telephone to avoid absolute contact with the instrument anywhere except with the hands.



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NOTES AND NEWS.

DESTRUCTION OF THE J. B. LIPPINCOTT COMPANY'S ESTABLISHMENT BY FIRE.—In a very disastrous fire which occurred in this city on November 29th, this large publishing house was completely burned out. Among the publications issued by this firm are the U. S. Dispensary, Remington's "Practice of Pharmacy," and Sadtler and Trimble's Chemistry, and also other well-known pharmaceutical works. The plates of Remington's Pharmacy were saved without injury and a new edition will be out in a few weeks. A few of the plates of the Dispensary were destroyed, and a new edition of this work will be out as soon as possible, as also the Text-Book of Chemistry. That the paper was ordered for the new editions of these works while the fire was still burning, shows the promptness and energy with which this loss will be repaired.

Notwithstanding the great loss which the J. B. Lippincott Company sustained in the destruction by fire of their entire plant, except perhaps the plates, the energy which they have shown is remarkable. They at once secured the building 624 Chestnut Street, Philadelphia, where they have furnished handsome offices, their entire clerical force being actively at work. Arrangements are also being made for a new manufacturing building, to be occupied during the reconstruction, on a thoroughly modern scale, of the premises they formerly occupied. New supplies of the latest types are being purchased, and the standard of taste and excellence for which the Lippincott books have been famous will be maintained and developed. Early in the coming year they hope to have ready a full stock of their important books, and they are always open for the consideration of manuscript.

AWARDS OF THE NATIONAL EXPORT EXPOSITION.—The medals and diplomas awarded by the judges of the Exposition have been announced, and among those recognized were the following well-known drug, food and chemical manufacturing and importing houses: Mellor & Rittenhouse, licorice and its preparations; Rosengarten & Sons, chemicals; Smith, Kline & French Company, chemicals, pharmaceuticals and food products; Wm. R. Warner & Co., pharmaceutical preparations; John Wyeth & Bro., pharmaceutical preparations; Barrett Manufacturing Co., chemicals; Wm. B. Burk & Son, sponges; A. Colborn & Co., food products; H. K. Mulford & Co., pharmaceutical preparations; Pennsylvania Salt Manufacturing Company, chemicals, all of Philadelphia; Keasbey & Mattison Company, Ambler, Pa., chemical and pharmaceutical products; Horlicks Food Company, Racine, Wis., food products; Seabury & Johnson, New York, medicinal and surgical specialties; and the Welch Grape Juice Company, Westfield, N. Y., grape juice.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The following announcement is made at the request of Charles Caspari, Jr., General Secretary of the Association:

At the forty-seventh annual meeting of the American Pharmaceutical Association, held at Put-in-Bay, O., September 4-12, 1899, the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association and the General Secretary was instructed to inform annually the Local Secretary and the Pharmaceutical Press of this resolution.

INTERNAL REVENUE TAX.—The Committee on National Legislation of the N. A. R. D. has prepared an address to the members of Congress urging the repeal of the internal revenue tax on medicines. This was ready for distribution previous to the holiday vacation, during which it was expected every senator and representative would be importuned by his druggist constituents not only to vote for the measure, but to work to secure its passage.

EXPORTS OF COD LIVER OIL FROM NORWAY.—Only once before—in 1893—has Lofoten Cod Liver Oil been cheaper than it is this year. For this reason, and also on account of the fine quality of the oil this season, the exports of the article from Norway to foreign markets have been unusually large.

PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS.—During the winter a series of social meetings will be held by this association, and the first entertainment, which will be progressive euchre, is announced for about January 23d. Every druggist in the city is invited to participate. For particulars, address the Secretary of the Entertainment Committee, Mr. C. H. Campbell, Eighteenth and Market Streets.

SALOPHEN is a derivative of salicylic acid which is claimed to be devoid of any irritating effects upon the stomach, and of the systemic effects upon the heart and nervous system so often associated with the use of the salicylates. Passing unchanged through the stomach, salophen is split up in the intestinal canal, with the liberation of salicylic acid in a nascent state and acetylparaamidophenol. While to the former constituent is due the antirheumatic effect of salophen, the latter is responsible for its antipyretic and analgesic effects. Acetylparaamidophenol closely approximates phenacetin in action. According to the investigations of Dr. F. Goldmann (*Pharmaceutische Zeitung*) acetylparaamidophenol in the nascent form is an excellent remedy for reducing temperature and alleviating pain, being perfectly harmless. It is well tolerated by animals and human beings even in large doses. Owing to the combined action of these constituents, salophen has gradually gained a much wider field of utility than was originally anticipated. Although at first almost completely utilized in the treatment of rheumatism, it is, to a great extent, taking the place formerly occupied by other synthetic remedies.

SOLID HYDROGEN.—According to the *Comptes rendus* (129, 434) H. Moissan has read before the Académie des Sciences a short note on solidified hydrogen, by Professor Dewar, giving further particulars of his remarkable experiment. The appearance of the solidified element is likened to white foam (*écume*) or to a mass of transparent glass. It melts at about 16° on the absolute scale, which is equivalent to—257° C. Pure helium undergoes a change of state when it is cooled by means of solid hydrogen and subjected to a pressure of eight atmospheres. Seeds, after they are frozen in liquid hydrogen, retain the power of germinating. This communication is of great scientific interest, inasmuch as hydrogen is now known to be non-metallic in the solid state, contrary to the conjectures which have been largely entertained hitherto. Further, the approach to the zero of absolute temperature, slow though it is, is steadily going on. Two months ago Dewar arrived within 21° of it, and now only 16° separate him from his goal. Will he attain it?—Abstract in *Pharmaceutical Journal*, September 16, 1899.

NOTES AND NEWS.

DR. DANIEL G. BRINTON'S memory was honored by the representatives of twenty-six American societies, of which he was a member, in the hall of the Historical Society in Philadelphia on January 16th. A handsome portrait was presented by his friends, a complete set of his works by his family, a bronze medal in relief of his portrait by the Numismatic and Antiquarian Society to the American Philosophical Society, of which he was such a distinguished member.

The memorial address was given by Prof. A. H. Smyth, who said in part :

"In his own particular field of American ethnology, Dr. Brinton was without a peer, but he was almost equally eminent in many other varied pursuits. He was steeped in the classics. One of the most remarkable things about him was his many-sidedness. His vision was all the clearer for this. In the forty years of his activity, Dr. Brinton wrote twenty-three volumes, and a vast number of pamphlets and brochures. His contributions to the current publications were equally numerous.

"His work of the 'Library of American Aboriginal Literature' gained him a place among the first archæologists of the world. He was not a sequestered scholar; he loved his brother men. As a friend he was charming and loyal. His friends loved him; he never disappointed or repelled. In his death science sustained a heavy loss, but to his friends his loss is irreparable."

SIR WILLIAM DAWSON, who died at Montreal on November 19, 1899, was the "last survivor of that distinguished group of naturalists which, in the earlier part of this century, achieved for science in America such brilliant results and such widespread recognition."—*Science*, 1899, p. 905.

PROFESSOR VIRCHOW'S JUBILEE.—The fiftieth anniversary of Rudolf Virchow's tenure of office as Professor Ordinarius was recently celebrated in the Pathological Museum (Virchow's own creation) in the University of Berlin. In the elaborate address which was prepared, it was said "that the roots of your strength lie in your work as a German Professor, and ever the 'Professor' has been foremost in you." In replying, Virchow said that it was true that his chief feeling had ever been that of the "Professor." In cases of conflicting interests he had always chosen the course of "Professor."—*Ibid.*, p. 940.

SIR JAMES PAGET, one of the most famous English surgeons of the century, died in London on December 30th. He was eighty-six years old. In 1836 he became a member of the Royal College of Surgeons, and in 1843 was made an honorary Fellow of that institution. Sir James made many contributions to science, among which are the "Pathological Catalogue of the Museum of the College of Surgeons," "Report on the Results of the Use of the Microscope," and "Lectures on Surgical Pathology." He contributed frequently to the "Transactions" of the Royal Society, of which he was a Fellow, and of other scientific bodies. In 1875 he was elected President of the Royal College of Surgeons, and from 1884 to 1895 was Vice-Chancellor of the University of London. Many other honors were accorded him during his lifetime. In 1871, in recognition of his humanitarian work and of his many discoveries in surgery, he was created a baronet.—*Med. News*, 1900, p. 31.

THE PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS will give a grand progressive euchre and dance at Horticultural Hall, on Wednesday, February 7, 1900. There will be 150 handsome prizes distributed. The object of the entertainment is to create an interest in the association and its work. It is desired that every druggist in Philadelphia take an active interest in the affair and assist in making it a success. The officers of the committee are: Chairman, D. M. Harris, 4000 Girard Avenue; Secretary, C. H. Campbell, 1800 Market Street; Treasurer, H. C. Blair, Jr., 800 Walnut Street.

A NEW DRUG JOURNAL.—The first issue of *The Northwestern Druggist*, a monthly publication devoted more especially to the interests of the druggists of the Northwest, made its appearance the early part of December. It is in magazine form and is under the direct management of the Chapin Publishing Company, of Minneapolis.

THE BOOKMAN, one of the best literary magazines of this country, will contain in about ten numbers, beginning in March, Prof. John Uri Lloyd's story, "Stringtown on the Pike." This story will interest not only those who know Professor Lloyd, but the members of our profession as well, as in one place he touches on a problem that cannot but come home to every physician and pharmacist. The novel treats of Kentucky life as seen by the author in a little and undiscovered corner of the State. It ought to be more generally known that there is probably no greater opportunity for any author in literature than the study of Southern life. There is a something markedly individualistic and attractive in the Southern American. His traditions and life are peculiarly idealistic when his motives and objects are understood, and it is questionable if a work has been produced recently which is equal to Lloyd's "Stringtown on the Pike" as a literary production, and particularly as a truthful reproduction of the life of one of the most interesting classes of primitive people in America to-day. We cannot but regard it as being important, that in the history of a country we have a faithful portrayal of the life and habits and motives of its people. Our faith in American literature is strengthened by the entrance into it of professional men like Weir Mitchell and John Uri Lloyd. The proceeds of this new book will, like those from *Etidorhpa*, be devoted to the Lloyd Library, which is a free public library, and is pledged to be donated intact to that university best calculated to serve science.

THE NATIONAL PURE FOOD AND DRUG CONGRESS will hold its third annual meeting in Washington, D. C., at Columbian University Lecture Hall, beginning at 12 M. on March 7, 1900.

THE PURPOSE OF THE N. A. R. D.—In one form or another the question is constantly being asked, "What is the N. A. R. D. for?" Much of the correspondence that goes out from the national secretary's office relates to this question. The following is a sample reply: "You ask in your letter the 'object of forming an organization.' To answer briefly and directly, the main object is to put money into your pocket and the pockets of the other druggists of your county, by saving their business from impending demoralization. If this department store at ———— keeps on doing business it will not be long before the druggists of your own town will find their revenues diminishing perceptibly, and it is this we would like to prevent. It is difficult to conceive how any question could appeal to you with greater force."

NOTES AND NEWS.

THE NINTH INTERNATIONAL PHARMACEUTICAL CONGRESS will be held in Paris from August 2 to 8, 1900, at the École supérieure de Pharmacie de l'Université de Paris, Avenue de l'Observatoire, 4. The President of the Committee on Organization is G. Planchon, Avenue de l'Observatoire, 4, Paris; the Secretary, G. Crenvin, Rue Turenne, 45, Paris. The membership fees are, for *membre effectif*, 20f. and for *membre donateur*, 100f. The Congress will comprise four sections: (1) general pharmacy and pharmaceutical chemistry; (2) materia medica and pharmacognosy; (3) biological chemistry, bacteriology and hygiene; (4) professional interests. The various pharmaceutical societies are doing their utmost to make this a memorable meeting, and, in addition to the Exposition, there will be a most pleasing event in the unveiling of the monument to Pelletier and Caventou.

THE FIRST INTERNATIONAL CONGRESS ON MEDICAL ETHICS is to open on July 23d, at Paris, and is under the patronage of the French Government. It is to be essentially a congress of practitioners, and appeals especially to national, state and county medical associations. It concerns all who are interested in the economic and ethical details of the profession. For further information, see *Jour. of Med. and Sci.*, 1899, p. 33.

THE INTERNATIONAL CONGRESS ON MEDICAL ELECTROLOGY AND RADIOLOGY will hold a meeting in Paris this year, from July 27th to August 1st. For information address Prof. E. Doumer, General Secretary, 57 Rue Nicolas-Leblanc, Lille.

PRACTICAL PHARMACY AND DISPENSING.—Since the foundation of the scientific section of the A. Ph. A. in 1887, there has been a decided scientific tendency in the work of this section, more attention being given to the elucidation of problems requiring for their solution expert botanists or chemists, rather than retail pharmacists. Very naturally there would be a feeling in the Association that the retail pharmacist is not so active as he once was, and that there is a need for a committee having for its care the accumulation of all data of a practical nature. The language of the Committee on Practical Pharmacy and Dispensing of the A. Ph. A. leaves no doubt as to what they want and from whom they want this information. They say:

"Everywhere, to-day, there seems to be keen relish for common sense, practical matter, and this is what this Committee wants from you, Mr. Pharmacist—something you know to be good; something you have tried; something you have proven. No matter how plain or commonplace, if it is of a positive quality, we want it. Again, we want what you do not know, what you would like to know, and what you can't find out. If it pertains to your business, and would be helpful, we want it. We want, practically, everything pharmaceutical; what you have, and what you want.

"The Committee requests you to keep diaries of your professional work. Write up one or two busy days, noting each movement of interest; tell what you did, and how you did it.

"Queries are also very desirable; we will try to answer them. While we prefer that prospective writers of papers should select their own subjects, the Committee will offer these if requested to do so."

THE PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS held recently, as was announced, their first progressive euchre and dance. Nearly 2,000 persons were present, and over 225 prizes were distributed. Mayor Ashbridge of the city made some happy introductory remarks, and, owing to the fact that the movement was supported by the prominent pharmacists of the city, it was expected that the entertainment would be an eminently successful one, and this hope was more than realized.

PLANT PSYCHOLOGY.—In a most interesting article by E. Küster (*Apoth. Zeit.*, 1899, pp. 448 and 458) is given a digest of the most important literature bearing upon the problem as to whether plants have souls. The whole problem is one intimately connected with philosophical psychology and opens up a most interesting field of speculation. The important contributions on this subject are those of G. T. Fechner, entitled "*Nana oder Ueber das Seelenleben der Pflanzen*;" Martiu's upon "*Die Seele der Pflanzen*" and Dr. Wille on "*Waldseelen*."

COMMERCIAL EDUCATION IN THE UNITED STATES is considered in the *Amer. Gas Light Jour.*, 1898, p. 897. Almost all of the larger universities are recognizing the need of special training for those who are to follow commercial life. The *Consular Reports* show that an intimate knowledge of the conditions to be met in foreign markets is of great importance. The Philadelphia Museum is designed to supply this information. It is very apparent how a failure to observe explicit directions of importers, as to dimensions and methods of packing or to consider the customs of possible consumers, stand in the way of the sale of otherwise excellent goods. In China, a fanciful Chinese dragon, as a trade-mark, will sell goods better than if the house-mark were used. In Nicaragua the machetes used by the natives are those made in Hartford, Conn., because Collins produced a blade of exactly the shape the natives desired.

MUNYON AND HIS REMEDIES.—An exceedingly well written and timely article on Munyon and his remedies appears in the *Amer. Drug. and Pharm. Record*, 1900, p. 75. It is just such an article as every pharmacist ought to see and every daily newspaper in the country publish. If some philanthropist or public-spirited citizen would only look into the work of such men as Munyon, we cannot but believe that the race would be benefited thereby. The article in question brings out in an interesting manner the falsity of much of the so-called philanthropy as practised.

CALIFORNIA FIG CULTURE.—It was W. T. Swingle who first showed that the absence of the blastophaga or caprifigs in California was the cause of the failure of fig culture in California. The caprifig is the home of a winged insect which, when it exists, is covered with pollen. On entering a new fig flower to deposit her eggs, the pollen is brought in contact with the pistils of the flowers in the fig. There are about seventy-five known varieties of caprifig, and it is a question as to whether different varieties of the caprifig would impart to the edible fig different flavors, etc. It is said that no horticultural industry would be more profitable in California than fig raising if it could be made a success.—*Scientific Amer.*, 1899, p. 410.

NOTES AND NEWS.

THE UNIVERSITY OF WISCONSIN.—The School of Pharmacy offers this summer, beginning July 2d, a course of instruction which is adapted "to the limited circumstances and time of the student, enabling him to embrace only the essentials of study."

THE UNIVERSITY OF MICHIGAN.—A course of studies in pharmacology, bacteriology and physiological chemistry is being organized at the University of Michigan, to take the time of one college year, in adaptation to the needs of graduates in pharmacy who are to make a specialty of biological work. Such work has to be done in the pharmaceutical manufacturing houses, and wherever physiological valuations are necessary.

FRANK G. RYAN, formerly Instructor in Pharmacy and Assistant Director in the Pharmaceutical Laboratory of the Philadelphia College of Pharmacy, has accepted a position as head pharmacist of the manufacturing department of Parke, Davis & Co. In order to fill the vacancies thus created, C. H. La Wall, a well-known contributor to this JOURNAL, was elected Instructor in Pharmacy and E. F. Cook Assistant in the Pharmaceutical Laboratory.

H. H. RUSBY, the honorary curator of the economic collections of the New York Botanical Garden, has displayed his usual energy in securing complete local collections of economical material as well as extensive donations from various individuals and firms for that institution.

CHARLES F. CHANDLER has been elected President of the College of Pharmacy of the city of New York.

W. B. SAUNDERS, of Philadelphia, has recently associated with himself in business, under the firm name of W. B. Saunders & Co., Mr. F. L. Hopkins, manager of the subscription department, and Mr. T. F. Dagney, manager of the publication department. These gentlemen have been connected with the establishment almost from its inception, and to their capable management of their respective departments Mr. Saunders attributes much of the success that has attended his efforts.

CARBOLIC ACID AND WAR.—The demand for carbolic acid for explosives has increased rapidly in Germany in the past ten years. In earlier years carbolic acid was used largely in the manufacture of dyes. It is now largely used also in the manufacture of lyddite of South African notoriety.—*Am. Gas Light Jour.*, 1900, p. 694.

CANDY FOR THE SOLDIERS.—Fifty tons of candy have been sent to the soldiers in the Philippine Islands by the Commissary Department of the army during the last three months, and large amounts to the soldiers in Cuba and Puerto Rico. This is done upon the advice of the medical as well as line officers of the army, because it is a physiological fact that in the tropics a moderate consumption of confectionery promotes health and satisfies a natural and not unhealthful craving of the stomach.—*Med. News*, 1900, p. 427.

POLLEN GRAINS AND CATARRHAL TROUBLES.—M. Hilliger (*Illus. Gart. Zeit.*) examined the expectorated products of the members of a family that were each year afflicted with an irritant cough and other catarrhal symptoms,

and found the irritant material which excited the cough came from the pollen of plane trees. The editor of the *Nat. Drug.* (1900, p. 80) records finding in discharges from the nostrils and eyes of a patient suffering with hay fever the efflorescence of "box tree." Galen and Dioscorides also mention the irritating effects of pollen of plane tree.

BORIC ACID AND FORMALIN, when used as preservatives of milk (and probably of other foods), are very injurious to the health of the consumer and particularly so to the health of young infants.—H. E. Annett, in *The Lancet*, November 11, 1899; *Therap. Gaz.*, 1900, p. 251.

NEW MICROCHEMICAL REACTION OF PALLADIUM.—If a solution of palladium chloride and potassium nitrite are mixed, and immediately afterwards excess of a caustic alkali is added, beautiful rhombohedral yellowish crystals are formed, being a double nitrite of palladium and potassium.—Pozzi-Escot and Congnet, in *Compt. rend.*, April 17, 1900; *Chem. News*, 1900, p. 240.

HOW PATENT MEDICINE BUSINESS IS WORKED.—"These manufacturers of patent medicine, nine out of ten, live solely by the newspapers, and sometimes are admirably managed. I know some establishments in which a regular staff is employed; I know something about them, because they try to bribe me to certify to the value of their concoctions. So I say there is a regular staff. There is the literary man who writes the letters giving marvellous accounts of marvellous cases. There is the artist who shows the patient before and after taking twenty-two bottles of the medicine; there is the poet, who composes poems upon the subject; there is the liar, who swears to what he knows is not true, and the forger, who produces testimonials from his own imagination. Without exaggeration, I should say that nine out of ten of these patent medicines are frauds, pure and simple; the real business is advertising for dupes. The medical part of it is a side issue. I am pretty sure, if I were to pound up brick bats and spend \$100,000 in offering it at \$1 an ounce, as a sure cure for some diseases that cannot be cured, I should get at least \$110,000, thus giving me \$10,000 for my trouble. Nine-tenths of the medicines sent out in this fashion have no more curative properties than brick-bat dust.—Charles F. Chandler, in *Medical Record*."—*The Retail Druggist*, January, 1900.

ADULTERATED FOODS.—"We see in *The New York Commonwealth* that U. S. Senator Mason, of the Senate Committee, which has been gathering evidence in regard to our adulterated foods, says that the United States is the only country that does not protect the consumers of food products and that the amount of adulteration carried on in this country is simply appalling.

"It seems to us that in many of our larger towns good women might do a profitable business in preparing for sale jellies, jams and other food products in regard to the purity and healthfulness of which there could be no doubt."—*Our Dumb Animals*, 1900, p. 126.

LOSSES TO FRENCH SCIENCE.—The number of deaths of noted French scientists during the past few months has been unusual. The Paris School of Pharmacy has lost two of its faculty: Professors Beauregard and Planchon. The latter was one of the foremost workers in pharmacy, and was the President of the coming International Pharmaceutical Congress.

NOTES AND NEWS.

H. C. WOOD, President of the U.S.P. Convention for 1900, is now in Japan and not expected back till about the time the year's work begins at the University of Pennsylvania.

S. P. SADTLER is revising his "Handbook of Industrial Organic Chemistry," a new edition of which is expected some time in September.

JOSEPH P. REMINGTON is expected shortly to attend the International Pharmaceutical Congress in Paris.

CHARLES F. CHANDLER has received the degree of D.Sc. *honoris causa* from the University at Oxford.

HENRY H. RUSBY has written the *Materia Medica* for Buck's Reference Handbook of the Medical Sciences.

W. O. RICHTMANN, of the University of Wisconsin, while on a recent visit in Eastern cities, informed us that R. H. Denniston, of the same University, was endeavoring to do a similar work at that University as J. O. Schlotterbeck, at the University of Michigan (see this JOURNAL, 1900, p. 203), in utilizing the grounds for the purpose of growing medicinal and other economical plants for class or research work.

W. L. SCOVILLE is contributing an interesting series of articles to the *Bulletin of Pharmacy* on "Pharmaceutical Testing."

RODNEY H. TRUE has been appointed Lecturer on Plant Physiology at Harvard University.

HARRY B. MASON, of Detroit, Mich., has a valuable article on "The Urgent Need of Pure Food Reform," in the June number of *The Outlook*.

MISS MAE THOMPSON HARDERS, P.C.P., '93, has been appointed Demonstrator in Pharmacy at the Woman's Medical College, of Philadelphia, to succeed F. G. Ryan, resigned.

J. E. MORRISON, an ex-President of the American Pharmaceutical Association, succeeds the late T. D. Reid as Professor of Pharmacy and *Materia Medica* at the Montreal College of Pharmacy.

H. BECKURTS, one of the editors of the *Apotheker Zeitung*, has been appointed Rector of the Technische Hochschule of Braunschweig.

THE PHARMACOPŒIA CONVENTION was incorporated on July 11, 1900. The incorporators are Wm. S. Thompson, George L. Magruder, John T. Winter, Thomas C. Smith, F. M. Criswell, Murray Gott Motter and Wm. L. Mew. The period of incorporation is 999 years. The affairs, funds and property are vested in the Board of Trustees.

THE GRADUATE, the class annual of the Philadelphia College of Pharmacy, edited and published by the Class of 1900, has just been issued.

THE PROCEEDINGS OF THE MISSOURI PHARMACEUTICAL ASSOCIATION of the meeting held June 12-15, 1900, are published and distributed one month after the meeting.

LIBRARIES FOR EMPLOYEES.—One of the most commendable features of the movement looking to the benefit of employees is that inaugurated by a number of large firms in encouraging and providing means for the education of their employees. It is of interest to note in this connection that the employees of Parke, Davis & Co., at Detroit, have an organization known as the "Laboratory Reading Association," which manages its own affairs, an apartment having been reserved for the use of the Association by the firm.

GEORGIA STATE BOARD OF PHARMACY.—On the 17th of July the Governor appointed C. D. Jordan, of Monticello, and J. G. Dodson, of Americus, to fill the vacancies on the Board of Pharmacy occasioned by the retirement of John P. Turner and the resignation of Harry Sharp, respectively.

FOR THE VOMITING OF PREGNANCY.—Dr. Dudley (*American Journal of Obstetrics*, February; *Northwestern Lancet*, June 15th) speaks very highly of capsules containing cocaine, half a grain; camphor monobromide, 3 grains, the latter drug being added to offset the bad effects of cocaine.—*N. Y. Med. Jour.*, 1900, p. 17.

A NEW DRASTIC CATHARTIC.—*Ἰατρικὴ Πρόοδος* for April ascribes the following to Bonatti:

R	Senna leaves	180 grains.
	Infuse in boiling water	4,500 "
Add:		
	Chlorine water	from 22½ to 45 "
	Simple syrup	450 "

M.—This preparation exercises drastic results where even jalap and croton oil have failed.—*N. Y. Med. Jour.*, 1900, p. 113.

THE SECRETARY OF THE MICHIGAN BOARD OF PHARMACY is issuing to the druggists of the State a circular of inquiry as to the advisability of requiring applicants for State examinations in pharmacy to be graduates, such legal provision not to go into effect until two years after its enactment and publication.

ST. LOUIS COLLEGE OF PHARMACY.—At the annual meeting of the St. Louis College of Pharmacy the following officers were elected for the ensuing year: President, Hy. T. Rohlfing; Vice-President, Theo. F. Hageman; Treasurer, Sol. Boehm; Recording Secretary, Wm. C. Bolen; Corresponding Secretary, J. C. Falk. Trustees to serve two years: E. P. Walsh, Thos. Layton and H. F. A. Spilker. Trustees holding over are: Charles Gietner, H. W. Scheffer and Louis Schurk. Charles Gietner was elected Chairman of the Board of Trustees.

THE LIMITS OF THE SPECIALIST.—John B. Deaver, of Philadelphia, in an article on the "Limitation of Operative Gynecology," in the *Am. Med. Quarterly*, 1900, p. 333, says of the specialist: "A fact that we well know is the tendency of all specialism to confine itself to its own narrow limit and to lose sight of the larger field and the possibilities of intercurrent and interdependent affections of the human organism. In other words, the specialist is apt to lose sight of generalities and substitute therefor his own narrow range of vision."

NOTES AND NEWS.

INTERNATIONAL PHARMACEUTICAL CONGRESS.—There have been nine meetings of the International Pharmaceutical Congress. They have been held, according to the *Chem. and Drug.*, 1900, p. 268, as follows: Brunswick (1865); Paris (1867); Vienna (1869); St. Petersburg (1874); London (1881); Brussels (1885); Chicago (1893); Brussels (1898); Paris (1900).

MERCHANTS' AND MANUFACTURERS' EXPOSITION.—There will be held a Merchants' and Manufacturers' Exposition at the Mechanics' Building, Boston, from October 1st to 27th of the present year—1900—which will be the first triennial show given under the auspices of the Merchants' and Manufacturers' Exhibition Association (incorporated).

INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.—It was decided at an international conference held in London in June, 1900, to publish, beginning with the year 1901, an International Catalogue of Scientific Literature, which is to be issued only in the form of annual volumes at first. The catalogue is to include both an author and a subject index. It will comprise the following subjects: Mathematics, mechanics, physics, chemistry, astronomy, meteorology (including terrestrial magnetism), mineralogy (including petrology and crystallography), geology, geography (mathematical and physical), paleontology, general biology, botany, zoology, human anatomy, physical anthropology, physiology (including experimental psychology, pharmacology and experimental pathology) and bacteriology; in all seventeen subjects. At least one volume will be given to each subject, and it is proposed that not all the volumes shall be issued at once, but in four groups, as soon as possible after the first of January, April, July and October, respectively. The subscription price for a complete set of the whole catalogue in seventeen volumes is £17, say \$85.

The Smithsonian Institution has provisionally undertaken to represent the interests of the catalogue in the United States, and will receive promises of subscriptions.

THE WELLCOME CHEMICAL RESEARCH LABORATORIES, now located at 6 King Street, Snow Hill, London, E.C., were established in 1896, and recently a pamphlet descriptive of their origin and province has been issued. The plan for these laboratories originated with Mr. Henry S. Wellcome, of the firm of Burroughs, Wellcome & Co., and, as stated in the pamphlet, they "are designed for investigations in both pure and applied chemistry, and, in the latter instance, to the study of that large class of both organic and inorganic compounds which are employed as medicinal agents in the treatment of disease." Dr. Frederick B. Power, well known for his chemical research work, is the director, and, from time to time, publications embodying the results of original work will be distributed, several communications having already appeared.

THE NATIONAL FORMULARY.—In order to acquaint the medical profession more thoroughly with the many desirable and valuable preparations to be found in the National Formulary, a complete epitome of the formulas has been prepared under the direction of the Council of the American Pharma-

ceutical Association, in convenient form, and giving medicinal properties, uses and adult doses of all the preparations. The chief aim of the National Formulary, now in its fourteenth year, is to insure uniformity of strength, appearance and taste in numerous preparations frequently designated by physicians to be of special manufacture, whereby the pharmacist is subjected to great inconvenience and expense.

The better known the preparations of the National Formulary become to physicians, the more likely are they to be designated, and pharmacists everywhere must realize the great advantages that would accrue to them if this could be achieved. It is, therefore, urged that pharmacists will find it to their interest to supply physicians with copies of the epitome, a convenient booklet of about ninety-six pages for pocket carriage and in semi-flexible linen cover.

The epitome of the National Formulary can be had in lots to suit at the following prices: Less than 25 copies, 15 cents apiece; 25 to 100 copies, 10 cents apiece.

If more than 100 copies are ordered, a discount of 5 per cent. will be allowed on each additional 100 up to 500; on orders for more than 500 copies, a discount of 10 per cent. will be allowed on each additional 100; on orders for 1,000 copies or more a discount of 10 per cent. will be allowed on the whole amount.

If desired, an imprint can be put on outside of front cover, at an additional cost of \$2.50 per 1,000 copies or any less number. All orders should be addressed to Chas. Caspari, Jr., General Secretary of the American Pharmaceutical Association, Baltimore, Md.

A COMPLETE BRANCH HOUSE OF MERCK & CO. has been established in Chicago at 227 Randolph Street, and they request that all correspondence and business not purely financial or scientific be addressed to them there from points more convenient to Chicago than to New York.

ARTIFICIAL AIR.—It is stated (*New York Herald*) that Desgrez and Balthazard have constructed a diver's helmet of aluminum, in which there is a lining of sodium dioxide. The properties of this chemical will keep the air so saturated with oxygen, and at the same time will absorb so much of the carbon dioxide, that the danger point heretofore existing will be removed and enable the wearer of the helmet to move and work for hours in otherwise unbearable surroundings.

The importance of the discovery can hardly be overestimated, as there are many conditions under which men labor, as in caissons, coal mines, submarine boats, factories, etc., where the air conditions are very bad, and anything to restore the qualities of the air will be indeed valuable.

HENRY V. ARNY has returned to Cleveland, and will continue his work as Professor of Pharmacy and Director of the Pharmaceutical Laboratory of the Cleveland School of Pharmacy.

VERMONT PHARMACEUTICAL ASSOCIATION.—The next annual meeting of this Association will occur at Rutland, Wednesday and Thursday, September 26th and 27th.

NOTES AND NEWS.

SCIENTIFIC RESEARCH.—In accordance with the recommendation of Dr. W. W. Keen in his recent presidential address, the Trustees of the American Medical Association have established a fund of \$500 to be expended annually for the encouragement of scientific research, no sum to be given to any one individual to exceed \$100 at one time. This is a step in the right direction, as it gives the younger men of the profession an opportunity to investigate subjects of scientific interest with some small compensation should they be successful.

THE NOBEL PRIZES.—We are accustomed to complain bitterly that the real-est and greatest contributors to human happiness and progress receive a dismally small share of the material rewards that the earth has to offer. This favorite grievance of the world is considerably less of a grievance by the action of a single man, the Swede, Alfred Nobel, who left an enormous fortune for the reward of just such achievements.

The Nobel endowment is based on the will of Dr. Alfred Nobel, which was drawn up in 1895. Shortly afterward Dr. Nobel died, leaving an estate said to be worth \$10,000,000. He ordered, after various bequests, that the residue of his fortune should constitute a fund the interest of which should be distributed annually to those who in the preceding year should have rendered the greatest services to humanity. The sum total shall be divided into five equal portions, assigned as follows :

To the person having made the most important discovery or invention in the department of physical science.

To the person having made the most important discovery or having produced the greatest improvement in chemistry.

To the author of the most important discovery in the department of physiology or of medicine.

To the author having produced the most notable literary work in the sense of idealism.

To the person having done the most, or the best, in the work of establishing the brotherhood of nations, for the suppression or the reduction of standing armies, as well as for the formation and the propagation of peace conferences.

The prizes will be awarded as follows : For physical science and chemistry, by the Swedish Academy of Sciences ; for works in physiology or medicine, by the Carolin Institute of Stockholm ; for literature, by the Academy of Stockholm ; finally, for the work of peace, by a committee of five members, elected by the Norwegian Storting. Nationality shall not be considered, so that the prize may accrue to the most worthy, whether he be a Scandinavian or not.

It is expected that a monetary value of at least \$100,000 will be reached for each prize, which is a sufficient explanation of the interest shown in those circles which will furnish the competitors.

The Legation of Sweden and Norway, at Washington, has recently made public for the first time the conditions surrounding the award. The three corporations awarding the Nobel prizes are the Royal Academy of Sciences at Stockholm, founded in 1739 ; the Swedish Academy at Stockholm, founded in 1786, of both of which the King is the protector, and the Carolin Institute of Medicine and Surgery, of Stockholm.

C. F. SHOEMAKER, Philadelphia, has been elected Chairman of the Proprietary Committee of the National Wholesale Druggists' Association, to succeed Frank A. Faxou.

THE PARIS EXPOSITION OF 1900 has announced that the highest award (the Grand Prize) was bestowed upon Remington's Practice of Pharmacy. The work was exhibited by the publishers, J. B. Lippincott Company, of Philadelphia. American pharmacy is to be congratulated on account of the international recognition of American pharmaceutical literature.

AN OLD HISTORIC SITE on East Washington Square has passed from the ownership of the heirs of the famous lawyer, Horace Binney, and will soon be torn down to make way for a fine building to be occupied by J. B. Lippincott Company, whose old home was burned down some time ago. The site is considered a very eligible one for the Lippincott Company, as it has light on three sides, is very central, and they will be enabled to promptly issue and increase their excellent line of medical publications by standard authorities. The new catalogue of the J. B. Lippincott Company, just issued, is handsomely illustrated with excellent portraits of many of America's leading medical writers.

STATISTICAL METHODS with special reference to biological variation is a new book by Prof. C. B. Davenport, of the University of Chicago, and is published by John Wiley & Sons. This work is intended especially for botanists, zoologists, anthropologists, anatomists, physiologists and psychologists who are interested in *the quantitative study of species and of organic variation*. It will also be of service to economists, sociologists, meteorologists and practical statisticians. It treats in simple language and, for the most part, without the use of mathematics beyond the elements of algebra of the statistical methods elaborated by Galton and Pearson.

The work is a complete handbook, for it contains tables of reduction from English to metric units; squares, cubes, roots and reciprocals of numbers from 1 to 1,000; six-place logarithms of numbers and circular functions; table of gamma functions, etc. The method of using each table is fully explained. There have been added, also, some pages of metric cross-section paper and a protractor. The book contains twenty-eight figures, is of pocket size, and is bound in morocco.

THERAPEUTIC REFERENCE BOOK.—Warner's new reference book, just issued, contains many new features, new formulæ and much valuable up-to-date information. The physician and pharmacist will find the work useful. It may be obtained of Wm. R. Warner & Co., Philadelphia, Chicago and New York.

HOMŒOPATHY has been defined at the recent meeting of the American Institute of Homœopathy as follows: "A homœopathic physician is one who adds to his general knowledge of medicine a special knowledge of homœopathic therapeutics and observes the law of similia. All that pertains to medicine is his by tradition, by inheritance and by right."

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