more smooth than the *perfect fourth* or the *perfect fifth.*

It is believed that these results are of significance, in connection with a number of problems in the field of musical esthetics.

The experiment described above has stimulated similar tests in other institutions. In Wellesley College, under the direction of Professor H. C. Macdougall, experiments were made by Miss Hetty S. Wheeler, in classes yielding 204 replies. Owing to a typographical error, 306 replies were received in the case of the *major sixth,* and only 102 in the case of the *perfect fifth.* The results from Wellesley College, which are very similar to those described above, are contained in the following table:

	Smooth	Harsh
Minor second	0	204
Major second	14	190
Minor third	199	5
Major third	204	0
Perfect fourth	139	65
Augmented fourth	166	38
Perfect fifth	72	30
Minor sixth	202	2
Major sixth	289	17
Minor seventh	14	190
Major seventh	0	204

Professor W. A. White, of Syracuse University, also, made a similar experiment, with somewhat different results. Inasmuch, however, as his tests were made on classes of students more or less advanced in the study of harmony, many of whom recognized the intervals as they were played, the experiment is obviously not comparable with those previously mentioned.

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THE FORTIETH GENERAL MEETING OF THE AMERICAN CHEMICAL SOCIETY. II

SECTION OF PHARMACEUTICAL CHEMISTRY

A. B. Stevens, chairman

A New Form of Separator: C. E. PARKER.

The "shaking out" method of extraction is difficult or impracticable with solutions which have marked tendency to emulsify. A separator of flat form is described, in which, when in a horizontal position, the immiscible liquids spread out in broad thin layers in contact with each other. By gently tilting the separator by manual or mechanical means the layers float about without mixing and the extraction of soluble material is readily effected. The operation may be called "floating out" instead of "shaking out." On placing the separator in erect position the lower liquid may be drawn off through a stopcock as usual.

Investigations of Glacial Phosphoric Acid: L. F. KEBLER and B. HERSTEIN.

It has been known for many years that the composition of glacial phosphoric acid is far from uniform, and its use so far as a chemical reagent and for the manufacture of medicinal products is of questionable utility. Furthermore, solutions of glacial phosphoric acid are comparatively unstable, the metaphosphoric acid reverting to the pyro and the pyro gradually to the ortho. The object of this contribution is: (1) to give a method for determining the respective amounts of the various hydrates of phosphorus pentoxid present in ordinary glacial phosphoric acid; (2) to determine the rapidity of reversion to the higher forms of hydration; (3) to show the undesirability of using it either as a reagent or for preparing medicines.

The Purity of Glycerin: H. C. FULLER and L. F. KEBLER.

In this paper is discussed results of investigations of the various brands of glycerin furnished by manufacturers knowing the object and purpose of such samples. The chief objects of the examinations were: (1) To determine whether or not the tests prescribed by the Pharmacopœia were unduly rigid. (2) Whether or not any glycerin was available which when used in making up Haines's solution would not be instrumental in causing a reduction of the copper.

Note on the Determination of Morphin: C. E. PARKER.

The use of a solution of thymol in chloroform (or other volatile solvent) for extracting morphin from solutions, especially those containing glycerol and small amounts of morphin, is described. Opium preparations are first freed from alcohol and then extracted with chloroform, first in acid or neutral solution and again after addition of excess of potassium hydroxid. The solution is then acidified, excess of sodium bicarbonate added and extracted with the thymol solution. The thymol solution is shaken out with one per cent. hydrochloric acid and the latter evaporated. The

morphin in the residue is determined as silicotungstate according to the method of Bertrand.

Notes on Two Important Alkaloidal Reactions: H. C. Fuller.

This paper discusses the value of the Vitali reaction and the bichromate sulphuric acid reaction in connection with the identification of small amounts of alkaloids in the forensic analysis of medicinal products.

Experiments were conducted with the residues left by extracting the alkaline solutions of various drugs with petroleum, ether and chloroform. It was shown that alkaloids extracted from belladonna, coca, colchicum, nux vomica and yohimbo gave the Vitali reaction with nitric acid and alcoholic potash. The purple color with bichromate and sulphuric acid was given to a greater or less extent by alkaloids extracted from gelsemium, hydrastis, nux vomica, opium, sanguinaria and yohimbe.

Directions are given for the separation and identification of the alkaloids in a mixture of coca, belladonna and nux vomica, and for distinguishing between strychnin and yohimbin when in small quantities. The difference in reactions between strychnin and the alkaloids of hydrastis, gelsemium, sanguinaria and opium is noted, and emphasis laid on the similarity of the reactions of a mixture of nux vomica and gelsemium to a mixture of belladonna and nux vomica.

The Estimation of Molybdenum Trioxid: B. Herstein.

Various methods for the purpose of determining the degree of purity of chemical reagents containing molybdenum have been given, but these varying methods are not only cumbersome, but unsatisfactory, as to final results. This paper contains a method for precipitating molybdenum from a strongly acid solution by means of thioacetic acid, and converting the purified precipitate by means of ignition to molybdic trioxid in a Gooch crucible. Other sulphur-bearing agents were also employed to precipitate the molybdenum with unsatisfactory results.

Tincture of Iodine: Azor Thurston.

An outline of methods for determining iodine, ethyl and hydrogen iodides, potassium iodide and alcohol.

Chemical Manipulations and the Variation of Results: W. A. Pearson.

The results of a chemical analysis are dependent upon three principal factors: (1) method employed, (2) technic of chemist, (3) accidental errors. The variation of results due to making reports for a moisture-free sample and a sample as received is discussed, and a recommendation made that results, in some way, should indicate the active principles in the drug as received.

The variation of results obtained in the standardization of deci-normal sulphuric acid is mentioned and the comparative accuracy of two methods shown.

The comparative accuracy of short methods and the widely separated views the public has of the chemist's ability, are mentioned.

The Need of Methods of Analysis of Pharmacopœial Articles: B. L. Murray.

In many instances the U. S. Pharmacopœia requires a high degree of purity without giving any quantitative methods of determining the purity. It is suggested that the American Chemical Society, through its Section of Pharmaceutical Chemistry, endeavor to find suitable methods of analysis, where they are now wanting in the Pharmacopœia.

Chemical and Physiological Assay of Aconite: A. B. Stevens.

Numerous experiments prove that aconite contains, in addition to aconitine, a non-active basic constituent which is much less soluble in ether than in chloroform. Consequently the latter should not be used in the assay of aconite or its preparations. The best method for the assay of aconite is believed to be the present pharmacopœial method, or better, the writer's original method in which the alcoholic extract was evaporated with powdered pumice stone.

Aconite root, under various conditions of age and preservation, were assayed by the method above and compared with the physiological method. The same methods were applied to galenical preparations in their normal condition, as well as to those which had been subjected to experiments with a view to partially decomposing the alkaloid. The results prove that the chemical method can be relied upon to determine the quality of aconite and its official preparations. Individuals are not alike sensitive to the action of aconite, hence the physiological method can not be relied upon for standardization.

The following papers were reported by title:

The Assay of Medicated Plasters: F. B. Kilmer.
Pharmacopœial Ash Standards: Edward Kremers.
Note on the Curing of Burdock Root: Edward Kremers.

B. E. Curry,
Press Secretary

(*To be continued*)