PHARMACEUTICAL ABSTRACTS

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CONTENTS

CHEMISTRY

ANALYTICAL (*Continued*)

Acetylsalicylic Acid, Benzoic Acid and Salicylic Acid. The crystals formed on treatment of acetylsalicylic acid, salicylic acid (I), and benzoic acid (II) in 2% triethanolamine with silver nitrate are described; as are also those formed on treating dry I and II with lead triethanolamine, and dry I with bromide-bromate solution, and dry II with zinc pyridine. The tests were adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 93; through *Squibb Abstr. Bull.*, 11 (1938), A-477. (F. J. S.)

Adrenaline—Estimation of. A colorimetric method is described by which 0.04μg. of epinephrine may be estimated with a standard error of about 0.015μg. The method depends on the fact that epinephrine reduces arsenomolybdic acid with the formation of a blue color. In order to determine epinephrine in tissue extracts it is best absorbed on a specially prepared aluminum hydroxide, which is afterward dissolved in the reagents of the test so that the epinephrine is recovered completely. The optimum p_H for the absorption of epinephrine is between 8.0 and 8.5. On the acid side of p_H 7.0 no absorption takes place. For the determination the fraction absorbed at p_H 8.5 is heated with alkali and mixed with the arsenomolybdenic reagent. In addition a very specific qualitative test is described which depends on the effect of alkali. By this method epinephrine can be estimated in tissues provided that the concentration exceeds 10^{-7}. If the concentration is lower than this the results must be interpreted with caution.—FRANK H. SHAW. *Biochem. J.*, 32 (1938), 19; through *Squibb Abstr. Bull.*, 11 (1938), A-434. (F. J. S.)

Alcohol—Investigation of Small Quantities of Isopropanol in. The method used consists in the oxidation of the isopropanol by means of saturated bromine water and the colorimetric determination of the acetone formed with sodium nitroprusside. Samples of alcohol from beets, molasses, and brandy of wine, marc and fruits were tested and all found to contain isopropanol.—MAURICE METRA, LUCIEN LESAGE and FERNAND DESCATOIRE. *Compt. rend.*, 206 (1938), 1026. (G. W. H.)

Allyl Derivatives—Bromometric Determination of. Approximately enough samples (0.05 to 0.16 Gm.) to require 10 to 15 cc. of decinormal potassium bromate solution is dissolved in 5 to 6 cc. of 8 to 10% sodium hydroxide and refluxed for 20 minutes; 25 cc. of 20% hydrochloric acid is added to the cooled solution, it is again cooled, 0.5 Gm. of potassium bromide is added, and the solution is titrated with decinormal potassium bromate to a light yellowish color; then 120 to 150 cc. of water and a crystal of potassium iodide and starch indicator are added, and the solution is titrated with decinormal thiosulfate.—FLORA WESSEL and MARTA KESZLER. *Magyar Gyógyszerésztud. Társaság Értesitője*, 13 (1937), 161–164; through *Chimie & Industrie*, 38 (1937), 735. (A. P.-C.)

***p*-Aminobenzenesulfonamide and Its Determination.** Take 30 to 80 mg. of sample in a 500-cc., glass-stoppered brominating flask, dissolve in a little hydrochloric acid and make neutral with sodium hydroxide. Dilure to 50 cc., add a measured volume of decinormal potassium bromate so as to have about 10 to 30% in excess. Dissolve 1 Gm. of potassium bromide in the mixture and add rapidly 10 cc. of concentrated hydrochloric acid. Close the flask and after allowing the mixture to react for 5 minutes in the dark, add a solution of 1 Gm. of potassium iodide in 10 cc. of water. Shake well and dilute to 350 cc. Titrate the liberated iodine with decinormal sodium thiosulfate. One cubic centimeter decinormal potassium bromate = 4.304 mg. of aminobenzene sulfonamide. The direct titration with decinormal potassium bromate can be carried out in 5 to 10% sulfuric acid, but the results are always low. The analysis, however, can be accomplished on the basis of the hydrolysis of the aminosulfonic acid group. To accomplish this, the sample is refluxed for an hour in the presence of dilute sulfuric acid, the solution is made basic to methyl red by adding pure sodium hydroxide and the liberated ammonia is distilled into a measured volume of hydrochloric acid solution. The excess acid is titrated with decinormal sodium hydroxide to a methyl red end-point.—E. SCHULEK and I. BOLDIZSAR. *Z. anal. Chem.*, 108 (1937), 369–400; through *Chimie & Industrie*, 38 (1937), 1136. (A. P.-C.)

Anabasine Sulfate and Nicotine Sulfate—Reaction for Distinguishing. Anabasine sulfate and nicotine sulfate have many reactions in common, Sokolov (*Khim. Farm.*, 3 (1935), 162), has shown that hydrofluosilicic acid is an excellent reagent for precipitating anabasine fluosilicate in presence of nicotine, and it is now shown that if an ethereal solution of nicotine is mixed with

an equal volume of ethereal iodine solution a precipitate of $C_{10}H_{14}N_2I_2.HI$ is formed whereas anabasine does not give a similar precipitate.—S. A. KATZ. *Z. anal. Chem.*, 108 (1937), 408; through *Chimie & Industrie*, 38 (1937), 996. (A. P.-C.)

Apomorphine, Benzylmorphine (Peronine), Ethylmorphine (Dionine) and Hydrastinine. Micro tests are described for the detection of certain alkaloids by the crystals formed with suitable reagents. Apomorphine forms characteristic crystals with gold chloride and with hydrochloric acid; hydrastinine with potassium permanganate, mercurous chloride and HCl-$K_4Fe(CN)_6$; ethyl morphine-HCl (Dionine) with Wagner's reagent (iodine and potassium iodide) and mercurous chloride; and benzyl morphine-HCl (Peronine) with potassium iodide, ammonium thiocyanate and hydrochloric acid. The tests were adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 91; through *Squibb Abstr. Bull.*, 11 (1938), A-477. (F. J. S.)

Arsenic—Electrical Deposition and Determination of. Arsenic in solution as arsenous acid can be quantitatively deposited from a hydrochloric acid solution along with copper, if the quantity of arsenic present is less than 0.05 Gm. Pentavalent arsenic must first be chemically reduced to the trivalent state before electrical deposition is possible.—S. TORRANCE. *Analyst*, 63 (1938), 104. (G. L. W.)

Arsenic—Microchemical Detection of, in Forensic Work. Treat the minced organs with 20 parts of hydrogen peroxide and an equal volume of 30% sodium hydroxide solution; after 15 minutes the arsenic will be dissolved as arsenate. Place a drop of the solution on a microscope slide, add 1 drop of concentrated hydrochloric acid, mix, add 1 drop of concentrated sodium iodide solution, mix and finally add 1 drop of quinoline. On stirring, yellow-orange crystals of quinoline arsenate-iodide are obtained. Treat another drop of the solution with 1 drop of 20% cesium chloride solution, 1 drop of cold saturated disodium phosphate solution and some pyridine; colorless tetrahedrons are soon obtained if arsenic is present. In all cases positive tests were obtained very quickly when arsenic was known to be present.—A. MARTINI and B. BERISSO. *Ann. Farm. Bioquim. (Buenos-Aires)*, 7 (1936), 65–71; through *Chimie & Industrie*, 38 (1937), 666. (A. P.-C.)

Barium—Gravimetric Determination of, by Weighing Its Anhydrous Oxalate. The method proposed by the author for the determination of calcium as anhydrous oxalate (*An. Soc. Española Fis. Quim.*, 24 (1926), 465–494) is applied to the determination of barium. Precipitate a boiling neutral barium solution by a 0.098 molar ammonium oxalate solution, filter on a Gooch crucible, dry 1 hour at 250° C. in a current of air, and weigh. The results show an accuracy of ±0.2%, comparable with the chromate method and better than the permanganate method.—G. DIAZ VILLAMIL. *An. Soc. Española Fis. Quim.*, 34 (1936), 580–586; through *Chimie & Industrie*, 38 (1937), 662. (A. P.-C.)

Bismuth—Determination of, as *o*-Nitroquinolineiodobismuthate. To the solution to be analyzed, which should not contain more than 1 Gm. of bismuth in 30 cc. of solution, add successively about 3% of sulfuric acid, a 25% solution of *o*-nitroquinoline, 10 drops of 10% aqueous sulfurous acid solution, and finally with constant stirring 5 to 6 cc. of fifth-normal potassium iodide solution. Let stand for 30 minutes, filter through a porous porcelain crucible and wash repeatedly with a solution containing 50 cc. of twice normal sulfuric acid, 25 cc. of decinormal potassium iodide, 1.75 Gm. of *o*-nitroquinoline and 5 cc. of 10% sulfurous acid solution per liter; care should be taken to stir the precipitate with a glass rod. Dry to constant weight the precipitate which has a composition corresponding to the formula $C_9H_6N_2O_2.H.Bi_4$. For volumetric determination the precipitate is treated on the filter with a small quantity of 10% hydrochloric acid in which it slowly dissolves. In the hydrochloric acid solution the iodine can be titrated with decinormal potassium iodate in presence of acetone. Or, the iodine can be liberated with nitrous acid, and titrated with sodium thiosulfate in presence of carbon disulfide. Both the gravimetric and volumetric procedures are suitable for microdetermination.—G. CANNERI and D. BIGALLI. *Ann. chim. applicata*, 26 (1936), 455–460; through *Chimie & Industrie*, 39 (1938), 45. (A. P.-C.)

Bismuth Subiodides—Preparation and Properties of. The author's findings are summarized as follows: 1. Commercial samples of bismuth subiodide have been examined and the chemical and physical characters shown to be very varied. 2. Methods of preparation by digesting bismuth subnitrate with potassium iodide and by precipitation have been investigated. 3. The oily precipitated form has been prepared, approaching the composition BiOI. It has great

covering power, and clinical trial is advocated.—N. GLASS. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 357–363. (S. W. G.)

β-γ-Butylene Glycol, Acetylmethylcarbinol and Diacetyl—Determination of, in Wine and Other Fermentation Products. Diacetyl is determined almost quantitatively as nickel dimethylglyoxime by the Schmalfuss-Rethorn method. If separated from interfering substances by distillation a mean loss of 3% is unavoidable. Acetylmethylcarbinol (I) is oxidized with ferrous sulfate and ferric chloride to diacetyl and determined as such, yields of 96–97% being obtained. The loss during oxidation is, therefore, greater than 1%. β-γ-Butylene glycol (II) is determined by first oxidizing to I by heating at 70–80° for 20 minutes with a 10-fold excess of bromine, and subsequently to diacetyl as above, the final maximum yield being 93%. A procedure for the determination of II in wine is described.—L. C. E. KNIPHORST and C. C. KRUISHEER. *Z. Untersuch. Lebensm.*, 73 (1937), 1–19; through *J. Soc. Chem. Ind.*, 56 (1937), B., 486. (E. G. V.)

Calcium—Microdetermination of. The technic of the calcium determination is essentially that of Linder and Kirk, with the exception of the calcium oxalate, which is dissolved in about 1 cc. of 3.5% solution of perchloric acid and titrated with a 0.01*N* solution of hexanitrato ammonium cerate which is 1*N* with perchloric acid. Orthophenanthroline ferrous complex (0.0005*M*) or setopaline C (1% aqueous solution) is a satisfactory indicator, particularly the latter, since it uses up practically no cerate solution. When calcium is precipitated in the presence of proteins the calcium oxalate crystals are very small and, in spite of long digestion, losses of the precipitate through the filter stick are practically unavoidable. To overcome this difficulty, the precipitate was separated by centrifuging. The precipitation was carried out in pointed tubes of 1 to 2 cc. capacity. After standing for 1 hour or more the tubes were centrifuged, the supernatant liquid was drawn off by means of a long tipped medicine dropper, and the precipitate was washed once or twice with ammonium hydroxide solution (1 to 9) saturated with calcium oxalate. The washed precipitate was then dissolved as above, transfered to a 1- or 2-cc. beaker, and titrated. When the material is ashed as recommended by Linder and Kirk, either filtration or centrifugation may be used for the isolation of the precipitate of calcium oxalate.—G. H. ELLIS. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 112. (E. G. V.)

Calcium Silicate—Commercial Preparations of. Ten commercial specimens of calcium silicate supplied by six different firms, were examined as to composition. They varied widely. Some were free from sodium chloride, sodium carbonate and aluminium oxide, others contained various proportions of these chemicals. One specimen only contained calcium chloride. Some contained considerable amounts of sodium and calcium carbonates. A high carbonate content was considered undesirable, for the use of calcium silicate as an acid-binding agent in place of sodium or magnesium carbonate is based on the expectation that it will not free carbon dioxide in the stomach. It was feared that calcium silicate might take up carbon dioxide from the air during preparation or dispensing. In test, specimens were allowed to stand two years in a carbon dioxide-filled vessel, then re-analyzed. Most specimens showed a slight increase of carbonate content, but, taking into consideration the amount of atmospheric air necessary to supply much carbon dioxide during handling of the powder, the difficulty was not considered serious. The weight of a teaspoon of the various brands of the powder is cited. The p_H of a 1% aqueous suspension was determined for six brands.—T. S. THOMSEN. *Dansk Tids. Farm.*, 11 (1937), 357. (C. S. L.)

Calcium Sodium Lactate—Assay of. The procedure for determination of water may be varied so that 1 Gm. of sample is dried for 2 hours below 100° (to prevent caking) and subsequently at 130° to constant weight. The water may also be reported as 100—(per cent of calcium lactate + per cent of sodium lactate). The author suggests that the B. P. Codex procedure of titrating the residues, obtained in assaying for calcium and sodium, with *N*/10 sulfuric should be changed to allow dissolving the residues in excess *N*/1 or *N*/2 hydrochloric acid and back-titrating with standard alkali. A simpler method in the case of the calcium assay is to treat the residue with concentrated sulfuric acid and, after ignition, weigh as calcium sulfate. The application of uranyl acetate reagents to the determination of sodium in calcium sodium lactate is discussed.—S. G. LIVERSEDGE. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 364–368. (S. W. G.)

Camphor—Determination of, in Alcoholic Solution. Dinitrophenylhydrazine Method. Accurately measure 2 cc. of spirit of camphor into a 300-cc. Erlenmeyer flask containing 15 cc. of alcohol, and add 75 cc. of dinitrophenylhydrazine reagent solution. Connect the flask with a

reflux condenser, and heat the flask for about 4 hours by immersing it in actively boiling water. Allow the mixture to cool, add 200 cc. of distilled water, and set aside for 24 hours. Transfer the precipitate to a previously dried and weighed Gooch crucible, and wash with small portions of cold distilled water until the washings are no longer acid to litmus paper. Continue the suction until excess water is removed, dry the crucible and heat to constant weight at 100° C. The weight of the precipitate multiplied by 22.9 equals the weight of camphor. To correct the low results given by the method, add to the percentage of camphor found 0.2%. The dinitrophenylhydrazine reagent solution is prepared in the following manner: Dissolve 3.75 Gm. of 2,4-dinitrophenylhydrazine in a warm mixture of 45 cc. of concentrated sulfuric acid and 45 cc. of distilled water. Cool the solution, and add enough distilled water to make the solution measure 250 cc. If necessary filter the solution before using it.—E. M. PLEIN and C. F. POE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 78–80. (E. G. V.)

Cannabis—Report of League of Nations Sub-Committee on. *Detection.*—Mix 0.5 Gm. of powdered sample with 10 cc. of benzin for 1 minute, then filter through paper. To 1 cc. of filtrate add 3–4 drops of 5% alcoholic potassium hydroxide, mix for 1 minute, then add 1 cc. of amyl alcohol. If cannabis is present a rose- to red-violet appears. *Fluidextract or Tincture.*—Mix 1 cc. of sample with 10 cc. benzin, filter through cotton, add 100 mg. of animal charcoal to the filtrate and shake frequently during 5 minutes. Filter through paper, and continue as above. *Extract.*—Dissolve about 250 mg. of sample in 1 cc. of alcohol and continue as above.—F. DE-MYTTENAERE. *J. pharm. Belg.*, 19 (1937), 803–806. (S. W. G.)

Carbon Dioxide in Soaps and Other Detergents—Determination of. A simple, rapid and volumetric method for the determination of combined carbon dioxide in soaps, soap powders, "50% liquid sodium hydroxide," etc., is described. The gas liberated by acidification (hydrochloric acid) of the material within a closed, partly evacuated system, consisting of a reaction flask connected to an absorption flask (each supplied with a tap funnel for admission of reagents), is absorbed in a measured amount of an alkaline absorbing solution (equal volumes of N sodium hydroxide and N barium chloride), the excess of which is titrated with standard sodium bicarbonate.—L. B. HITCHCOCK and R. E. DIVINE. *Oil and Soap*, 15 (1938), 8–10; through *J. Soc. Chem. Ind.*, 57 (1938), 405. (E. G. V.)

Carbon Monoxide—Detection of, in Medicinal Oxygen. Reference is made to the method of U. S. P. XI and the Teague method. Report is made of experimental work which eliminates the use of iodine pentoxide. It depends upon the reduction of palladious chloride to palladium by carbon monoxide, the metallic palladium in suspension reacting with a solution of ammonium molybdate producing molybdenum blue, the intensity of which is proportional to the absolute amount of carbon monoxide in the sample tested. Principal difficulties of the iodine pentoxide method are eliminated but it is non-specific. Sensitivity is of the order of magnitude of 10 p. p. m.—FREDERICK K. BELL and JOHN C. KRANTZ. *J. Am. Pharm. Assoc.*, 27 (1938), 118. (Z. M. C.)

Carbonyl Compounds—Determination of. The determination is carried out as follows: Weigh out exactly 2 Gm. of mono-oxy-compound into a 100-cc. saponification flask, add 30 cc. (if the molecular weight of the oxy-compound is 100 or less, 40 ml. if more) of hydroxylamine hydrochloride in 90 cc. of hot water and adding ethyl alcohol (96%) to produce 1 liter. Allow the mixture to stand for 10 minutes. Then add 3 drops of a solution of bromophenol blue (obtained by dissolving 0.1 Gm. of bromophenol blue in 3 cc. of a 0.2% hot aqueous solution of potassium hydroxide and diluting to 250 cc.; the color of the solution must be dark red, but blue after diluting with more water) and titrate with N/2 solution of potassium hydroxide in ethyl alcohol until the yellow color changes to a greenish blue and this color is permanent. Percentage = $\frac{A.\ m.}{40}$ where A = number of cc. of $N/2$ potash absorbed and m = the molecular weight of the oxy-compound taken.—A. RECLAIRE and R. FRANK. *Perfumery Essent. Oil Rec.*, 29 (1938), 212. (A. C. DeD.)

Cascara Sagrada Extract—Constituents in. 3. Lipids and Glycosides. Polyhydroxyanthraquinones are characteristic of cascara bark and several other drug plants. They are present largely as glycosides and have been thought to be of major physiological importance, so a number of investigators have studied methods for determining anthraquinones. In the course of these studies a rhamnoside of emodin was obtained from cascara and there seems to be little evidence

that the anthraquinones account for the purgative action to any extent. The present study was a search for more information about the active principles. Experimental work on the drug is reported. Physiological studies were conducted with guinea pigs as test animals. Discussing the work, the authors state that feeding anthraquinones shows that the anthraquinones contribute to cathartic value but do not account for greater part of activity. Methyl hydrocotoin was found as a new ingredient and presence of isoemodin and rhamnosterol verified. Rhamnose and dextrose are present in about 1:1 in true glycosidic linkage. Dialysis proved best method of separating inert material from active ingredients in fluidextract. The lipid fraction was practically inert; isoemodin only slightly active; ethyl acetate and alcohol extracts, less active than standard fluidextract on either a total solids basis or on a basis of bark extracted. Bubbling air through the fluidextract for three hours at a boiling water-bath temperature reduced activity about 50%. The activity of the fluidextract was not changed much by complete hydrolysis of the glycosides or extraction of the free anthraquinones.—MELVIN W. GREEN, C. G. KING and GEORGE D. BEAL. *J. Am. Pharm. Assoc.*, 27 (1938), 95. (Z. M. C.)

Catalysts—Preparation and Use of. A neutral solution of cadmium sulfate and nickel sulfate or cobalt sulfate is treated with the theoretical amount of ammonium chromate and the washed precipitate converted into small pellets, which are heated in hydrogen at 325°, to produce a hydrogenation-dehydrogenation catalyst.—H. R. ARNOLD and W. A. LAZIER, assignors to E. I. DU PONT DE NEMOURS AND CO. U. S. pat. 2,047,945; through *J. Soc. Chem. Ind.*, 57 (1938), 53. (E. G. V.)

Chelidonium Majus—So-Called Resin from the Root of. It developed that the "resin" from the root of *Chelidonium majus* consists essentially of a fatty oil (40%) (the constituents of which were determined), together with ether-soluble acids (15%), and an ether-insoluble residue (mainly in alcoholic solution) and only resinous material 5%. Provisional experiments with white mice and grass frogs indicate that the constituents of Chelidonium resin possess no marked physiological activity.—H. NEUGEBAUER and K. BRUNNER. *Pharm. Zentralhalle*, 79 (1938), 17; through *Chem. Abstr.*, 32 (1938), 2688. (F. J. S.)

Chlorate Ion—Simplified Procedure for Determining the, by the Permanganate Method. In the determination of chlorates by boiling the solution with excess ferrous sulfate for 10 minutes and back-titrating with potassium permanganate (Treadwell), the boiling is unnecessary because the chlorate ion in the presence of free sulfuric acid is completely reduced by decinormal ferrous sulfate in 5 minutes and by half-normal ferrous sulfate in 1 minute at 20° C. Furthermore, acid solutions of ferrous sulfate do not change the titer at 20° C. for 2 hours and at the boiling temperature for 10 minutes. Hence the determinations can be effected in open vessels; this eliminates the use of flasks sealed with a Bunsen valve or working in an atmosphere of carbon dioxide. Treat a chlorate solution with decinormal ferrous sulfate or with half-normal ferrous sulfate containing 9 to 10 equivalents of sulfuric acid per liter (the total sulfate-ion concentration should not be less than 20%), and after 5 minutes or 1 minute, respectively, titrate with potassium permanganate. The method gives comparable results with the time reduction from 46 to 26 minutes.—S. S. SCHREIBMANN and A. V. BALEIEV. *Zav. Lab.*, 5 (1936), 425–427; through *Chimie & Industry*, 38 (1937), 658. (A. P.-C.)

Chlorides—A Conductivity-Volumetric Method for the Determination of, in Biological Fluids. The sample (0.05 to 1.0 cc.) is diluted with 50 cc. of distilled water. The conductivity of this solution is determined before and after the addition of successive known amounts of standard silver nitrate solution. The conductivity, plotted against the cc. of silver nitrate added, shows a sharp rise when the critical quantity is passed. The concentration is readily determined from the volume of standard silver nitrate corresponding to this point of inflection in the curve.—S. MIHAELOFF. *Bull. Soc. Chim. France*, 3 (1936), 2395–2403; through *Chimie & Industry*, 38 (1937), 1086. (A. P.-C.)

Chlorine—Losses of, in Different Materials with Various Ashing Temperatures. A quantitative study on the loss of chlorine incurred in ashing a number of organic substances at 500–800° C. and on the inhibition of such chlorine loss by the presence of excess sodium carbonate. No chlorine loss occurred at 600° with excess sodium carbonate.—T. A. PICKETT. *J. Assoc. Official Agr. Chem.*, 21 (1938), 107; through *Squibb Abstr. Bull.*, 11 (1938), A-433. (F. J. S.)

Chromatographic Adsorption—Application of. The author states that Tweff's method may be used successfully for: (1) Examination of a substance's chromatographic simplicity, which

corresponds to its state of purity (as a physical constant for the pure substance); (2) Identification of a substance; (3) The concentration of a substance at the expense of a very dilute solution (especially in biochemical assays); (4) Separation of mixtures (most important application); (5) Purification of a substance; (6) Recognition and control of commercial products. The affinity of adsorption seems to be augmented by the number of double bonds, hydroxyl groups and by the presence of a carbonyl group conjugated with a double bond. Slight difference in p_H sometimes is an important factor. The method is claimed to have advantages over capillary analysis in the examination of mixtures containing colored substances. It may be applied to pharmaceutical preparations.—E. I. L. ROSENBAUM. *Folia Pharm.* (Nov. 1937); through *J. pharm. Belg.*, 20 (1938), 52. (S. W. G.)

Chromium—Determination of Small Quantities of, in the Air of Industrial Plants. The chromium compounds are absorbed by passing the air through fifth-normal alkali. To 10 cc. of the solution add 2 cc. of twenty-fifth normal bromine solution, heat 10 minutes on the water-bath, cool, add 3 cc. of aqueous 0.2% normal phenol solution, neutralize with half-normal sulfuric acid, add 2 cc. of concentrated acetic acid and 1 cc. of a solution of 1 Gm. of diphenylcarbazide in 5 cc. of acetic acid and 495 cc. of rectified alcohol, shake, make to 25 cc. with water and compare with a standard prepared by similarly treating 1 to 5 cc. of a potassium dichromate solution containing 0.005 mg. of chromium per cc.—G. A. GORODETSKII and S. L. MAKHOVER. *Hig. Truda*, 15 (1937), No. 1, 84–85; through *Chimie & Industrie*, 38 (1937), 889. (A. P.-C.)

Cinchophen in the Presence of Salicylates. A sample containing about 0.15 Gm. of cinchophen is treated with 5-, 3- and 3-cc. portions of sodium carbonate solution (12.5 Gm. of $Na_2CO_3.H_2O$ per 100 cc.) and filtered. The filtrate is evaporated to dryness on a steam-bath with the aid of an air blast. The hot residue is taken up in 5 cc. glacial acetic acid, transferred with the aid of 10 cc. (or less) of glacial acetic acid to a 100-cc. volumetric flask, and heated to 90°. Twenty-five cc. of 0.1*N* iodine solution are dripped in with agitation; the flask is stoppered and allowed to cool. On cooling, the liquid is diluted to 100 cc., allowed to stand with occasional shaking for 30 minutes, and filtered rapidly, the first 15 cc. being rejected. A middle 50-cc. aliquot is titrated with sodium thiosulfate. One cubic centimeter 0.1*N* iodine is equivalent to 0.01661 Gm. of cinchophen. The method was adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 95; through *Squibb Abstr. Bull.*, 11 (1938), A-478. (F. J. S.)

Citric Acid—Color Reaction of Some Organic Acids, and Detection of Small Quantities of. Color reactions of organic acids are briefly reviewed. For a solution containing citric acid, evaporate 0.1 cc. to dryness on the water-bath, cool, add 0.5 cc. of acetic anhydride, then 2.5 cc. of pyridine, allow to stand 5 minutes, and observe the color over white paper. A rose color is formed by the presence of 0.015 mg. of citric acid.—R. CASARES. *An. Soc. Española Fis. Quim.*, 34 (1936), 594–596; through *Chimie & Industrie*, 38 (1937), 663–664. (A. P.-C.)

Cocaine and Stovaine—Detection of, in Syrups of Calcium Lactophosphate with Creosote. *Cocaine-Codeine Mixture.*—Acidify 150 Gm. of syrup with hydrochloric acid (25%), extract with ether and discard the ether solution. Alkalinize the aqueous solution with sodium hydroxide (10%). Extract with ether, evaporate the ether solution, dissolve the residue in 2 cc. dilute hydrochloric acid and several cc. of water. Extract once with ether and reject the ether solution. Alkalinize with sodium hydroxide (10%), extract with ether and evaporate the ether solution to dryness. Add 2 cc. of water and 1 cc. hydrochloric acid (25%), then add sodium hydroxide solution until just basic. Add 6 cc. chromium trioxide (3%) and mix. Extract with 5–10 cc. of chloroform. Shake the chloroform extract with 10 cc. sodium hydroxide (10%), separate and evaporate the chloroform solution. Test the residue for cocaine by dissolving in sulfuric acid (5%) and observing crystals formed with 2% potassium permanganate solution saturated with alum, platinic chloride solution and picric acid solution. Alkalinize the aqueous solution containing the chromate with sodium hydroxide (10%), extract with ether, evaporate and test the residue for codeine. *Stovaine-Codeine Mixture.*—Proceed as above, the stovaine chromate being soluble in chloroform. The crystalline salts of cocaine and stovaine are diagrammatically illustrated.—C. STAINIER and A. DENOËL. *J. pharm. Belg.*, 19 (1937), 897–903. (S. W. G.)

Copper—Iodofluoride Method for the Determination of. The sample consisting of 0.3 to 0.4 Gm. of copper sulfide is weighed into a 250-cc. Erlenmeyer flask containing measured amounts of the impurities under investigation, 20 cc. of aqua regia and 10 cc. of 18*N* sulfuric acid are added, and the reaction is allowed to proceed slowly until there is no evidence of free sulfur present. Dur-

ing this stage a small watch glass is placed over the mouth of the flask. The flask is then imbedded in a steam-heated sand-bath, the watch glass raised slightly and the solution heated just below boiling until the point of incipient fuming is reached. Twenty cubic centimeters more of aqua regia are added, and the evaporation is continued and finally finished on a gas or electrically heated sand-bath as soon as dense white fumes appear. To the solution are added 20 cc. of water and ammonia solution until a slight but distinctly recognizable odor of ammonia is obtained. Finally 1.5 Gm. of ammonium bifluoride are added, followed by iodide and titration with thiosulfate with the addition of 2 Gm. of potassium thiocyanate near the end-point. Even in those runs in which the largest amounts of iron and arsenic were present, 1.5 Gm. of bifluoride were found sufficient. When iron and manganese are present together, it is best to add the ammonia after the bifluoride. In such a case the proper amount of ammonia is determined by treating several samples in the same manner as those run for analysis, carrying the operation only to the point at which a distinct odor of ammonia is obtained. Blank runs on the copper sulfide are made, using the same procedure as that employed when impurities were present.—W. R. CROWELL, S. H. SILVER and A. T. SPIHER. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 80–81. (E. G. V.)

Copper and Urobilin—New Color Reaction between. A 1:1000 solution of urobilin gives with a neutral solution of copper (1:1,000,000) a rose, or with slightly more copper (1:100,000) purple tint. The test is less sensitive if the solution is acid, and if this is due to mineral acid a little sodium acetate should be added after neutralization. The test is unaffected by the presence of sulfate or chloride of aluminum, barium, calcium, cadmium, cobalt, bivalent tin, bivalent iron (though this intensifies the color), beryllium, lithium, magnesium, manganese, nickel, gold, platinum, strontium or zinc, silver nitrate, sodium arsenate, arsenite, molybdate or tungstate, or ammonium vanadate. A zinc salt produces a green fluorescence. The method is also suitable for the colorimetric determination of copper.—G. BERTRAND and L. DE SAINT-RAT. *Ann. Inst. Pasteur*, 58 (1937), 26–29; through *Chimie & Industrie*, 38 (1937), 668. (A. P.-C.)

Corrosive Sublimate—Gravimetric and Volumetric Determination of, by the Sodium Sulfide Method. *Gravimetric Method.*—To 10 cc. of 4% corrosive sublimate solution add 20% sodium sulfide solution to complete re-solution of the precipitate, and dilute to 150 cc.; add 20 to 30 Gm. of ammonium chloride and boil gently for 15 to 20 minutes; filter through a Gooch crucible, wash with hot water till free from chlorides, then with alcohol and once with ether; extract the sulfur with carbon disulfide and again wash with alcohol and ether; dry at 130° C. and weigh. *Volumetric Method.*—Proceed as above up to and including washing of the precipitate with hot water; transfer the filter to a flask, add 20 cc. of water, 10 cc. of decinormal iodine solution and 5 cc. of carbon disulfide, shake, let stand 1 hour and titrate the excess iodine with decinormal thiosulfate. Ammonium sulfide may be used as precipitant instead of sodium sulfide. Both methods are equally accurate.—Y. NACASE and M. TADA. *J. Pharm. Soc. Japan*, 57 (1937), 21–22; through *Chimie & Industrie*, 38 (1937), 733–734. (A. P.-C.)

Coumarin—Determination of, in Sweet Clover. A comparison of the alcoholic extraction and steam-distillation methods for removing coumarin from sweet clover samples showed considerable differences in the coumarin content as determined by the two methods. The Stevenson and Clayton method of extraction failed to recover pure coumarin added to green sweet clover, and when dry samples were extracted values of less then half those given by the distillation method were obtained. Robert's modification of the extraction method showed a decided improvement, but likewise gave lower values in most cases than did the distillation method. Spectrophotometric curves obtained from sweet clover extract did not agree closely with those obtained from alfalfa extract plus pure coumarin in the orange and red region. This probably accounts for the difficulty encountered when these solutions were compared in a colorimeter, but this difficulty was not experienced when the sweet clover distillates were compared with pure coumarin standards. Pure melilotic acid added to alfalfa samples and distilled gave 2 to 3% recovery in four distillations. The addition of sodium acetate to the sample in the distillation flask prevented melilotic acid from distilling over, but did not reduce the rate of coumarin distillation. *o*-Coumaric acid was not volatile under the conditions of distillation. Green samples should be ground with sand prior to distillation. For approximation purposes, where a high degree of accuracy is not necessary, the steam distillation method may be shortened considerably. Whereas four distillations are required to remove the coumarin completely from the sweet clover samples, one distillation removed, on the average, 56.2% of the coumarin from 5-Gm. samples and 74.9% from 2-

Gm. samples. Multiplied by suitable factors, these values can be converted to fairly satisfactory estimates of the total coumarin content. In a number of trials this method showed an average deviation of 2.6% for 5-Gm. samples.—I. J. DUNCAN and R. B. DUSTMAN. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 471. (E. G. V.)

Cuprosodic Reagent—Simplified. Dissolve 1 Gm. of powdered copper sulfate crystals in 10 cc. of warm water, and add the solution drop by drop with agitation to 100 cc. of 29.93% sodium hydroxide solution (specific gravity 1.332). A perfectly clear, brilliant blue solution is obtained which keeps very well, and 10 cc. of which is theoretically equivalent to 0.013 Gm. of glucose.—ED. JUSTIN-MUELLER. *J. pharm. chim.*, 24 (1936), 18; through *Chimie & Industrie*, 38 (1937), 450. (A. P.-C.)

Diethyl Ether—Determination of, in Commercial Preparations. Diethyl ether is an ingredient of a large number of preparations, including tinctures, collodion and other medicinal preparations, lacquers and miscellaneous proprietary articles, and it has been found necessary to evolve an accurate method for the determination of ether in such complex mixtures. A method has been devised for this purpose involving separation from other substances by aspiration, preliminary purification, absorption in sulfuric acid, regeneration and reabsorption in sulfuric acid. It is determined by oxidation with potassium dichromate with an accuracy of ±1%.—E. J. BOORMAN. *J. Soc. Chem. Ind.*, 57 (1938), 65–68. (E. G. V.)

Digitalis Lanata Ehrh.—Ingredients of the Seed of. The drug has a bitter taste. Its moisture content after drying at 100° C. is 7.4%. The ash content is 2.6%. Ether extraction yielded 30% of a yellowish green viscous turbid oil with the following characteristics: specific gravity at 20° C. 0.922, optical rotation at 20° C. 76.0°, acid number 8.0, saponification number 187, unsaponifiable residue 1.3%, iodine number 130. After removal of about one-half of the oil by compression, extraction with alcohol isolated fine tasteless crystals of digitonin sintering at 230° C. and melting at about 240° C. under decomposition. By manipulation of the mother liquors from the digitonin a very bitter glucosidal heart depressant was isolated (still bitter in a dilution of 1 in 280,000) in the form of a dirty white powder. The corresponding genin, brilliant white needles, melts above 245° C. and darkens above 225° C.—K. SZAHLENDER. *Arch. Pharm.*, 274 (1936), 446–449; through *Chimie & Industrie*, 38 (1937), 930. (A. P.-C.)

Electric Furnace for Automatic Combustion in Microelementary Analysis. An apparatus using electric furnaces of new design for the automatic combustion of microsamples is described. The furnaces fabricated from aluminum alloy are of the split type and may be conveniently opened and pushed aside so that the combustion tube may be cooled if necessary. A small electric motor with gear reduction drives a screw which in turn moves the sample-burning furnace along the combustion tube. By means of a brush contact passing over a series of insulated metal segments, the speed of the furnace is automatically varied to give slow initial burning and accelerate burning after the sample has carbonized. The furnace automatically stops when it has reached a predetermined point after the sample has been burned. The application of this type of furnace to such determinations as carbon, hydrogen, nitrogen, halogen and sulfur is described. The unit is designed primarily for laboratories having a large number of routine determinations. As the combustion of the sample is done automatically, the operator has more time to carry out calculations, titrations and weighings.—L. T. HALLETT. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 101–103. (E. G. V.)

Elutriations. An extremely sensitive test for arsenic is obtained by the use of the fungus *Penicillium brevicaule*. This fungus placed in a suitable nutrient media with minute traces of arsenic has the power of forming volatile arsenic compounds with a garlic odor.—ANON. *Chain Store Age*, 14 (1938), 50; through *Squibb Abstr. Bull.*, 11 (1938), A-196. (F. J. S.)

Ephedra Alkaloids—Determination of. The following procedure, based on the method in the B. P. Codex, is recommended. Shake 10 Gm. of the herb in No. 40 powder with 200 cc. of a mixture of 1 volume of chloroform and 3 volumes of ether for 5 minutes. Add 10 cc. of 10% solution of ammonia and 1 Gm. of anhydrous sodium carbonate, shake half-hourly for 4 hours and allow to stand over night. Transfer the mixture to a percolator and continue percolation with 100 cc. of the ether-chloroform mixture and then with ether until the alkaloid is completely extracted. Shake the combined percolates with successive quantities of 40, 30, 20 and 20 cc. of $N/3$ hydrochloric acid and then add $N/1$ sodium hydroxide until the combined acid extracts are nearly neutral. Add 10 Gm. of anhydrous sodium carbonate and sufficient sodium chloride to

saturate the solution. Extract with 20, 10, 10 cc. of chloroform followed by successive 5-cc. portions until the alkaloid is completely extracted. Three extractions are usually sufficient. Wash the combined chloroform solutions with 5 cc. of brine, the brine being washed with 5 cc. of chloroform which is added to the main bulk. Add from a pipette exactly 20 cc. of $N/10$ hydrochloric acid to the chloroform solution in a separator, shake, run the chloroform into a second separator and wash it twice with distilled water adding the washings to the acid solution in the first separator. The combined acid solution and washings are titrated with $N/10$ sodium hydroxide to methyl red. The results obtained by this method are somewhat higher and more consistent than those obtained by the B. P. Codex 1934 procedure.—F. E. RYMILL and C. A. MACDONALD. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 463–465. (S. W. G.)

Ergot—Standardization of, Comparison of Results Obtained by the Colorimetric, the Cock's Comb and the Broom and Clark Methods of Assay. Brief reference is made to various methods. Report is made of a comparison of three. It is pointed out that the only specific biological test for alkaloids that are readily soluble in water lies in use of the puerperal (human) uterus; that the Broom and Clark method is not suitable for evaluation of the new alkaloids. Smith's quantitative colorimetric method is as accurate for sparingly water-soluble alkaloids as the other two methods referred to. It is possible to determine total alkaloids so it seems reasonable to assume that the readily soluble alkaloids may be estimated by finding the difference between total and the sparingly soluble ones. Calculating either as ergotoxine ethanesulfonate or as the new ergot alkaloid. A method for determination of total alkaloids is given in detail.—ASA N. STEVENS. *J. Am. Pharm. Assoc.*, 27 (1938) 100. (Z. M. C.)

Estrin—Apparatus for the Extraction of, from Urine. An inexpensive, rapidly assembled apparatus, sufficiently lacking in rigidity to avoid being fragile, has been designed for the isolation of estrin from acidified urine by a continuous extraction with droplets of chloroform. The extract flows by gravity into a flask from which the chloroform is evaporated to leave behind the hormone, while the vaporized solvent is subsequently condensed for further passage through the urine. The apparatus is described in detail, with a diagram and a photograph.—THADDEUS J. DOMANSKI. *J. Lab. Clin. Med.*, 23 (1938), 412; through *Squibb Abstr. Bull.*, 11 (1938), A-376. (F. J. S.)

Ethanol and Ether—Analysis of Mixtures of. Phase diagrams are presented for the ternary systems benzene–ethanol–water and ethanol–ether–glycerol at 22° C. Place 30 cc. of ether and 15 cc. of 65% glycerol solution in a glass-stoppered flask, titrate the mixture to the point of critical miscibility with a standard mixture containing ethanol (2 volumes) and 65% glycerol (1 volume), and evaluate a conversion factor (f) from the equation $f = 100 \times 30/(45 + t_1)$, where t_1 is the titration volume. Then take 30 cc. of the unknown solution, add 15 cc. of 65% glycerol and, if the mixture separates into two layers, titrate with the standard mixture until the mixture becomes homogeneous and clear. The percentage of ether is given by the equation $y = f(45 + t_2)/30$, where y is the percentage of ether, t_2 is the titration volume. If the mixture does not separate into two layers, add 30 cc. of ether and 15 cc. of 65% glycerol and titrate as before. This time the percentage of ether is given by the equation $y = f(90 + t_2)/30 - 100$. Although the author made the determinations at 22° C., changes in temperature from 15° to 25° C. did not influence the results. The accuracy of the method is $\pm 0.1\%$.—J. KUBIAS. *Chem. Obzor.*, 12 (1937), 5–8; through *Chimie & Industry*, 38 (1937), 1127–1128. (A. P.-C.)

Fats and Oils—Thiocyanogen Number of. Laboratory details are given for the tentatively adopted thiocyanogen method for use in the analysis of fats and oils, including details for the preparation of reagents. The procedure is a modified Kaufmann method.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 87; through *Squibb Abstr. Bull.*, 11 (1938), A-480. (F. J. S.)

Ferric Thiocyanate Color—Intensity and Stability of. 2-Methoxyethanol is a superior medium in which to develop and compare the ferric thiocyanate color. It gives a color 85% more intense than that developed in water. Compared with the most effective acetone-water mixture, it shows 27% greater intensity of color and 96% less evaporation. It is colorless, almost odorless and can be rendered iron-free by one distillation through glass. Because of its low price and slight evaporation it is very economical. With ammonium thiocyanate it makes a clear colorless reagent which conforms to Beer's law, and, having a low dielectric constant, it effectively inhibits loss of color through dissociation. Since this new medium makes possible the development of a ferric thiocyanate color of unusual intensity and stability, it should prove especially effective for

determination of the minute amounts of iron in biological materials. The reagent solution is made by dissolving 10 Gm. of ammonium thiocyanate in sufficient 2-methoxyethanol to make 250 cc. The solution should be stored in the dark at once and left for 24 hours before using. That length of time is necessary to allow decolorization of the initial pink color formed by the iron present in even the best grade of thiocyanate. The persistence of color from such a small amount of iron is an excellent confirmation of the nondissociative nature of the solvent; in water the dissociation is instantaneous, no pink color being visible at any time. It is advisable to keep both the solvent and the reagent solution from contact with filter paper, cork and rubber to prevent contamination with iron and organic materials. If the ammonium thiocyanate is sufficiently clean there will be no need to filter. Keep away from light.—H. W. WINSOR. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 453. (E. G. V.)

Fluorescence—Adaption of Microscope to, in Analytical Chemistry. An arrangement of the lighting for the microscope in order to obtain uniform radiations in the ultraviolet range is described.—M. SERVIGNE. *Annales chim. anal. chim. appl.* (Dec. 15, 1937); through *J. pharm. Belg.*, 20 (1938), 170. (S. W. G.)

Fluoride—Removal of, from Water. Fluoride is removed by calcium phosphate, magnesium hydroxide or preferably magnesium oxide. Light magnesium oxide is more efficient (but more expensive) than calcined magnesite, while the latter, after it has exhausted its fluoride-removing properties, can be used for other industrial (building, etc.) purposes.—E. ELVOVE. *U. S. Pub. Health. Repts.*, 52 (1937), 1308; through *J. Soc. Chem. Ind.*, 57 (1938), 109. (E. G. V.)

Fluorine—Determination of Small Amounts of, in Foodstuffs. A modification of the method of Willard and Winter was used to determine fluorine in various cereals, wines, water and teeth. The material is ashed with an addition of sodium hydroxide, acidified with sulfuric acid and steam distilled, treated with alizarinsulfonic acid, neutralized and then acidified with a measured amount of hydrochloric acid and titrated with 0.01*N* thorium nitrate solution. Wine showed about 0.3 mg. of fluorine per liter; that produced in the neighborhood of a factory discharging some fluorine into the atmosphere showed 0.41–0.54 mg. and that produced from grapes sprayed with a fluorine-containing material showed 4.7 to 6.3 mg. 0.005–0.006% fluorine was found in milk teeth, the root containing more than the dentine which contained more than the enamel.—TH. V. FELLENBERG. *Mitt. Lebensm. Hyg.*, 28 (1937), 150; through *Squibb Abstr. Bull.*, 11 (1938), A-199. (F. J. S.)

Fluorine—Determination of Small Quantities of, in Vegetable and Animal Materials. The method consists in treating the material containing fluorine with powdered glass and sulfuric acid, whereby, upon heating, the fluorine is all volatilized as silicon tetrafluoride and absorbed in sodium hydroxide solution. The silicon in the receiver is then determined colorimetrically with the aid of ammonium molybdate, hydroquinone and a carbonate-sulfite solution. Color standards are prepared by mixing portions of copper sulfate solution with ammonia and small quantities of picric acid. Organic substances are first ashed and in the aqueous solution obtained by leaching the ash, the fluorine is precipitated as lanthanum acetate-fluoride. After gentle ignition the lanthanum precipitate is added to the insoluble portion of the ash and subjected to the distillation test. The technic of the determination is described in detail.—A. MAYRHOFER and A. WASITZKY. *Mikrochem.*, 20 (1936), 29–48; through *Chimie & Industry*, 38 (1937), 665. (A. P.-C.)

Fluorine—Volumetric Determination of. To the powdered sample in a fractionating flask, add ten times as much precipitated silicon dioxide that has been ignited to 1100° in order to make sure that it contains no fluorine. The neck of the fractionating flask should be closed with a two-holed rubber stopper carrying a thermometer and a tube which is attached at the top to a dropping funnel and is drawn out to a long capillary at the bottom. The thermometer and the capillary tube both dip into the liquid during the distillation. To the mixture of silicon dioxide and the sample, add 5–10 cc. of 60% hydrofluoric acid and sufficient water to make the liquid boil at about 110°. Heat the contents of the flask with an open, luminous flame until the boiling point of the liquid reaches 125–135°. Keep the boiling point at this point by adding water, from time to time through the capillary, until 75 cc. of the distillate has been collected in an open beaker. Dilute the distillate with water to 80 cc., add six drops of bromophenol blue indicator and sufficient 0.1*N* hydrochloric acid or sodium hydroxide to make the solution change from yellow toward green. Then to the solution add an equal volume of 96% ethyl alcohol and titrate with a solution containing 7 Gm. $Th(NO_3)_4.5H_2O$ per liter, to which has been added 8 cc. of cold saturated solu-

tion of quinalizarine in 96% alcohol plus 6 cc. of a similarly prepared solution of the sodium salt of alizarinsulfonic acid. During the titration, keep adding 50% ethyl alcohol so that the color, viewed laterally through the beaker, appears a pale yellow. By following these directions, excellent results were obtained in titrating Na_2SiF_6 solutions.—J. N. FRERS and HANS LAUCKNER. *Z. anal. Chem.*, 110 (1937), 251; through *Squibb Abstr. Bull.*, 11 (1938), A-198. (F. J. S.)

Fusel Oil—Evaluation of. It is found impossible to shorten the usual fractional distillation method for the determination of amyl alcohol by a preliminary dehydration of the sample, even if this is complete and ethyl alcohol also is removed. The presence of constituents other than ethyl alcohol and water which affect the composition of the vapor still necessitates the examination of the individual fractions obtained in the distillation.—W. KILP and R. BUSE. *Z. Spiritusind.*, 60 (1937), 305; through *J. Soc. Chem. Ind.*, 57 (1938), 96. (E. G. V.)

Fusel Oil—Refractometric Determination of, in Brandy. The brandy is freed from esters, distilled, adjusted to 30% by volume of ethyl alcohol, treated with ammonium sulfate and shaken with chloronaphthalene (I). At the same time an equal volume of 30% by volume of ethyl alcohol is similarly treated. In each case the change in refraction of the I layer is determined, and the per cent of fusel oil calculated therefrom by means of factors which are given for the Abbé, Pulfrich and dipping refractometers.—W. LEITHE. *Z. Untersuch. Lebensm.*, 72 (1936), 351–354; through *J. Soc. Chem. Ind.*, 56 (1937), B., 384. (E. G. V.)

Gas Analysis—High-Vacuum, Apparatus. A simple method is described for the accurate fractional analysis of light hydrocarbons, using high vacuum in the order of 1 mm. of mercury absolute. The separation is accomplished in a condenser train with temperatures controlled by liquid air. Unusual accuracy is obtained because of high vapor pressure ratio of the components at the point of separation. Individual components are determined within 0.02 to 0.1%, depending on their concentration in the original sample. Results obtained by this method have been used for equipment design and plant control over a period of years.—E. C. WARD. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 169–171. (E. G. V.)

Glycerol—Determination of. It was found that glycerol may be determined by means of ceric sulfate, the procedure ultimately developed being as follows: A mixture of 10 cc. of approximately 0.025*M* glycerol solution, 50 cc. of 0.1*N* ceric sulfate solution and 50 cc. of 2*N*-sulfuric acid is boiled under reflux for one hour. After cooling, 1 cc. of a 0.01% aqueous solution of xylene-cyanol FF is added, and the excess of ceric sulfate titrated with 0.1*N*-ferrous ammonium sulfate. Under the above-mentioned conditions one molecule of glycerol reacts with four atoms of oxygen. This is the amount of oxygen which would be required to oxidize glycerol to tartronic acid, but no attempt was made to determine whether this substance is actually formed. The effects of varying the concentration of acid, the time of boiling and the concentration of glycerol were examined. Glycerol may be determined by boiling an excess of standard hypobromite solution and determining the excess iodometrically: $C_3H_5(OH)_3 + 7(O) = 4H_2O + 3CO_2$. About 50 Gm. of potassium bromide are dissolved in a mixture of 600 cc. of water and 50 cc. of 4*N*-sodium hydroxide solution, after which 3.5 cc. of bromine are added, and the mixture is made up to one liter with water.—R. CUTHILL and C. ATKINS. *J. Soc. Chem. Ind.*, 57 (1938), 89–91. (E. G. V.)

Glycerol and Ethylene Glycol—Quantitative Determination of, in Dilute Aqueous Solution. Place the following ingredients in a 15-cm. test-tube in the order given: (1) 3 cc. of solution to be tested, (2) 3 cc. of 10% aqueous solution of catecol (freshly prepared, since such solutions color with age even if kept in a dark bottle) and (3) 6 cc. of concentrated sulfuric acid. Heat the tube (gently) for about 30 seconds. If glycerol is present, a blood-orange coloration will quickly appear at about 140° to 145° C. The color so produced is stable over a period of many days, unlike Mulliken's test which changes color after a few minutes. With ethylene glycol, diethylene glycol and ethyl alcohol, no color is formed. With other polyhydric alcohols, distinctive colors are produced, as follows:

Groups —OH	Alcohol	Color
1	Ethyl alcohol	Water-white
2	Ethylene glycol	Water-white
2	Diethylene glycol	Water-white
2	Propylene glycol	Faint pink
2	Triethylene glycol	Faint pink

2	Trimethylene glycol	Dark brown
3	Glycerol	Blood-orange
4	Pentaerythritol	Dark purple-red
4	Erythritol	Faint pink
6	Mannitol	Red-orange
6	Sorbitol (neutral)	Blue
6	Sorbitol (sulfuric acid)	Faint pink

Since the test for ethylene glycol is negative (water-white color), a confirmatory test is desirable. This may be accomplished by color differences obtained through the use of polyhydroxy phenols in the presence of sodium hydroxide.—A. C. HOVEY and T. S. HODGINS. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 509. (E. G. V.)

Glycol and Glycerol—Determination of. Measure out a sample of 50 cc. or less which is thought to contain about 2.5 Gm. or less of glycol or glycerol and remove any salt which can form a hydrate or an addition compound. Neutralize the treated sample with dilute acid or alkali, using phenolphthalein as the indicator. Transfer the sample to a pear-shaped acetylation flask and distil slowly through a 3-bulb Snyder column until the volume of liquid in the flask is reduced to about 10 cc. Remove the thermometer and stopper at the top of the column and add 50 cc. pyridine, dried over sodium hydroxide. Continue the distillation slowly until the temperature rises to 110° C. Rinse the Snyder column with approximately 10 cc. pyridine. To the acetylation flask containing the residue, or to another acetylation flask containing an aliquot of the residue after dilution to 100 cc. with pyridine, add from a Lowy automatic pipette, 25 cc. of approximately *2.6N* pyridine-acetic anhydride reagent, always measure at the same chosen temperature. This reagent is prepared by treating 154 cc. of acetic anhydride with 1 liter of dry pyridine. Acetylate by boiling the reaction mixture gently for 15 minutes. Heating for 1 hour does not harm. Treat the hot reaction mixture with 20 to 30 cc. water to convert the excess acetic anhydride to acetic acid and to rinse down the condenser, and further cool it with tap water. Titrate with approximately normal sodium hydroxide solution, using phenolphthalein as the indicator. Certain precautions should be taken during this titration to avoid the danger of saponification of the glycol acetate to glycerol acetate. The solution should be shaken continuously while being titrated to prevent the accumulation of a local excess of alkali and care should be taken to avoid over titrating it. Treat 25-cc. portions of acetic anhydride-pyridine reagent by the procedure just described to obtain blank values.—W. E. SHAEFER. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 449. (E. G. V.)

Halogen—Microdetermination of, by Combustion. The regular Pregl method for the determination of halogen and sulfur consists of burning the sample in a combustion tube with oxygen and passing the combustion gases over a spiral which is placed in the end of the tube and is moistened with a suitable absorbing solution. When the sample has been burned, the tube is allowed to cool, the absorbed products are rinsed out with distilled water and the tube is washed with acetone and then dried by the passage of a stream of air. Cooling, rinsing and drying require 5 to 7 minutes each, and where routine determinations are carried on day after day, this expenditure of time is appreciable. While the amount of actual working time during the combustion was reduced by the introduction of the electric furnace for automatic combustion, the total working time was reduced to a desirable minimum by a new design of the absorption part of the tube which facilitates the introduction and removal of the absorbing solution, permits the products absorbed to be removed immediately after combustion and eliminates the necessity for drying the combustion tube afterward. Thus, the total time required for the performance of a halogen determination was shortened by 10 to 15 minutes.—L. T. HALLETT. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 111. (E. G. V.)

Heavy Metals—Determination of Traces of, in Mineral Waters. II. The mineral water, with or without previous concentration, is treated with dithizone in carbon tetrachloride to separate the metals. The latter are dissolved in hydrochloric acid, organic matter is removed and the metals are analyzed polarographically. Details are given of the preparation of reagents and apparatus for the purpose. Data are recorded for the copper, lead, zinc and nickel contents of water from Carlsbad, Marienbad and St. Joachimsthal springs. Cadmium and cobalt could in no case be detected, while only in the last two cases were indications obtained of the presence

of bismuth.—K. HELLER, *et al. Mikrochem.*, 23 (1937), 78; through *J. Soc. Chem. Ind.*, 57 (1938), 111. (E. G. V.)

Hemoglobin—Determination of. Disadvantages of various known methods for clinical hemoglobin determination are discussed. S. has obtained good results by using the photoelectric cell to measure the concentration of hemoglobin in a measured amount of blood. The instrument used was the photolometer. When a filter was used which transmitted light only in the region of the β-absorption bands of oxyhemoglobin, the current produced by the light incident on a photosensitive cell and measured by a suitable galvanometer permitted the determination of hemoglobin concentration with an average variation of only 2% from values obtained by the Van Slyke method. Addition of 2 mg. of oxalate to each cc. of blood did not interfere with the reading. The test has been adapted to measurement of hemoglobin in 0.05 cc. of finger-tip or earlobe blood, diluted with 10 cc. of 1% sodium carbonate. The tests can be made at the convenience of the technician. A pipette for the measurement of the 0.05 cc. of blood has been designed and standardized.—W. D. STOVALL. *Modern Hospital*, 50 (1938), 84; through *Squibb Abstr. Bull.*, 11 (1938), A-397. (F. J. S.)

Homatropine in Tablets. A sample equivalent to about 0.13 Gm. homatropine is dissolved in water, treated with a little ammonium hydroxide and repeatedly extracted with chloroform. Complete removal of the alkaloid from the aqueous layer is tested for with Wagner's reagent (iodide-potassium iodide solution). The chloroform layer is washed with water, evaporated to about 5 cc. and treated with a measured excess of 0.02*N* sulfuric acid. The chloroform is allowed to evaporate spontaneously, and the cool solution is titrated with 0.02*N* sodium hydroxide, using methyl red. One cc. of 0.02*N* sulfuric acid is equivalent to 0.006233 Gm. of homatropine-HCl. The method has been adopted as tentative.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 95; through *Squibb Abstr. Bull.*, 11 (1938), A-478. (F. J. S.)

Honey—Mineral Constituents of. II. Phosphorus, Calcium and Magnesium. The silicon, phosphorus and magnesium contents were greater for dark honeys than for light. The concentrations of phosphorus, calcium and magnesium in the various samples were 23–58, 5–266 and 7–126 parts per million, respectively.—H. A. SCHUETTE and D. J. HUENINK. *Food Research*, 2 (1937), 529; through *Squibb Abstr. Bull.*, 11 (1938), A-275. (F. J. S.)

Hydrogenation Apparatus—Accurate, for General Laboratory Practice. The all glass apparatus described has been constructed for the quantitative hydrogenation of organic substances in amount varying between 0.05 and 2.0 Gm., according to the molecular weight and degree of unsaturation of the compound concerned. The system is free from wearing parts and an electrical heating attachment enables hydrogenation to be carried out at elevated temperatures.—H. JACKSON. *J. Soc. Chem. Ind.*, 57 (1938), 96. (E. G. V.)

8-Hydroxyquinoline—Coprecipitation and p_H Value in Precipitations with. The separation of metals by use of 8-hydroxyquinoline requires careful control of the p_H value during precipitation. Zinc and magnesium can be separated by precipitating the zinc with 8-hydroxyquinoline if the p_H value of the solution is kept between 4.6 and 5.5. Iron and aluminum can be separated if the p_H value of the solution is kept between 3.5 and 4.0. Coprecipitation of magnesium on zinc hydroxyquinoline at p_H 5.59 and of aluminum on ferric hydroxyquinoline at p_H 4.10 increases in accordance with Freundlich's adsorption equation until the concentrations reach certain values above which the quantity carried down remains constant. It is probable, therefore, that the coprecipitation is adsorption on the surface of the precipitate.—H. V. MOYER and W. J. REMINGTON. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 212–213. (E. G. V.)

Indicators—Fluorescent, Use of Acridine Orange and Brilliant Diazole Yellow as. Acridine orange shows a yellow-green fluorescence in more alkaline solutions. Yellow brilliant diazole NS(CNMC) is a brown powder with no fluorescence. In alkaline solutions it shows a superb luminosity of blue to violet if the solution is not too concentrated when the color changes toward yellowish green. In the presence of dilute acids, this fluorescence disappears but assumes the blue fluorescence at p_H 6.5–7.5. It is useful in solutions which are turbid or colored. The fluorescence is destroyed by oxidizing agents.—MAURICE DEBIRERE. *Ann. chim. anal. chim. appl.*, 19 (1937), 290; through *Squibb Abstr. Bull.*, 11 (1938), A-287. (F. J. S.)

Indicators—Two New Universal. Two universal indicators are proposed for estimating p_H in the limits of 1 to 7 and 7 to 14, respectively, which are composed of 0.35 Gm. thymolsulfophthalein, 0.20 Gm. tropaeolin 00, 0.10 Gm. tetrabromophenolsulfophthalein, 0.30 Gm. bromo-

cresol green and 0.40 Gm. bromocresol purple, and the other containing 0.35 Gm. neutral red, 0.15 Gm. thymolsulfophthalein, 0.25 Gm. thymolphthalein, 0.10 Gm. nitramine, 0.60 Gm. *m*-nitrophenol, respectively, per liter of 50% alcohol. Each indicator possesses a change in color in the succession of the spectrum colors from red to blue and a significant shade of color from p_H 1 to 2, etc.—J. V. DUBSKY and A. LANGER. *Z. anal. Chem.*, 107 (1936), 187–191; through *Chimie & Industrie*, 39 (1938), 48. (A. P.-C.)

Iodine—Determination of, in Organic Substances. When an organic substance containing iodine is digested with sulfuric, nitric and perchloric acids, there is a loss of iodine by volatilization; it can be retained, however, by passing the vapors through bromine water (5 cc. of bromine + 18 Gm. of potassium bromide in 500 cc. of water makes a suitable solution with which the absorption vessel can be filled). By the action of the bromine, iodic acid is formed. A 1- to 10-Gm. sample is heated with 5 cc. of a 7–2–1 sulfuric-nitric-perchloric acid mixture. The absorption flask is filled with 30 cc. of the bromine solution; in some cases two absorption flasks are used. After boiling until dense fumes are evolved, the flask is cooled carefully, avoiding back-suction of the liquid from the absorption flask into the digestion flask; sodium arsenite is added to reduce iodic acid in the digestion flask to hydriodic acid, and by further heating this is carried over into the absorber, which eventually contains all the iodine as iodic acid. The solution in the absorber is acidified with 30 cc. of acetic acid and boiled to remove chlorine (from perchloric acid) and the excess bromine; after cooling, potassium iodide is added and the liberated iodine is titrated with standard sodium thiosulfate. For every atom of iodine originally present, 6 atoms of iodine are liberated from the potassium iodide and iodic acid.—E. KAHANE and T. TOMESCO. *Bull. soc. chim. France*, 3 (1936), 1682–1687; through *Chimie & Industrie*, 38 (1937), 862. (A. P.-C.)

Iodine—Free, in Iodine Ointment. Four to five Gm. of iodine ointment are just warmed in an iodine flask, the base is dissolved in 30 cc. chloroform, treated with 30 cc. water and titrated immediately with 0.1*N* $KAsO_2$ solution (containing sufficient potassium bicarbonate to neutralize the hydrogen iodide formed), using starch as an indicator. One cubic centimeter 0.1*N* $KAsO_2$ is equivalent to 0.012692 Gm. iodine. The reagent is prepared by dissolving 4.948 Gm. As_2O_3 in concentrated sodium hydroxide (4 Gm. + 4 cc. water), adding 100 cc. saturated aqueous potassium bicarbonate, and diluting to 1000 cc. The method was adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 94; through *Squibb Abstr. Bull.*, 11 (1938), A-475. (F. J. S.)

Iodine—Organic, Simple Determination of Small Amounts of. Dehalogenation by reduction with zinc in aqueous sodium hydroxide or alcoholic potash can be used, with suitable experimental modifications, for the mineralization of iodine in various types of organic compounds and the process can be adapted for the ready determination of iodine in organic substances. Incomplete mineralization may be due either to the insolubility of the sample or to the firmness of attachment of the iodine in the organic molecule. The use of alcoholic potash eliminates most of the difficulties due to insolubility but attempts to increase the reductive power by the use of salts of nickel, cobalt, etc., are fruitless. Compounds insoluble in alcoholic potash, such as aristole, cannot be assayed by this method. Otherwise the method is applicable to many series of compounds and is not limited to the aliphatic series. It appears, however, that iodine is more firmly held in the pyridine ring of uroselectan than in the benzene nucleus of the indophenols. The method is not suitable for oily substances such as lipiodol, for nitrogen-ring compounds, nor for volatile and insoluble substances. Although not universal in its application the method is rapid and simple, needs no special apparatus and can be applied to a large number of types of substances.—J. A. GAUTIER. *J. pharm. chim.*, 25 (1937), 145–156; through *Chimie & Industrie*, 39 (1938), 50. (A. P.-C.)

Iodine Solutions—Assay of. The following summary is given: 1. The method of titration with potassium iodate in the presence of potassium cyanide may be applied to the determination of free iodine, combined iodine and total iodine in simple solution of iodine B. P., and for the determination of free iodine and potassium iodide, in weak solution of iodine, strong solution of iodine and aqueous solution of iodine. To express the result as potassium iodide, the appropriate formula should be modified by multiplying by the factor $\frac{166}{126.9}$. 2. The method may be applied to the determination of mixtures of iodide and iodate. 3. An investigation of decolorized solu-

tion of iodine B. P. C. has been made.—C. MORTON and F. R. C. BATESON. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 498–502. (S. W. G.)

Iodine and Potassium Iodide—Quantitative Determination of, in Tincture of Iodine. Various phases are studied (21 references) and the following conclusions are offered: (1) It is necessary in order to determine the free and combined iodine that the content of hydriodic acid be determined and the test for bromine be made. (2) For the separation of iodine and potassium iodide for separate determinations it is recommended that the iodine be volatilized from aliquot parts of a 50% ethyl or methyl alcohol solution of a weighed amount of the tincture and that the potassium iodide be determined in the aqueous solution remaining behind as a residue. The free iodine may be titrated in another aliquot whereby the iodine remains dissolved and starch can be used as an indicator. The remainder may be used for qualitative reactions. (3) The extractions in the Runge method are not necessary if the precautions described by Awe are observed. (4) The methods of Vieböck and Runge give equally good results for potassium iodide. (5) The Vieböck method is recommended in simplified form for the assay of iodine, iodide and galenicals containing iodine.—WALTHER AWE. *Apoth. Ztg.*, 52 (1937), 1593–1596. (H. M. B.)

Iron—Colorimetric Determination of, with Salicylic Acid. Five cubic centimeters of the standard iron solution (0.1 mg. of iron per cc.) representing 0.5 mg. of iron, were nearly neutralized by adding 1 to 1 ammonium hydroxide, drop by drop. After the addition of 1 cc. of the sodium salicylate reagent (0.1 Gm. salt per cc.), the solution was made slightly alkaline with 1 to 1 ammonium hydroxide and then just acid with 1 to 1 acetic acid added dropwise. Exactly 10 cc. of acetic acid were then added, and the solution was then diluted to 100 cc. and thoroughly mixed. The transmittancy curves were determined for a solution thickness of 1.961 cm. The absorption of the glass cell was compensated by placing in the rear beam of light a similar cell filled with distilled water. The optimum p_H value is 2.6 to 2.8. Not more than 1 cc. of reagent and 12 cc. of 1 to 1 acetic acid should be used. The color system follows Beer's law. The color is stable in diffuse light for 66 hours. All solutions should be protected from direct sunlight, however. The extent of the interference of a considerable number of common ions is great enough to require their removal before the determination is made.—J. P. MEHLIG. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 136–139. (E. G. V.)

Iron—Determination of, in Biological Materials. The reagents are prepared as follows: (1) Standard iron solution. Dissolve 1 Gm. of electrolytic iron in 10% sulfuric acid and dilute to 1 liter. Dilute 1 to 10 for use; 1 cc. of diluted standard corresponds to 0.1 mg. of iron. (2) Hydroquinone. Dissolve 1 Gm. of hydroquinone in 100 cc. of sodium acetate-acetic acid buffer solution with a p_H of 4.5. Keep the solution in the refrigerator and discard as soon as any color develops. (3) *o*-Phenanthroline. Dissolve 0.5 Gm. of *o*-phenanthroline monohydrate in 100 cc. of distilled water, and warm to affect solution. The material to be analyzed is ashed over night in an electric muffle furnace at 450° to 500° C. The ash is dissolved in the smallest possible amount of dilute hydrochloric acid (1–3) and the solution is filtered into a 100-cc. volumetric flask; if the first ashing is incomplete, the paper and residue are re-ashed, after thorough washing with distilled water, and the ash is dissolved as before and filtered into the same flask. The solution is then made to volume, and an aliquot selected for analysis which will fall within the range of accuracy of the colorimeter or the photolometer—*i. e.*, 0.2 to 0.5 mg. or 0.01 to 0.70 mg. of iron, respectively. Similar aliquots of the above unknown solution are measured into both a 25-cc. volumetric flask and a test-tube, and 2*M* sodium acetate solution is added from a burette to the test-tube until the color corresponding to p_H 3.5 is reached, using 5 drops of La Motte indicator bromophenol blue. The unknown solution in the 25-cc. volumetric flask is adjusted to p_H 3.5, using the same amount of 2*M* sodium acetate, followed by the addition of 1 cc. of (2) and 1 cc. of (3). After thorough mixing, the solutions are allowed to stand for 1 hour to assure complete conversion of the iron to the ferrous *o*-phenanthroline complex, and then made to volume and read in either the colorimeter or the photolometer. If the colorimeter is to be used, a series of standards containing from 0.2 to 0.5 mg. of iron is prepared simultaneously with the unknown. Since the color becomes yellow with dilution, it is not feasible to read lower concentrations in the colorimeter.—F. C. HUMMEL and H. H. WILLARD. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 13–15. (E. G. V.)

Iron—Determination of, with Mercaptoacetic Acid. The mercaptoacetic acid method possesses a number of advantages not found in most other colorimetric methods for total iron. Conformity to Beer's law and independence of the color with respect to the exact reagent concen-

tration and the p_H make the method easy and rapid to use. The color, while not extremely stable, does not fade so rapidly that the color comparisons are difficult. One set of standards can be used for a number of determinations. At the present time several large manufacturers are using the method for routine analyses. The method is almost completely free from interference by phosphate, pyrophosphate, fluoride, tartrate, citrate and oxalate ions, all of which exhibit a strong tendency to form stable complexes with ferric iron. For the analysis of materials which contain phosphates, the method is especially to be recommended. A number of materials interfere, but some of these are seldom found in appreciable amounts with iron. A serious fault is the use of an alkaline solution, which precipitates many metals. The limiting amounts of interfering ions are specified for a volume of 100 cc. and an iron content of 0.10 mg. With smaller amounts of iron, the apparent interference will be greater for some metals, thus lowering the amount that can be present without serious interference.—H. W. SWANK and M. G. MELLON. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 7–9. (E. G. V.)

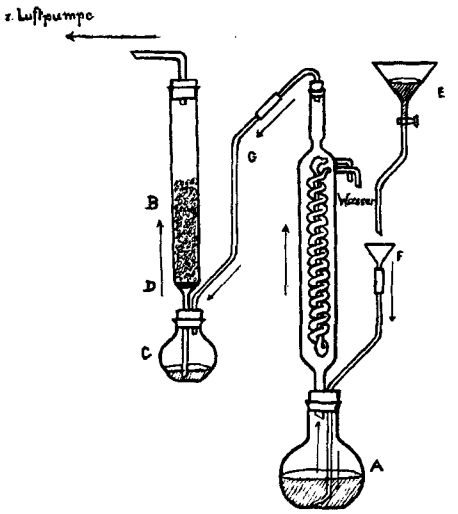
Iron—Determination of, with *o*-Phenanthroline. In determination of iron in fruit products, the color comparisons were made in graduated test-tubes and in a colorimeter. The development of the photoelectric spectrophotometer has provided a means of detecting very small color changes with a much higher degree of precision and accuracy than is possible with visual methods. A General Electric recording instrument was used in all transmittancy measurements in this work. The cells were 1.00 cm. thick, the "blank" in the reference beam of light being filled with a solution containing the same amount of hydroxylamine hydrochloride and *o*-phenanthroline as was used with iron in the other cell. All p_H measurements were made with a "universal" potentiometer and glass electrode. The standard solution of iron was prepared by dissolving electrolytic iron wire in dilute hydrochloric, nitric and perchloric acid. The solutions were then diluted to volumes such that 1.00 cc. contained 0.100 mg. of iron. A 0.10% solution of *o*-phenanthroline was prepared by dissolving the monohydrate in doubly distilled, iron-free water, heated to about 80° C. It is important that *o*-phenanthroline monohydrate be free from impurities. Certain contamination, at least, is evidenced by a pink coloration of the crystalline material, and a lowering of the melting point. A 10% solution of hydroxylamine hydrochloride, used as a reducing agent for the iron, was prepared by dissolving the reagent in doubly distilled water. Solutions used in the determination of interfering cations were prepared from the chloride or nitrate salts of the metals; the anion solutions were prepared from the sodium or potassium salts. In making up all colorimetric solutions used in this study, the following procedure was adopted: The required amount of standard iron solution was measured out; 1.0 cc. of the hydroxylamine hydrochloride was added to reduce the ferric iron; the solution was diluted to approximately 75 cc.; an excess of *o*-phenanthroline solution was added, 5.0 cc. being used with iron concentrations up to 4.0 parts per million and 10.0 cc. with higher concentrations; and the resulting solution was diluted to 100 cc. The p_H value was then determined and any desired adjustment in acidity was made. The volumes of acid or base required for this adjustment never amounted to more than 0.1 cc. of 6*N* hydrochloric acid or 6*N* ammonium hydroxide, thus keeping possible error from dilution sources below 0.1%. Solutions of possible interfering ions were added before the *o*-phenanthroline color was developed. —W. B. FORTUNE and M. G. MELLON. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 60–64. (E. G. V.)

Johimbine—New Reaction for the Identification of. The author gives the following specific reaction for the detection of johimbine: four drops of a 20% solution of chloral are added to 3 cc. of strong sulfuric acid; 10 drops of the solution in which johimbine is to be identified is added, the mixture being shaken after the addition of each drop. Upon heating this mixture a rose color is formed which changes into dark blue. It is possible to detect 0.2 mg. of johimbine. The procedure must be followed closely, otherwise a brown color which is of no value results.—M. PESEZ. *Süddeut. Apoth.-Ztg.;* through *Pharm. Tijdschr.*, 14 (1937), 218. (E. H. W.)

Lactic Acid—Preparation of. Process for fabricating lactic acid and sodium and calcium lactates, pure and colorless. Milk fermented by *Lactobacillus bulgaricus* and *mycoderma*, transformed to calcium lactate by addition of lime. Calcium lactate dissolved in water plus sulfuric acid to liberate lactic acid, filtered off from resultant calcium sulfate and purified by carbon. Sodium lactate precipitated by addition of sodium hydroxide to lactic acid.—ANON. *Rev. chim. ind.*, 6 (1937), 44. (G. S. G.)

Lactic Acid—Quantitative Determination of, in Pharmaceuticals Containing Lactates. The following modification of Fürth-Charnass method is proposed: Oxidize the lactic acid in a flask A

(250 cc. capacity) with potassium permanganate at boiling temperature; the permanganate is added from a stock flask E through tube F which dips into the liquid contained in A. By means of a suction pump attached to vessel B (35 cm. long and 3 cm. wide) air is drawn through the apparatus to remove the acetaldehyde from A as soon as it is formed to avoid further oxidation. The acetaldehyde is absorbed in a sulfite solution in C and on glass beads (column of beads 16 cm.) in B resting on a perforated porcelain plate or a Gooch crucible or on glass wool. Attached to A is a reflux condenser, 30 cm. long. Solutions required are: (1) Manganous sulfate-sulfurous acid: 25 Gm. manganous sulfate in 225 cc. water and 4.5 cc. concentrated sulfuric acid. (2) Potassium permanganate solution which is about 0.02*N* containing 1.5 cc. concentrated sulfuric acid per liter. (3) Sulfite solution: 1.5 Gm. potassium meta-bisulfite in 250 cc. water. (4) 0.1*N* Iodine solution. Into A add the lactate solution from a pipette (equivalent to about 15 mg. lactic acid), add 20 cc. of solution (1) and dilute to 100 cc. with water. In C add 20–30 cc. of solution (3). Suction is applied and solution (3) is drawn into tube B so that the glass beads are wetted but at not sufficient speed that the liquid spatters upward. Heat A to boiling, add solution (2) drop by drop until the liquid becomes a permanent red or manganese dioxide separates and then continue drawing air through the boiling liquid for 10 minutes to remove the acetaldehyde completely. Remove the stopper from B and rinse the beads three times with water, which is collected in a liter flask; transfer the contents of C to this flask as well as the drops of liquid condensing in tube G. Add starch solution to the flask and then from a burette 0.1*N* iodine solution until a blue color appears. By careful addition of sulfite solution from a burette, decolorize the blue color and then bring it back by the addition of 0.01*N* iodine solution. The bisulfite compound of the acetaldehyde is decomposed by the addition of a little solid sodium bicarbonate as shown by the disappearance of the blue color and again titrate with 0.01*N* iodine solution to a blue color, repeating these steps until the blue color no longer disappears upon the addition of the last portion of bicarbonate. 1 cc. 0.01*N* iodine solution is equivalent to 0.45 mg. of lactic acid.—A. KICHLER and G. SAIKO. *Pharm. Monatsh.*, 18 (1937), 221–222. (H. M. B.)



Lead—Microreactions of. Precipitation of lead as lead chloride permits of identifying it in presence of 100 times its weight of silver, 80 times its weight of mercury, etc. It is less reliable in presence of tin, bismuth and copper. By precipitation as lead iodide 0.5γ of lead can be identified in presence of 100 parts of tin or of mercuric mercury, 50 parts of cadmium, 25 parts of copper, silver or mercurous mercury or 10 parts of bismuth. Presence as sulfate can be carried out in presence of 400 parts of mercury, 200 of silver and 100 of calcium; it cannot be used in presence of barium and strontium. By precipitating as the complex potassium-copper-lead nitrite, lead can be identified in presence of 150 parts of barium, strontium, calcium, bismuth, copper, cadmium, tin, iron, chromium, aluminum, manganese, zinc, cobalt or nickel.—I. M. KORENMAN and SCH. MESSONSHNIK. *Microchem.*, 20 (1936), 189–193; through *Chimie & Industrie*, 38 (1937), 659. (A. P.-C.)

Lead—Rapid Colorimetric Determination of, in Maple Syrup. Weigh 15 Gm. of syrup into a clean 100 to 125 cc. oil sample bottle or other tube suitable for centrifuging, add 15 cc. of 2*N* hydrochloric acid, and mix well. Add 15 to 25 cc. of water, 15 cc. of ammonia-cyanide-citrate reagent and exactly 15 cc. of strong dithizone solution (30 mg. per liter of chloroform). Shake vigorously (100 to 200 times) and whirl in a centrifuge to separate the layers. Transfer exactly 11 cc. of the dithizone layer with a pipette to a 100-cc. separatory funnel containing 11 cc. of 6% hydrochloric acid. To remove the chloroform dithizone mixture, place the finger on the pipette before immersion in the liquid and allow the tip to come in contact with the bottom of the tube

before removing the finger. Draw the mixture above the 11-cc. mark, remove the tube and wipe the pipette tip with a clean cloth before adjusting to the mark. Shake the funnel vigorously (200 times) releasing the pressure several times, allow the layers to separate cleanly, and draw off the chloroform-dithizone mixture from which the chloroform can be reclaimed later. Pipette 10 cc. of the aqueous acid layer into a Nessler tube, add 10 cc. each of ammonium-cyanide-citrate (dissolve 20 Gm. of potassium cyanide and 10 Gm. of citric acid in 500 cc. of ammonium hydroxide, approximately 28% ammonia, and dilute to 1 liter) and weak dithizone (15 mg. per liter of chloroform), stopper and shake vigorously. Allow the layers to separate and compare the dithizone colors with the standards in a comparator block. When the sample contains more than 0.027 gr. per pound of lead, use a 5-cc. aliquot with 5 cc. of blank acid and multiply the result by 2. If more than 0.050 gr. per pound is present, it is advisable to use 30 cc. of strong dithizone as in initial extraction and a 5-cc. aliquot as above and multiply the results by 4. For amounts of more than 0.100 gr. per pound use a smaller initial sample. Make a blank determination for the reagents in the above manner, substituting 15 cc. of water for the syrup. Make color comparisons with a tube of clear chloroform backing the sample tube and tubes of chloroform which have been shaken with blank acid and ammonia-cyanide-citrate solutions backing two standard tubes on both sides of the sample tube. Use a comparator block allowing the minimum space between tubes with a uniform light source. The use of artificial light in conjunction with a Corning ground-glass daylight filter is satisfactory. View the colors at right angles to the tube lengths. Since the standards are made up in intervals corresponding to 0.003 gr. per pound, it is necessary to interpolate when reading the sample tube. This can be conveniently done to within 0.001 gr. per pound (gr. per pound × 143 equals parts per million).—J. L. PERLMAN. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 134–135. (E. G. V.)

Lunasia Costulata Miq. Bark—Constituents of. After reviewing the work of other investigators on this bark, the authors undertook a more precise study of the constituents. The bark contains some starch in both its outer and inner portions, likewise a nondrying alkaloid-free fatty oil with a greenish color; it is devoid of pharmacological action. The oil contains 5.65% stearic acid, 13.76% palmitic acid, 60.38% oleic acid, 15.66% linolenic acid and 2.12% unsaponifiable. The bark contains 3 alkaloids: lunacrine, lunasine and lunacridine, all of which have now been isolated in the pure state. The last named has the composition $C_{16}H_{20}NO_8$; when crystallized from water or ether it has one molecule of water of crystallization and melts at 95° to 96° C.; in the anhydrous form it melts at 115° to 116° C. This alkaloid is weakly basic and forms salts with hydrochloric, hydrobromic, hydriodic and picric acids and with gold chloride. From 10 kilos of bark 8.3 Gm. of crude alkaloids were obtained, which could be separated into 6.8 Gm. pure lunacrine, 0.9 Gm. lunasine and 0.03 Gm. lunacridine. Experiments on the determination of the constitution of these alkaloids are contemplated.—H. DIETERLET and H. BEYL. *Arch. pharm.*, 275 (1937), 174–191; through *Chimie & Industrie*, 38 (1937), 735. (A. P.-C.)

Mandelic Acid and Novatropin—Quantitative Determination of. (1). The partition of mandelic acid between aqueous hydrochloric acid solutions and various organic solvents was studied. Mixtures of chloroform and isopropyl alcohol were not found suitable for quantitative extraction, for from 3–10% of the mandelic acid was volatilized during evaporation of the extract. Isolation was effected by 5 or 6 extractions with a double volume of ether. The ether must be evaporated to a few cc. on a water-bath at about 80° C. The residue is evaporated by tilting and rotating the flask. The mandelic acid is dissolved in water and titrated with 0.1*N* sodium hydroxide (phenolphthalein indicator). Various pure and impure preparations of calcium amygdalate and of mandelic acid were analyzed by this method. (2). Either of two previously described methods for assay of methylatropine solutions proved satisfactory for assay of novatropin (methyl homatropine bromide): (*a*) hydrolysis with sodium hydroxide and shaking out of the tropic acid from acid solution, followed by titrimetric determination, or (*b*), direct determination, adding a known amount of 0.1*N* sodium hydroxide and after 30–60 minutes standing, determining the amount of alkali which had been neutralized by the freed tropic acid. Analyzing two commercial preparations of novatropin, both methods indicated the presence of only 98% of methyl homatropine bromide.—F. REIMERS. *Dansk Tids. Farm.*, 12 (1938), 25. (C. S. L.)

Maple Products—Analysis of. By treatment with hydrogen sulfide, cold and hot, and with dilute sulfuric acid, the precipitate produced from maple syrup by treatment with basic lead acetate was separated into fractions A, B and C. Fraction A yielded malic and citric acids and an

oily liquid yielding a 2,4-dinitrophenylhydrazone of melting point 95° C. A carbohydrate gum was detected in fraction B and its hydrolysis product in fraction C. Phlobatannins were indicated in all three fractions.—I. E. PUDDINGTON and J. F. SNELL. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 132–134. (E. G. V.)

Marihuana Investigation—Report of the. The Bureau of Narcotics had the responsibility of collecting all significant data and, in order to assist in getting information, planted a plot of ground and watched its growth. An extensive study was made of the findings of experts. Purposes of the investigation were as follows: (1) To observe the growth of the plant *Cannabis sativa*. (2) To standardize the method of testing the plant *Cannabis sativa*. (3) To observe statistical relationships, if any, obtaining between those plants which gave "positive" tests by chemical methods, and those plants which gave "negative" tests. (4) To determine the statistical relationship, if observable, between male and female plants which reacted to chemical tests. (5) To observe the time of occurrence in male and female plants of those compounds which caused "positive" reaction to chemical tests. (6) To determine the effect on the development of "positive" tests of variations in the drying of the plants. The report covers observation of the growth of the plant *Cannabis sativa*, estimation of the yield of flowering tops, a study of methods of testing and adoption of one, statistical relationship between "positive" and "negative" plants, a diagrammatic sketch of the plant, distribution of "positive" and "negative" plants with respect to sex, time of occurrence in the various parts of male and female plants of the compounds which cause "positive" reaction. The authors summarize their findings as follows: (1) That the alkaline Beam test, as employed and elsewhere described in this report, only gave a "positive" reaction on two-thirds of the plants. (2) That the proportion of male plants reacting "positive" to the alkaline Beam test is the same as the proportion of female plants. (3) That at no time during the growth of the plant was "positive" alkaline or acid Beam test to be obtained from the pith, lower stalk or roots. (4) That plants as small as three inches above ground have the capacity of giving the alkaline Beam test. (5) That the alkaline Beam test and the acid Beam test may result from more than one compound, or may be affected by the presence of other inhibiting compounds which result in a non-uniformity in the degree to which both tests are obtained. (6) That the dried, old fruits give neither test. (7) That neither the alkaline nor acid Beam test, either as hitherto proposed or as developed to date, offer any assurance as means of identification from a criminological viewpoint.—H. J. WOLLNER, JOHN R. MATCHETT, JOSEPH LEVINE and PETER VALAER. *J. Am. Pharm. Assoc.*, 27 (1938), 29. (Z. M. C.)

Medicine—Indian Indigenous, Inorganic Preparations of. II. Banga Bhasma (Calcined Tin). III. Lauha Bhasma (Calcined Iron). IV. Raupya Bhasma (Reduced Silver). U. Swarna Bhasma (Reduced Gold) and Gold Kusth. The chemical compositions of the preparations and their soluble portions are given.—R. N. CHOPRA, S. GHOSH and A. DUTT. *Indian J. Med. Research*, 24 (1936–1937), 257; through *J. Soc. Chem. Ind.*, 57 (1938), 102. (E. G. V.)

Melting Point Determination under Mercury. The method proposed consists essentially of affixing a small piece of the original solid to the bulb of a thermometer by means of a piece of wire. The thermometer bulb is then submerged in a relatively large volume of mercury contained in a small beaker, so that the solid is completely surrounded by mercury except where it is held by the wire. The beaker is heated directly, so that the mercury serves as a bath medium. A good sample size is about 0.1 cc. The wire holder should be of material not forming an amalgam. The heating rate should be approximately 5° C. per minute. Since there is a rather large exposed surface of hot mercury, it is essential that the work be carried out under a hood or that other means be provided for protection against the mercury vapor.—M. A. COLER. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 164–165. (E. G. V.)

Mercurous Ion—New Micromethod for Detecting. To a drop of the solution to be tested add a drop of a 2% solution of sozoiodol (di-iodophenol-*p*-sulfonic acid). In the presence of 5γ or more of monovalent mercury, rosettes of bright yellow needle crystals form. The precipitate is insoluble in dilute sulfuric or nitric acids. Under the same conditions divalent lead may form a pale yellow precipitate. The precipitates formed by other cations are white.—R. LOBO. *An. Farm. Bioquim. (Buenos-Aires)*, 7 (1936), 1–2; through *Chimie & Industry*, 38 (1937), 660. (A. P.-C.)

Microfusions—Procedure for. Each residue was obtained in the course of the analysis as a thoroughly washed powder driven into the apex of a microcentrifuge tube. It was withdrawn

as a slurry by means of a capillary pipette and deposited upon a platinum ribbon 0.025 × 1.50 mm. which was gently heated by a current. By careful manipulation of the pipette it was easy to concentrate the dried material in about 4 mm. of the ribbon length, all on the upper side. It adhered well enough for the subsequent handling. The end of a piece of 0.508-mm. platinum wire was bent into an elongated crook slightly smaller in external dimensions than the section of ribbon carrying the dry residue. This crook was filled with the desired amount of flux (potassium sodium carbonate) by the process of dipping and fusion in the microflame. The section of ribbon was then cut out with scissors and received on the corner of a slide. The flux on the wire was next re-fused and quickly touched to the deposit on the ribbon section held close to the flame on its side. Ribbon and all were thus picked up. Upon reheating, capillary action at once drew the section into a symmetrical position on the crook and held it there, permitting thorough contact of sample and flux during the subsequent fusion, even with a moderate blast. No tendency to creep was observed. Where creeping occurs, however, it can usually be prevented by using a wide flame with its center directed upon the wire shank beyond the fusion so that the heat gradient is always downward to the fusion.—C. VAN BRUNT. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 224. (E. G. V.)

Moisture—Cryohydric Method for Determination of. The cryohydric method is as accurate as are direct methods of distillation with benzene or mesitylene, or drying in nitrogen. Absolute ethyl alcohol is not necessary and kerosene should be replaced by benzene in testing for high moisture.—N. V. MIKULINA, A. I. KARELIN and A. P. SCHACHNO. *Koks i Khim.*, No. 4 (1934), 60–64; through *J. Soc. Chem. Ind.*, 57 (1938), 330. (E. G. V.)

Morphine—Colorimetric Determination of. *Aromatic Powder of Chalk with Opium.*—Mix intimately 4 Gm. of sample with 0.5 Gm. of slaked lime in a mortar, add water to make a paste and then transfer quantitatively to a 100-cc. flask with water until about 90 cc. have been used. Shake the mixture occasionally during 30 minutes, make up to volume and filter. Add 0.15 Gm. of ammonium sulfate to 25 cc. of filtrate, extract three times with ether, wash the ether with 5 cc. of water and reject the solvent. Extract the aqueous liquid as in the official method (B. P.) for camphorated tincture of opium and make the residue, obtained after evaporation of solvent, up to 25 cc. with $N/1$ hydrochloric acid before matching. *Powder of Ipecac and Opium.*—Mix intimately 1 Gm. of sample with 0.5 Gm. of slaked lime in a glass mortar. Add water gradually and transfer quantitatively to a 100-cc. graduated flask. Shake the mixture (approximately 90 cc.) frequently during 30 minutes; make up to 100 cc., shake and filter. Extract 25 cc. of filtrate first with ether and then, after adding ammonium sulfate, with alcohol and chloroform as in the B. P. assay of camphorated tincture of opium. Dissolve the residue in 25 cc. of $N/1$ hydrochloric acid. Match against standard morphine solution as usual, a convenient amount being 5 cc. of extract and 5 cc. of 0.1% anhydrous morphine solution. *Gall and Opium Ointment B. P. C.*—Extract 3.5 to 4 Gm. of ointment with light petroleum in a Soxhlet apparatus until the residue is free from fat (3 hours). Dry the residue and continue the assay on the total dry powder as given for Dover's powder. *Tincture of Chloroform and Morphine B. P. C.*—Add 5 cc. of water to 10 cc. of tincture in a separator, followed by 0.5 cc. of 0.880 ammonia, 15 cc. of alcohol and 15 cc. of chloroform. After shaking and separating, repeat the extraction twice with 8 cc. of alcohol and 15 cc. of chloroform, washing the solvent each time with the same portion of 15 cc. of a 1:2 mixture of alcohol and water. After evaporating the solvent, dissolve the residue in 75 cc. of $N/1$ hydrochloric acid and match 2 cc. against a standard morphine solution.—D. C. GARRATT. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 466–470. (S. W. G.)

Morphine—New Chromatic Reaction of. Use of liquid bromine in sulfuric medium with morphine, diluting whole with distilled water to characteristic green color.—M. PESEZ. *J. pharm. chim.*, 25 (1937); through *Rev. brasil med. pharm.*, 13 (1937), 73. (G. S. G.)

Morphine—New Functional Color Reaction of, and Its Pseudolic Derivatives. In the Gulland and Robinson formula for morphine, the pseudolic group is CHOH in ring number 1 of its phenanthrene nucleus. In dilaudid, dicolid and eucodal this group is replaced by CO. Morphine derivatives containing the pseudolic group give the following reaction with vanillin hydrochloride reagent (0.30 Gm. of purest vanillin in 100 cc. of official hydrochloric acid): to a few mg. of alkaloid in a dry test-tube add 1 cc. of the reagent and warm in boiling water; in a few minutes a very stable violet-red coloration is obtained. The above derivatives containing CO do not give this reaction, but will do so after the CO group is reduced by warming, *e. g.*, 0.01 to 0.02 Gm. with 5

drops of concentrated hydrochloric acid, 2 drops of water and 1 Gm. of granulated zinc on the hot water-bath for at least 2 min.—J. A. SANCHEZ. *J. pharm. chim.*, 25 (1937), 346–351; through *Chimie & Industry*, 38 (1937), 736. (A. P.-C.)

Nicotine—Turbidimetric Titration of Small Amounts of. An inexpensive photoelectric apparatus, including a special titration cell, is used for the turbidimetric titration of small amounts of nicotine. The unknown nicotine sample is added to an excess of silico-tungstic acid and the excess of the latter is titrated with standard nicotine formate. Results that check to about 5 micrograms can be obtained. Flocculation of the precipitate is prevented by the addition of Irish moss extract, and the tendency to crystallize is retarded by using formic acid instead of hydrochloric acid as in the analysis by the gravimetric method.—L. D. Goodhue. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 52–54. (E. G. V.)

Nitrogen—Application of Sulfuric Perchloric Acid to the Destruction of Organic Matter Prior to the Detection of. Add 1 cc. of concentrated sulfuric acid to a little of an organic substance containing nitrogen in a 25-cc. Pyrex tube, heat to boiling and add 22% perchloric acid dropwise until a clear solution is obtained. Cool, add an excess of sodium hydroxide and boil. Test the escaping gas with litmus or with Nessler's reagent.—HENRIETTE GAUDUCHON-TRUCHOT. *Ann. chim. anal.*, 18 (1936), 316–317; through *Chimie & Industrie*, 38 (1937), 665. (A. P.-C.)

Nitrogen—Critical Study of the Iodometric Microdetermination of. In the microdetermination of ammonia nitrogen by the addition of an excess of sodium hypobromite and iodometric determination of the undecomposed hypobromite, accurate results are obtained with pure solutions of ammonium salts, but when the method is applied directly to a Kjeldahl digestion, without distillation, large errors always occur. With pure urea solutions, the method gives results about 4% low; if buffer salts are present the results may be as much as 20% low. Possible causes of error are discussed.—S. MORGULIS and A. F. FRIEDMAN. *Bull soc. chim. biol.*, 18 (1936), 1074–1080; through *Chimie & Industrie*, 38 (1937), 445. (A. P.-C.)

Nitrogen Monoxide—Further Study of the Assay of. Report is made of some modifications of a method introduced earlier and comparisons are made with other procedures. Experimental work is given in some detail. Shortcomings of the method are mentioned. Other methods are discussed. The authors conclude that the water solubility method with minor modifications is reasonably accurate and yields concordant results on standard mixtures of N_2O and N_2.—FREDERICK K. BELL, C. JELLEFF CARR and JOHN C. KRANTZ, JR. *J. Am. Pharm. Assoc.*, 27 (1938), 103. (Z. M. C.)

Nitroglycerin—Determination of. Most of the published methods for the determination of nitroglycerin require considerable care and an appreciable amount of time for their completion. Furthermore, if the nitroglycerin has to be previously extracted by means of a solvent, it is often accompanied by other ingredients, the presence of which would tend to vitiate the results obtained by ordinary methods. A simple and rapid method for the determination of nitroglycerin which is not affected by the presence of many of the compounds likely to be associated with the nitric ester is therefore of appreciable value. It has been found that nitroglycerin is rapidly and quantitatively reduced by means of a standard solution of titanous chloride, and by this means it is possible to determine it with an accuracy of approximately $\pm 0.3\%$ even in the presence of certain restrainers and stabilizers.—H. SHANKSTER and T. H. WILDE. *J. Soc. Chem. Ind.*, 57 (1938), 91–92. (E. G. V.)

Palmitate Determination of Magnesia in Water—Modification of. In the determinations of hardness by the Blacher (palmitate) method, it has been usual to precipitate the calcium hardness with sodium oxalate and to titrate the remaining magnesia hardness against potassium palmitate (I). The end-point of this titration has been found to be indefinite. If the magnesia hardness is precipitated and the remaining calcium hardness titrated against I, the end-point is much more definite, a series of results on mixtures of solutions of magnesia and calcium salts showing that the error is usually less than 0.5 part of calcium carbonate/10^6; the magnesia hardness is then found by subtracting the calcium hardness from the total hardness previously determined.—P. HAMER and H. E. EVANS. *J. Soc. Chem. Ind.*, 56 (1937), 441T. (E. G. V.)

Papain—Proteolytic Activity of. If unactivated, the sample is prepared by grinding the enzyme preparation with cold, freshly boiled water, and diluting to form a suspension in the proportion of 10 mg. of the original substance per cc. After 5–10 minutes, the sediment is centrifuged out. If the sample is activated, half-saturated hydrogen sulfide water is used and after

centrifuging, the enzyme solution is incubated at 40° for one hour to complete the activation. Ten cc. of a 6% solution of Hammarsten's casein and a small charge of 4 mm. glass beads are placed in each of several 125-cc. glass-stoppered bottles and brought to 40°. The desired volume, which should not exceed 4 cc., of prepared enzyme solution is added, and immediately buffered to a p_H of 5.0 ± 0.1 with mono-sodium citrate. The mixture is shaken and then incubated for 20 minutes at 40°, counting the time from the addition of the buffer. One cc. of a 1% alcoholic solution of thymolphthalein is added and the solution titrated with 0.1*N* alcoholic potassium hydroxide, with shaking to remove the blue color and to dissolve the precipitate. When all of the precipitate has been dissolved, the solution is transferred to a 400–500-cc. flask using a total of 25 cc. of alcohol to effect the transfer. Sufficient alcoholic potassium hydroxide is added to restore the blue color, then 175 cc. of boiling alcohol. More alcoholic potassium hydroxide is carefully added until a pale but distinct blue color persists in the solution. A control is run in which no incubation time is allowed. The difference in time between the titration of the undigested sample and that of the digested sample is a measure of the proteolytic action of the enzyme. For smaller amounts of enzyme the extent of hydrolysis determined by the titration described is a straightline function of the amounts of papain used. Quantities of enzymes giving titration differences of 0.6–1.2 cc. of 0.1*N* potassium hydroxide are recommended. The unit of papain is that quantity of enzyme that produces a titration difference of 1 cc. of 0.1*N* potassium hydroxide. The value of the original preparation is then expressed in units per mg., or as mg. necessary to make one unit.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 97; through *Squibb Abstr. Bull.*, 11 (1938), A-478. (F. J. S.)

Para-Aminobenzenesulfonamide—Notes on the Colorimetric Assay of. Some modifications are suggested for the method of Marshall, Emerson and Cutting who used dimethyl-α-naphthylamine to produce a red color which may be estimated in a colorimeter after diazotization with sodium nitrite. Because of liability to reddish color in the dimethyl-α-naphthylamine, it should always be freshly distilled if not of a clear straw color. It is important also to use no more than 1 cc. of 0.1% sodium nitrite solution for the diazotization in order to avoid a brown color which gives low results. The color produced by para-aminobenzene-sulfonamide in pure water is stable for several hours but the color produced in urine reaches its maximum density in five minutes and comparison with the standard should be made within ten minutes. Longer standing tends to produce an orange color which gives low results. The modified method is given in detail.—ASA N. STEVENS and EDWARD J. HUGHES. *J. Am. Pharm. Assoc.*, 27 (1938), 36. (Z. M. C.)

Perfumes—Analysis of Natural. Concrete Essences, Perfumery Products, Absolute Essences. A thorough review of methods of preparation, the common adulterants and methods for their detection is given.—Y. R. NAVES, S. SABETAY and L. PALFRAY. *Ann. chim. anal. chim. appl.* (Aug., Sept. 1937); through *J. pharm. Belg.*, 20 (1938), 7. (S. W. G.)

Perfumes and Essential Oils—Analysis of, in Relation to Their Use in Cosmetics, Diene Value of Some Essential Oils. For an accurate determination of the diene value it is essential to conduct the reaction in a closed vessel; mere refluxing as used by Sandermann affords only approximate figures. Menthol, terpineol, citronellol, and cinnamyl alcohol show no diene value. The diene values of a number of essential oils containing phellandrene, mrycene, ocimene and terpinene are reported, showing considerable differences between the commercial types of the same oil. The diene values obtained by means of the more rapid micro-test, using 0.01 Gm. of sample, agree excellently with the values obtained on the macro-scale.—H. P. KAUFMANN, J. BALTES and F. JOSEPHS. *Fette u. Seifen*, 44 (1937), 506–508; through *J. Soc. Chem. Ind.*, 57 (1938), 320. (E. G. V.)

Petroleum Wax. I. Determination and Analysis of Wax. Wax in oil (or oil in wax) is determined by crystallizing from dichloroethane or chloroform at −35° or −55°, respectively, in a special apparatus (described). Various wax fractions can be separated and examined by separating the wax at successive temperatures. The use of 75 cc. of solvent per Gm. of oil is satisfactory. The dichloroethane method, in contrast to the Holde method, removes low- as well as high-melting waxes. Chloroform is preferable to dichloroethane for very paraffinic oils. A 50/50 mixture of dichloroethane and toluene gives less wax than pure dichloroethane or chloroform. Clean separation of oil from low-melting wax is not possible with the mixed solvent. Dichloroethane gave sharper separation of the wax fractions than either of the other solvents.—

D. S. McKittrick, H. J. Henriques and H. I. Wolff. *J. Inst. Petroleum Tech.*, 23 (1937), 616. **II. Composition of Waxes.** Physical properties of 95 pure hydrocarbons are tabulated. Wax fractions can be conveniently characterized by the melting point and refractive index (n_D^{90}). Curves are given showing the relation between the melting point and n_D^{90} of pure hydrocarbons and for fractions of a number of distillate waxes. It is considered that high-melting waxes consist chiefly of normal paraffins, whereas in fractions with successively lower melting point, isoparaffins, naphthenes and aromatics may predominate. The higher-melting fractions or residue waxes are not chiefly *n*-paraffins but contain non-paraffins. Eastern, Mid-continent and Western American crudes differ considerably, but the distillate waxes are similar. Residue waxes differ and show characters related to the parent crudes. Petrolatums were shown to be mixtures of moderately hard waxes and oils of low pour point. The higher-melting fractions appear to be naphthenes.—*Ibid.*, 628; through *J. Soc. Chem. Ind.*, 57 (1938), 23. (E. G. V.)

Pharmaceuticals—Use of Drop Tests in the Examination of, Detection of Sugars and Other Carbohydrates. In a small high-walled crucible place a little of the substance and mix it with about 8 mg. of oxalic acid and a few drops of dilute sulfuric acid. Heat carefully until the reaction starts. As soon as the contents begin to turn brown, cover the crucible with a small watch glass upon the under side of which is stuck a piece of filter paper impregnated with *o*-dianisidine (I) in glacial acetic acid. If a sugar is present the paper soon assumes a violet tint. Furfurole derivatives are formed as a result of the prolonged heating and these condense with I to form Schiff bases. By this test it is possible to detect 0.05 mg. *d*-glucose or levulose, 0.1 mg. sucrose or lactose, 0.01 mg. amylum sago, -maranthæ, -solani or -maidis, 0.05 mg. agar-agar, 0.01 mg. tragacanth, 0.005 mg. gum arabic and 0.01–0.02 mg. cellulose. By means of alkaline hypochlorite solution, α-amino acids can be converted into aldehydes containing one less carbon atom and the aldehyde formed can be detected by fuchsin-sulfurous acid. Place a little of the substance in a microcrucible, add a few drops of saturated NaClO solution and heat gently. After the reaction has taken place add dropwise some 0.1% fuchsin solution decolorized with sulfur dioxide. By this test 0.06 mg. glycine, 0.1 mg. alanine, asparagic acid or tyrosine, 0.05 mg. diiodotyrosine and 0.06 mg. *d*-arginine can be detected.—O. Frehden and L. Goldschmidt. *Microchem. Acta*, 2 (1937), 184; through *Squibb Abstr. Bull.*, 11 (1938), A-532. (F. J. S.)

Phenol—Acidimetric Conductometric Determination of, in Presence of Fatty Acids. The phenol-acetic acid mixture is titrated conductometrically with sodium hydroxide for total acids and with aqueous ammonia to determine acetic acid. The method may be used to determine phenol and acetic acid in concentrations as low as 0.001*N*; the concentration of either component can be 10 times that of the other.—M. L. Lapschin. *Zavod. Lab.*, 6 (1937), 1405–1409; through *J. Soc. Chem. Ind.*, 57 (1938), 350. (E. G. V.)

Phenols—Analysis of Mixed. The various analytical methods proposed are reviewed. Bruckner's method for separating phenols, *e. g.*, phenol and mixed cresols, by fractional hydrolysis of their sulfonic acids was investigated. Quantitative results could not be obtained.—T. Bahr and K. Wiedeking. *Ges. Abh. Kenntn. Kohle*, 12 (1937), 176–182; through *J. Soc. Chem. Ind.*, 57 (1938), 136. (E. G. V.)

Phenothiazine—Commercial, Analysis of, Used as an Insecticide. The method for the preparation of phenothiazine on a commercial basis consists in heating 1 mol of diphenylamine with 2 atoms of sulfur at about 180° C., using iodine as a catalyst. The reaction is practically quantitative, and for use as an insecticide no purification of the product is necessary. However, a dark green compound, which is insoluble in anhydrous ethyl ether, is formed in varying quantities. When tested against certain species of insects, this compound has been found to be relatively nontoxic. Its chemical nature has not been fully determined, but it appears to be isomeric with, or a polymer of, phenothiazine. The insolubility of this green material in anhydrous ethyl ether is utilized in analyzing commercial phenothiazine. A weighed amount of the compound is placed in a tared Soxhlet thimble and extracted with ether in the usual manner. The residue, which consists of the green material, is then determined from the increase in weight of the dried thimble. Little or no unchanged diphenylamine has been found in samples of commercial phenothiazine.—L. E. Smith. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 60. (E. G. V.)

***p*-Phenylenediamine—Differentiation between, and Other Diamines Used as Hair Dyes.** To differentiate between *p*-phenylenediamine and other hair dyes, a reagent containing 5.0 Gm. of cobalt nitrate and 1.0 Gm. of ammonium thiocyanate in 10 cc. of water, or one containing 5.0

Gm. of mercuric chloride and 5.0 Gm. of ammonium thiocyanate in 6 cc. of water, can be used. With the first reagent, *p*-phenylenediamine gives brown spherical crystals; *p*-toluylenediamine 1,2,5-diaminoanisol and *p*-aminodiphenylamine do not react. With the second reagent, *p*-phenylenediamine gives long needle-like and branched crystals, rods or plates; *p*-toluylenediamine reacts only in relatively concentrated solution to give needles; 1,2,5-diaminoanisol and *p*-diaminophenylamine do not react.—L. ROSENTHALER. *Mikrochem.*, 21 (1937), 217–218; through *Chimie & Industrie*, 38 (1937), 744. (A. P.-C.)

Phosphides—Metal, Toxicity and Identification of. The toxic properties of zinc phosphide are discussed. It can be detected as follows: Carbonize 5 to 10 Gm. of material with a little sodium carbonate, acidify with hydrochloric acid, filter and evaporate; the solution to be analyzed should be weakly acid or neutral. Mix 1 to 2 drops of the concentrated solution obtained, 1 to 2 drops of cobalt sulfate (0.095 Gm. in 100 cc. of half-normal hydrochloric acid) and 1 to 2 drops of ammonium mercurithiocyanate (8 Gm. mercuric chloride and 9 Gm. ammonium thiocyanate per 100 cc.). If a red color is produced, after about 1 to 2 minutes add a few mg. of alkali fluoride and stir for 15 seconds with a glass rod, rubbing the wall of the vessel. In presence of zinc phosphide a blue precipitate forms.—F. HAUN. *Z. Untersuch. Lebensm.*, 72 (1936), 307–312; through *Chimie & Industry*, 38 (1937), 1085. (A. P.-C.)

Picric Acid—Comparison of the Chief Analytical Methods for Determination of. The aqueous solution is neutralized with aqueous ammonia and picric acid precipitated with cupric sulfate in aqueous ammonia or with mercuric nitrate. None of the standard methods gives exact results for picric acid in effluent water.—N. P. AGAFOSCHIN. *Zavod. Lab.*, 6 (1937), 1016–1018; through *J. Soc. Chem. Ind.*, 57 (1938), 350. (E. G. V.)

Populus Balsamifera—Buds of, Chemical Composition of. The buds of *Populus balsamifera* L., contain asparagine, saccharose, salicoside, cinnamic, propionic, butyric, 4-hydroxybenzoic, 3,4-dihydroxycinnamic and 2,3-dihydroxybenzoic acids. There is also an unidentified phenolic acid melting at 224° C. and a methyltrihydroxyanthraquinone that melts at 218° C. There are no free alcohols except a sesquiterpene alcohol, $C_{15}H_{25}O$ (giving a phenylurethane that melts at 150° C.), but the buds contain the cinnamyl and phenylethyl esters of cinnamic acid and a wax $C_{24}H_{48}O_2$ that melts at 71° C. and gives an amide melting at 117° C. and an anilide melting at 102° C. Acetophenone and the hydrocarbons $C_{25}H_{52}$ and $C_{29}H_{60}$ are also present. 2′,6′-Dihydroxy-4-methoxy-β-phenyl-propiophenone was found and its structure proved by synthesis. This compound is probably the same as that which Kostanecki and Tambo (*Ber.*, 32 (1899), 2448) thought was a flavone.—A. GORIS and H. CANAL. *Bull. soc. chim. France*, 3 (1936), 1982-2009; through *Chimie & Industrie*, 38 (1937), 931. (A. P.-C.)

Potassium Bromide with Caffeine—Effervescent. Potassium bromide is determined by the Volhard method. For the determination of caffeine, 12–15 Gm. of the sample are dissolved in 50 cc. of water, and made alkaline by the addition (if necessary) of sodium hydroxide. The solution is extracted twice with 50-cc. portions of chloroform. The extract is carefully evaporated and dried at 80°, the weight of the residue is reported as anhydrous caffeine. The method has been adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 96; through *Squibb Abstr. Bull.*, 11 (1938), A-476. (F. J. S.)

Potentiometric Titration in Non-aqueous Solutions. Solutions of benzoic, trichloracetic and acetic acids in ethylene glycol monomethyl ether, in the presence of lithium chloride, were titrated with 0.05*N* potassium hydroxide in the ether. Titrations were followed using the quinhydrone electrodes. Sharp end-points were obtained, and the reactions were characterized by steady potentials and rapid assumptions of equilibrium after each addition of reagent. Acetone, anisol or 1,4-dioxane can be used to enhance the solvent powers of butyl alcohol without interfering with the functions of the quinhydrone electrode in this solvent. This extends the possibilities of acidity determination to materials soluble in such solvent mixtures.—A. E. RUEHLE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 130–131. (E. G. V.)

Pregnandiol Glucuronidate—Sodium, Gravimetric Determination of. Evidence is given that sodium pregnandiol glucuronidate (S. P. G.) may be an excretion product of progesterone, and a method is proposed for its estimation. It is extracted from urine by butyl alcohol, the residue after evaporation of the alcohol is taken up in a small quantity of water and the compound is precipitated with acetone. It is then taken up in hot 95% ethyl alcohol and weighed after evapo-

ration of the alcohol. The recovery of the added S. P. G. (20 mg./1 liter of urine) is 85%.—E. H. VENNING. *J. Biol. Chem.*, 119 (1937), 473; through *Physiol. Abstr.*, 22 (1937), 1084. (F. J. S.)

Pyrethrin Content of Pyrethrum Flowers from Various Sources. Analyses are recorded.—D. G. HOYER and M. D. LEONARD. *J. Econ. Entomol.*, 29 (1936), 605; through *J. Soc. Chem. Ind.*, 57 (1938), 103. (E. G. V.)

Pyrethrin I—Determination of. Wilcoxon's method for the determination of pyrethrin I in pyrethrum powder has been modified so that it can be used in the determination of pyrethrin I in insecticides containing pyrethrum powder or extract, mineral oil, essential oils, perfumes, derris resins and other materials. Measure a sample containing from 20 to 75 mg. of pyrethrin I into a 300-cc. Erlenmeyer flask; add 15 cc. of 0.5*N* alcohol sodium hydroxide solution and reflux on a steam-bath or electric hot plate for 1 to 1.5 hours. (More sodium hydroxide may be necessary in samples containing large amounts of perfumes or essential oils.) Transfer to a 600-cc. beaker and add sufficient water to make the aqueous layer to 200 cc. Add a few glass beads, or preferably use a boiling tube, and boil the aqueous layer down to 150 cc. Transfer the aqueous layer to a 250-cc. volumetric flask and add 1 Gm. of Filter-Cel and 10 cc. of a 10% barium chloride solution; make to volume and then let settle (in some cases more barium chloride may be needed to obtain a clear solution). Filter off 200 cc., add 5 cc. of sulfuric acid (1 to 4), filter into a 500-cc. separatory funnel, and extract with two 50-cc. portions of petroleum ether. Wash the extracts with several 10-cc. portions of water and filter through a plug of cotton into a clean 250-cc. separatory funnel. Wash the cotton with 5 cc. of petroleum ether. Extract the petroleum ether with 5 cc. of 0.1*N* sodium hydroxide, shaking vigorously. Draw off the water layer into a 100-cc. beaker, wash the petroleum ether with 5 cc. of water and add this to the beaker. Add 10 cc. of Dènigés (U. S. P. XI) reagent to the beaker and let stand for an hour. Add 20 cc. of acetone and precipitate the reduced mercury with 3 cc. of saturated salt solution. Warm to about 60° C., filter through a small filter paper (7 to 9 cm.), and wash with 10 cc. of hot acetone, transferring all precipitates to the filter paper. Wash with two 10-cc. portions of hot chloroform, and place the filter paper and contents in a 250-cc. glass-stoppered Erlenmeyer flask. Add 30 cc. of concentrated hydrochloric acid and 20 cc. of water to the flask, cool and add 6 cc. of chloroform or carbon tetrachloride and 1 cc. of iodine monochloride solution prepared as follows: Dissolve 10 Gm. of potassium iodide and 6.44 Gm. of potassium iodate in 75 cc. of water; add 75 cc. of hydrochloric acid and 5 cc. of chloroform in a glass-stoppered bottle and adjust to a faint iodine color (chloroform) by adding dilute potassium iodide or potassium iodate solution and titrate with 0.01*M* iodate solution (2.14 Gm. of potassium iodate per liter). Potassium iodate reacts with reduced mercury to form mercuric mercury and iodine. Further addition of iodate in the presence of hydrochloric acid oxidizes the iodine to iodine monochloride. Addition of iodine monochloride does not change the volume relations between reduced mercury and iodate solution and aids in the titration of small amounts of mercury. The end-point is taken when the red color disappears from the chloroform layer. The end-point is not permanent; so the titration should be completed rapidly with vigorous shaking after each addition of iodate. One cubic centimeter of the iodate is equivalent to 4.4 mg. of pyrethrin I.—D. A. HOLADAY. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 5–6. (E. G. V.)

Pyrethrum Flowers—Constituents of. III. Pyrethrin Content of Fresh Flowers. Pyrethrins I and II exist, as such, in flowers. Enzymes and water have no significant influence on the synthesis or decomposition of pyrethrins during the drying of flowers.—F. ACREE, JR., P. S. SCHAFFER and H. L. HALLER. *J. Econ. Entomol.*, 29 (1936), 601; through *J. Soc. Chem. Ind.*, 57 (1938), 103. (E. G. V.)

Pyridium. A sample equivalent to about 0.1 Gm. 2,6-diamino-3-phenylazo-pyridine (pyridium) is dissolved in about 10 cc. 0.1*N* hydrochloric acid and diluted to 100 cc. In the case of ointments, the base is removed before the test is applied. The solution is boiled 2 minutes with 15 Gm. sodium acid tartrate and treated with 10 cc. light green S F yellowish solution (containing 1 Gm. per liter), and titrated hot with standard $TiCl_3$ solution in a current of carbon dioxide. The end-point is the change from green to pale yellow. A blank is run. One cc. 0.1*N* $TiCl_3$ is equivalent to 0.006240 Gm. pyridine derivative. The method was adopted as tentative by the Association.—ANON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 94; through *Squibb Abstr. Bull.*, 11 (1938), A-477. (F. J. S.)

Quantitative Spectrochemical Analysis with the Microphotometer. All methods of spectrochemical analysis involve some form of spectrograph or spectrometer, which is used to detect the presence of certain lines in the spectrum of the specimen being examined, and so to determine the presence of certain elements in this specimen. One of several pieces of apparatus may be used in conjunction with the spectrograph to determine the relative intensities of a pair of spectral lines of a minor element and the major elements, respectively, in order to determine quantitatively the portion of the minor element present in the specimen. The authors review various methods used during the last six years, and describe in some detail a method of using a microphotometer which they consider is likely to be generally adopted for accurate work. The theory of the method is then developed, and finally a detailed description is given of its use in a particular case.—F. TWYMAN, G. F. LOTHIAN and E. S. DREBLOW. *J. Soc. Chem. Ind.*, 57 (1938), 75–79. (E. G. V.)

Rotenone—Determination of, in Derris and Cubé. II. Extraction from the Root. In the analysis of finely powdered samples of derris and cubé roots a method of involving treatment with chloroform at room temperature followed by removal of an aliquot of the filtered extract gives satisfactorily complete extraction of the rotenone. Fineness of the sample is an exceedingly important factor in obtaining complete extraction by this method. If coarse samples are ground so that at least 95% passes a 60-mesh sieve, they will usually give satisfactory extraction by the aliquoting procedure. Samples containing a high ratio of rotenone to total extractives were found to be more difficult to extract than those with lower percentages of rotenone. When the ratio of rotenone to total extract was about 40% or over, particularly in the case of derris roots, it was necessary to employ extraction at room temperature with successive lots of chloroform in order to obtain satisfactory extraction of the rotenone. This method should also be employed as a check whenever there is doubt as to the completeness of extraction by the aliquoting procedure. Cubé roots in general are more readily extracted of their rotenone content than are derris roots. The moisture content of derris and cubé roots as received in this country has not been found to be sufficiently great to interfere with their analysis, and hence preliminary drying of samples seems unnecessary.—ROBERT D'ORAZIO. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 23. (E. G. V.)

Rotenone—Determination of, in Derris and Cubé. III. An Improved Crystallization Method. Rotenone is determined in derris and cubé roots by extraction with chloroform, the extract being then freed of solvent with carbon tetrachloride and crystallized therefrom. In the analyses of 31 samples the results of the two authors checked within 0.4%, with an average difference of 0.2%. Laboratory details. The method was adopted as tentative.—HOWARD A. JONES and J. J. T. GRAHAM. *J. Assoc. Official Agr. Chem.*, 21 (1938), 148; through *Squibb Abstr. Bull.*, 11 (1938), A-436. (F. J. S.)

Selenium—Determination of Combined and Ionic. Application to Natural Waters. *Detection of Selenous Ion.*—Place several particles of the solid sample in a porcelain dish, add a drop of aqueous thiourea solution (5%); mix, then add one drop of hydrochloric acid (1:10). A red precipitate of selenium should appear immediately. Under the same conditions Se^{6+} yields a precipitate only after several minutes. When the sample is a liquid containing more than 0.25 Gm. of selenium per liter use 5 cc. and add 5 drops of hydrochloric acid and 5 drops of 5% thiourea solution. With lower concentrations, the amounts of reagents remaining the same, the rapidity of the reaction depends upon the concentration of selenium. Heating will hasten the reaction. *Commercial Sulfuric Acid and Hydrochloric Acid.*—To 5 cc. of the diluted sample (1:10 or 1:20) add 5 drops of thiourea solution, mix, bring to a boil and then allow to cool. A turbidity indicates selenium. *Natural Waters.*—Evaporate a 60-cc. sample to about 4 cc., add 5 drops of hydrochloric acid. Transfer the residue to a small graduated cylinder and make up to 6 cc. with the wash water. Mix and filter. To 5 cc. of the clear filtrate add 2 drops of hydrochloric acid and 5 drops of thiourea solution. Boil, allow to cool for 5 minutes, then examine. A turbidity is produced with 0.05 mg. selenium per liter. If the water contains sodium bicarbonate, make just acid with hydrochloric acid.—GEORGES DÈNIGÈS. *Bull. soc. pharm. Bordeaux*, 75 (1937), 197–205. (S. W. G.)

Silicates—Analyses of. Six amphiboles were analyzed by two to four chemists; in each case the analyses failed to agree by as much as 1.5% on one or more constituents. The lack of agreement was not confined to a few oxides, but present in every major constituent, including TiO_2. This failure to check may be partly due to the presence of fluorine (up to 2.18%).—ESPER S. LARSEN. *Am. J. Sci.*, 35 (1938), 94. (G. F. W.)

Silver—Determination of, in Colloidal Silver Ointments. S. found that destruction of fatty material by calcination as described in the Estonian and Swiss Pharmacopœias was too tedious. Addition of 20 Gm. dilute (1:1) nitric acid to 1 Gm. ointment and heating for 30 minutes on the water-bath gave results more rapidly. Then 20 cc. water were added and the mixture was heated for 5 minutes until the fat separated. After thorough cooling the liquid was filtered through cotton and the fatty layer washed with small amounts of water, the washings were filtered and added to the rest to make 100 cc. To oxidize any nitrous acid formed during the process and to prevent it from reacting later with the thiocyanate, 0.1*N* $KMnO_4$ was added, drop by drop, to a slight excess, and the pink coloring decolorized by adding a few crystals of ferrous sulfate. Then 5 cc. of ferric ammonium sulfate were added and the solution was titrated with 0.1*N* ammonium thiocyanate. The colloidal silver dissolves as nitrate; any silver chloride present (up to 3%) does not interfere with the titration. The amounts detected by this method agree closely with those obtained gravimetrically and by the Pharmacopœial method.—AUGUST SIIM. *Pharmacia*, 17 (1937), 251; through *Squibb Abstr. Bull.*, 11 (1938), A-198. (F. J. S.)

Soap—Determination of Fatty and Other Organic Acids, Unsaponified Fat, and Unsaponifiable Material in. The calorific value of the soap under analysis is compared with that of sodium oleate, and the content of organic material is calculated therefrom as oleic acid. The differences between the organic acid content as determined by this and the standard method vary by from 0.9 to 0.21% for a number of soaps.—V. G. RAVITSCH. *Zavod. Lab.*, 6 (1937), 822–823; through *J. Soc. Chem. Ind.*, 57 (1938), 404. (E. G. V.)

Sodium Cyanide—Excretion of, When Administered Intravenously in Small Doses. The method of administering sodium cyanide experimentally is given. Cyanide excreted in the urine was distilled as hydrocyanic acid into sodium hydroxide. The author favors the benzidine-copper method of determining cyanide in the distillate. He summarizes his results as follows: "Cyanide given intravenously is rapidly excreted in the urine and breath, the major part apparently coming through the lungs. The amount in the urine is affected by the use of diuretics."—G. V. JAMES. *Analyst*, 63 (1938), 99. (G. L. W.)

Sodium Salicylate or Benzoate in the Presence of Sodium Bicarbonate—Potentiometric Determination of, in the Same Differentiating Solvent. A sharp end-point is obtained when sodium salicylate or benzoate in 90% acetone is titrated with standard hydrochloric acid. Sodium bicarbonate also present can be similarly titrated in 45% acetone preferably using the Pinkhoff procedure.—N. A. IZMAILOV and A. G. SCHVARTZMAN. *Ukrain. Chem. J.*, 12 (1937), 375–384; through *J. Soc. Chem. Ind.*, 57 (1938), 136. (E. G. V.)

Spectrochemical Analysis—Quantitative. The quantitative spectrochemical method has proved its worth as an analytical tool in the chemical industries. Important advantages of the method include economy of time and material, fitness for analysis of materials for elements present in extremely small concentrations. As illustrations of the several thousand quantitative determinations made each month, the analyses of plastics and pharmaceuticals are briefly described. The economy of the method is shown by the fact that average time required for one determination, taking into account the analyses of all the chemical and metallurgical materials required by chemical methods is at least four times as great. The concentrations of the elements under analysis vary from 0.0001% to several %. The development of special equipment and technic, important for the attainment of greater sensitivity, accuracy and rapidity of analyses in routine industrial use, is outlined.—J. S. OWENS. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 64–67. (E. G. V.)

Spectrographic Analysis—Quantitative. Treatment of Graphite Electrode for Evaporation of Aqueous Solutions. A solution for testing the penetration was made by dissolving 200 Gm. of $Ca(NO_3)_2.4H_2O$ in sufficient 25% nitric acid to make 1 liter of solution. The electrodes used in the tests were 1.56-cm. lengths of 0.78-cm. rounds of spectrographic graphite. A conical-shaped cup was drilled in one end of each of the electrodes. The electrodes were heated to about 1500° C., cooled, treated with materials for reducing the penetration, and then placed in holes in a copper block. The temperature of this block was maintained at a few degrees above 100° C. during the dropwise evaporation of 0.5 cc. of the test solution on each electrode. Following evaporations, which required about 30 minutes, the dried calcium nitrate residues were scraped from the cups. Each electrode was then sawed in two lengthwise and the halves were heated to a high temperature with an oxygen-gas flame. This process formed calcium oxide in the regions where the depositions of calcium nitrate had been made. Of the materials tried, paraffin and heavy

mineral oil were found to be most effective in reducing the penetration of the solution, resisting change by chemical action, and facilitating the vaporization process.—H. A. WILHELM. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 211–212. (E. G. V.)

Strong and Weak Acids, Buffer and Neutral Salts—Quantitative Analysis of Mixtures of. Mathematical formulæ are deduced for determining the amounts of weak acids and the mobility of their anions, small proportions of strong acids and buffer salts, and the approximate amounts of the neutral salts and the ionization constituents of the weak acids in mixtures, from conductometric titrations with sodium hydroxide and hydrochloric acid.—I. W. F. BARKER, E. H. ROHWER and S. G. SHUTTLEWORTH. *J. Soc. Leather Trades Chem.*, 22 (1938), 2–19; through *J. Soc. Chem. Ind.*, 57 (1938), 416. (E. G. V.)

Sulfur—Determination of, in Oil. Tetrahydroxyquinone as an Aid in Direct Titration. Take a sample of oil weighing from 0.6 to 0.8 Gm. and burn in an oxygen bomb. Treat the sample thus obtained with bromine water in the conventional manner. Evaporate sufficient water to bring the total volume of the sample below 100 cc., cool and make up in a volumetric flask to 100 cc. Transfer 25 cc. of sample by pipette to a 125-cc. Erlenmeyer flask, add a few drops of phenolphthalein indicator and neutralize just to the alkaline side of the phenolphthalein end-point with approximately 0.02*N* potassium hydroxide. Discharge the red coloration with approximately 0.02*N* hydrochloric acid. Add 25 cc. of alcohol and 1 dipper of indicator (0.15 Gm.). Titrate the sample with standard barium chloride solution until the solution changes sharply from yellow to red that is permanent with strong shaking. Shake the flask through the titration to establish equilibrium conditions. From the total volume of barium chloride required, 0.1 cc. should be subtracted from a blank. The amount of sulfur present in the original sample may then be calculated.—R. T. SHEEN and H. L. KAHLER. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 206–207. (E. G. V.)

Sulfuric Acid—Simple Method for the Estimation of, in Urine. A method is described for the determination of sulfuric acid in urine by measurement of the volume of barium sulfate precipitated. The method was tested on the urine of schizophrenic patients undergoing insulin shock therapy.—CARL RIEBELING. *Z. physiol. Chem.*, 251 (1938), 41; through *Squibb Abstr. Bull.*, 11 (1938), A–294. (F. J. S.)

Taxin—Detection and Determination of the Alkaloid, in Preparations of Taxus Baccata. *A. Qualitative Test for Taxin in Taxus Preparations.*—After the addition of 10 cc. water and a few drops of dilute sulfuric acid, free 5–10 Gm. of the preparation from alcohol by warming on a water-bath and filter the residue into a separatory funnel, make alkaline and extract with ether. Evaporate the ether solution to dryness. The residue gives the following reactions: (1) by treating with concentrated sulfuric acid, a deep red-violet color results, (2) with concentrated sulfuric acid-potassium dichromate, a purple-blue color, (3) with concentrated hydrochloric acid, a weak violet color, (4) with concentrated sulfuric acid-phosphomolybdic acid, a green color. Dilute acid solutions of the residue yield precipitates with the usual alkaloidal reagents. *B. Quantitative Determination.*—Treat 5 Gm. of coarsely powdered drug with 200 cc. ether and shake well, add 2 cc. sodium hydroxide solution and set aside for about 3 hours with frequent vigorous shaking; filter the ether solution through cotton, add 1 Gm. talc, shake 2 minutes, add 2 cc. water, shake again and filter the solution through a well-covered filter. Evaporate 160 cc. of the clear filtrate (= 4 Gm. drug) on a water-bath to about 30 cc., transfer to a separatory funnel rinsing the flask and filter with 2 × 10 cc. ether; extract the ether solution with 3 × 20 cc. sulfuric acid (1%). Extract the united aqueous extracts with 2 × 50 cc. ether, make slightly alkaline and then extract with 3 × 25 cc. ether. Shake this ether solution with 50 cc. water and then filter into a tared flask, evaporate and dry to constant weight and weigh. *C. Preparation of Taxin from Fresh Yew Needles.*—Treat 100 Gm. of freshly powdered needles with 2.5 liters of ether and 30 cc. ammonia and allow to stand for 12 hours with vigorous shaking, decant the ether solution and shake with 500 cc. 1–2 hours, filter the combined ether solution through cotton and evaporate the major part of the ether on a water-bath. Add the residue to a separatory funnel and extract 3 times with 1% sulfuric acid; purify the acid-aqueous solution by shaking several times with ether, then make alkaline and extract the taxin by shaking twice with ether, which after washing with water is evaporated to a small volume and precipitate the taxin by the addition of petroleum ether. Dissolve the crude product in dilute sulfuric acid to purify and precipitate by the addition of an excess ammonia; dissolve the precipitate in ether and filter through animal charcoal and stir

vigorously, allow to stand in the refrigerator over night, filter and evaporate off the ether. Dissolve the residue in 1% sulfuric acid and again precipitate the taxin with ammonia (m. p. 113–114° C.). Experiments showed that the taxin can also be determined in the residues from the purified ether extracts of the drug and the tincture by dissolving in 2–3 cc. alcohol, add 5 cc. 0.1*N* hydrochloric acid and titrate the excess acid with 0.1*N* sodium hydroxide using methyl red as an indicator (1 cc. 0.1*N* hydrochloric acid = 0.0669 Gm. taxin). *D. Alkaloidal Determination in Taxus Baccata Mother Tinctures.*—Evaporate 50 Gm. on a water-bath to 10 cc., rinse with 1% sulfuric acid into a separatory funnel and then rinse the dish; extract the liquid twice with ether being careful to prevent the formation of an emulsion. Make alkaline with ammonia and extract with 3 × 20 cc. ether; shake the ether extract twice with water to purify, filter into a flask, evaporate the ether and dissolve the dry residue in 2 cc. alcohol, add 5 cc. 0.01*N* hydrochloric acid and 5 cc. water and titrate the excess acid as above using methyl red as an indicator. Experiments also show that the alkaloidal content varies considerably during the year reaching a maximum in the winter; the alkaloid is shown to be a violent cardiac poison.—A. KUHN and G. SCHÄFER. *Apoth. Ztg.*, 52 (1937), 1265–1267. (H. M. B.)

Tellurium—Microchemical Identification of. 1. To several fine particles of the metalloid on a slide (<1 mg.) add 2 droplets of bromine solution (1 volume bromine + 4 volumes chloroform). Allow to evaporate (about 2 minutes). The citron yellow residue has the alliaceous odor of tellurium tetrabromide. To the dry residue (if moist, pass through a Bunsen flame 2–3 times) add 1 drop of a mixture of chloroform 2 volumes and alcohol (at least 95%) 1 volume, allow to evaporate at 35–40° and observe under a magnification of 130–150. 2. To the closely grouped particles of the metalloid add 3 or 4 drops of a solution containing 10 Gm. of iodine in 100 cc. of alcohol. After 2 minutes pass through a Bunsen flame several times to remove excess iodine. Allow to cool and examine under a magnification of 130–300. Small black crystals of tellurium tetraiodide, insoluble in carbon tetrachloride, are observed. The tellurium tetraiodide may be recrystallized from acetone.—GEORGES DÈNIGÉS. *Bull. soc. pharm. Bordeaux*, 75 (1937), 206–210. (S. W. G.)

Tetraiodophenolphthalein—Determination of Iodine in. A critical review of known analytical methods. The U. S. P., International, Carius and Baubigny-Chavanne procedures gave good results.—L. LECLERCQ and A. CLOSSET. *J. pharm. Belg.*, 20 (1938), 233–236, 253–257. (S. W. G.)

Thallium—New Method for Detecting. The method is based on the oxidation of monovalent thallium in alkaline solution with potassium ferricyanide to thallic hydroxide which with tetraethyldiamine-*o*-nitrophenylmethane (leuco compound of *o*-nitrobrilliant green) in acetic acid gives an intense blue-green and depends on the solubility of thallous hydroxide and insolubility of thallic hydroxide. To 0.2 to 0.3 cc. of a solution containing thallium and any other cations add 0.5 cc. of half-normal potassium hydroxide, filter and to the filtrate add 2 to 3 drops of a saturated potassium ferricyanide solution, filter off the thallic hydroxide, wash it on the filter two or three times with water, and place one drop of the reagent on the precipitate. The determination is not affected by other cations; the reaction is sensitive to 0.09γ at a maximum dilution of 1:550,000.—L. KUHLBERG. *Mikrochemie*, 19 (1936), 183–186; through *Chimie & Industrie*, 38 (1937), 444. (A. P.-C.)

Thiourea—Identification Reactions for. The following tests for identity of thiourea are given. *Desulfuration.*—Heat until fumes of sulfur are given off. Condense the fumes on a slide and crystallize from carbon disulfide or benzene. Add a little iron perchlorate to an aqueous solution of thiourea. A yellow color is produced and on boiling until the color is gone colloidal sulfur is formed. Heat a mixture of a few particles of thiourea with 1–2 drops of sodium hydroxide solution just to boiling, add 2 cc. of water and 1–2 drops of sodium nitroprusside. A purple color is formed. Alkaline silver nitrate, sodium plumbite or Nessler's reagent give black precipitates of metallic sulfides with thiourea. *Reduction.*—Thiourea in aqueous solution will reduce sodium selenite solution giving a red precipitate of selenium. *Microcrystallization.*—Crystals are obtainable from acetone, alcohol, acetic acid and water. One drop of 5% mercuric cyanide added to a solution of thiourea gives a definitely crystalline precipitate.—G. DÈNIGÉS. *Bull. soc. pharm. Bordeaux*, 76 (1938), 5–12. (S. W. G.)

Thiourea—Use of, as Reagent for Cadmium Ion. A yellow precipitate of cadmium sulfide forms on boiling 5 cc. of the sample, to which ammonia water has been added to form the

ammonia complex, with 0.5–1.0 cc. of 5% thiourea solution.—GEORGES DENIGES. *Bull. soc. pharm. Bordeaux*, 76 (1938), 13. (S. W. G.)

Universal Indicator for Determining p_H in the Range 1.2 to 12.7 in Volumetric Analysis. A mixture of indicators is prepared containing in 1 liter of ethanol: sym-trinitrobenzene 1.1250 Gm., phenolphthalein 0.0355 Gm., *o*-cresolphthalein 0.0300 Gm., dibromothymolsulfonephthalein 0.100 Gm., methyl red 0.220 Gm., methyl orange 0.0085 Gm. and pentamethoxyl red 0.0500 Gm. Change of color takes place in the p_H ranges 14.0–12.0, 10.0–8.3, 9.8–8.2, 7.6–6.0, 6.3–4.2, 4.4–3.1 and 3.2–1.2, respectively. In 95% ethanol and in aqueous solution the pentamethoxyl red and the bromothymol blue interacted and precipitated as smudge. In anhydrous ethanol or in methanol the universal indicator was stable. Since most of the indicators are more soluble in methanol than in ethanol, methanol solution is preferable to ethanol. Neither commercial methanol nor acetone was satisfactory as a solvent.—F. CUTA and K. KAMEN. *Coll. Trav. Chim. Tchécoslovaquie*, 8 (1936), 395–407; through *Chimie & Industrie*, 38 (1937), 1076. (A. P.-C.)

Unsaturation in Organic Compounds—Determination of. A calculated excess (10 to 15%) of 0.1*N* bromate-bromide solution (about 25 cc.) is run from a burette into a 300-cc. conical flask having a ground-glass stopper bearing a sealed-in stop-cock. (The first analysis of the solution is approximate only, and should be carried out with a larger excess of bromate-bromide solution. From this preliminary result the desired excess can be calculated.) Following evacuation of the flask by means of a water aspirator, 5 cc. of 6*N* sulfuric acid are added and the flask is allowed to stand 2 to 3 minutes while bromine is being liberated. Next, 10 to 20 cc. of 0.2*N* mercuric sulfate and the solution to be analyzed, which should have about two milliequivalents of unsaturation, are run in. The volume of the carbon tetrachloride wash liquid should be about 15 cc. Following this, 20 cc. of glacial acetic acid are added. In the case of water-soluble substances, the acetic acid is omitted. After the flask, wrapped in a black cloth, has been shaken for about 7 minutes, 15 cc. of 2*N* sodium chloride and 15 cc. of 20% potassium iodide are added in succession, and the shaking is continued for 0.5 minute. The vacuum is broken and the titration made with 0.05*N* sodium thiosulfate, using starch. A blank, without the sample and with one-third of the amount bromate-bromide solution used in the analysis, is run at the same time, and under the same conditions. The excess of bromate-bromide should not exceed 10 to 15%; otherwise errors due to substitution may become appreciable. If the excess is less, the rate of addition may become so slow toward the last that the reaction is not quantitative in the time specified.—H. J. LUCAS and D. PRESSMAN. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 140–142. (E. G. V.)

Uric Acid—Microcrystalline Identification of. The sample may be (A) completely dissolved in normal sodium hydroxide solution, or (B) mixed with a droplet of sulfuric acid on a glass slide. (A): Precipitate the acid by adding and quickly mixing one-tenth its volume of sulfuric acid; the precipitate is amorphous but becomes crystalline in about 1 minute. (B): Gently warm the mixture until clear and cool, add a drop of water, let stand for several minutes, then carefully wash with a fine stream of water. The crystals will adhere to the slide and should be examined without drying and without a cover glass. Uric acid will reduce a solution prepared by adding 3 to 4 drops of sodium hydroxide solution to 3 cc. of 2 to 3% silver nitrate and then ammonium hydroxide until clear.—G. DÈNIGÉS. *Bull. trav. soc. pharm. Bordeaux*, 75 (1937), 73–78; through *Chimie & Industrie*, 39 (1938), 55. (A. P.-C.)

Volatile Oil in Marjoram. A table is presented showing the amount, specific gravity, optical rotation, refractive index, acid number and ester numbers of 19 samples of volatile oil from marjoram leaves.—J. F. CLEVENGER. *J. Official Agr. Chem.*, 21 (1938), 109; through *Squibb Abstr. Bull.*, 11 (1938), A-436. (F. J. S.)

Waters—Standardization of the Determination of Organic Matter in Potable and Residuary. The potassium permanganate procedure is modified using *N*/100 permanganate for the analysis of potable waters and *N*/10 permanganate for residuary waters. Flocculation with aluminum hydroxide removes the insoluble organic matter without altering the soluble organic matter content appreciably. The water may be preserved by adding 2 Gm. of sodium fluoride per liter.—ALB.-J.-J. VANDE VELDE. *J. pharm. Belg.*, 19 (1937), 919–923, 937–941. (S. W. G.)

Wines—Complete Balance Sheet and Distribution of Ionizable Substances Contained in. Complete analyses of wines are given and the ratios of free to combined organic acids calculated.—E. BREMOND. *Bull. soc. chim.* [V], 4 (1937), 296–305; through *J. Soc. Chem. Ind.*, 56 (1937), 384. (E. G. V.)

Wines—Large Scale Clarification of. Use of bentonite is examined; its action is improved by heating wine to 49–60°. Removal of iron is increased by pretreatment with activated carbon (0.25–2 pounds per 1000 gallons) and aeration followed by bentonite.—L. G. SAYWELL. *Wines and Vines*, 16 (1935), 10–11; through *J. Soc. Chem. Ind.*, 56 (1937), B., 383. (E. G. V.)

Zinc—Detection of, with Potassium Ferricyanide and *p*-Phenetidine. Under favorable conditions 0.05γ of zinc can be detected by the following spot-plate test. Mix on the spot-plate 6 drops of freshly prepared 2% potassium ferricyanide solution with 2 drops of normal sulfuric acid and 12 drops of 1% *p*-phenetidine hydrochloride solution. From the resulting brownish yellow reaction mixture, transfer 0.1 cc. to another cavity in the white spot plate and add carefully about 0.01 cc. of the solution to be tested; at the contact zone a blue precipitate or coloration will result. The test depends on the formation of a precipitate of zinc potassium ferrocyanide from the trace of ferrocyanide present in the ferricyanide reagent. This removal of ferrocyanide increases the oxidizing power of the ferricyanide which then oxidizes the organic compound and the colored oxidation product is adsorbed by the precipitate. The test succeeds in the presence of ammonium, potassium, sodium, magnesium, calcium, strontium and barium. If mercury, arsenic, antimony, aluminum, cadmium, manganese and chromium are present it is necessary to compare the result with blank tests run on solutions containing the foreign ions. In the presence of silver, lead, bismuth and tin it is possible to overcome interference by precipitating the interfering ions, but the test fails completely in the presence of iron, cobalt, nickel and copper.—L. SZEBELLEDY and ST. TANAY. *Z. Anal. Chem.*, 106 (1936), 342–348; through *Chimie & Industrie*, 38 (1937), 661. (A. P.-C.)

PHARMACOGNOSY

VEGETABLE DRUGS

Cinchona Bark. A review of the history of cinchona and its active alkaloidal constituents. A. LENDLE. *Pharm. Ztg.*, 82 (1937), 879–881. (N. L.)

Cinnamon—Ceylon, Commercial History and Preparation of. The authors list exports from Ceylon of cinnamon quills and chips, dating from 1903 through 1937. Cultivation of this drug, manner of cutting the shoots, and other details are given concerning the cinnamon industry. The various grades of cinnamon may be grouped into quills, quillings, featherings and chips.—G. E. TREASE and C. X. PINTO. *Pharm. J.*, 140 (1938), 319. (W. B. B.)

Derris Root—Harvesting, Drying and Sampling. It is proposed to divide the roots into thick and thin categories when harvesting, to dry each kind separately at about 50°, and to bale proportionate amounts in each bale. Twenty-five samples from 497 bales thus prepared from one estate had 21.14–27.33% of total extractives, including 5.62–8.85% of rotenone, the % of rotenone in the extract varying from 26.2 to 35.4%.—C. D. V. GEORGI. *Malayan Agri. J.*, 25 (1937), 425; through *J. Soc. Chem. Ind.*, 57 (1938), 92. (E. G. V.)

Dwarf Pine Oil. I. Quantity and Distribution in the Plant and Its Extraction. *Oleum Pini Pumilionis* is extracted in the Tyrol region from the crooked shaped wood varieties of *Pinus montana* Mill., the so-called "knee" or "scotch" pine. The needles contain less oil than the stems on which they grow. The stems with increasing age exhibit a diminution in volatile oil content—in one experiment from 0.74% for the youngest to 0.05% for a twenty-year old sprout. In all cases the percentage of oil from the bark amounted to ten times that from the wood. The diminution of volatile oil content with the advancing age of the stems is on the one hand restricted by a corresponding decrease for the bark and wood in the same direction, but on the other hand by the fact that with increasing age the weight proportion is displaced in favor of the woods poorer in oil. Determinations carried out monthly for more than a year of the volatile oil content of the twigs of one and the same tree yielded a maximum in the winter (0.61% in January) and a minimum in the summer (0.32% in August). Fifteen to thirty old boughs together with their needles were steam or water distilled for the technical extraction of the oil. The yield fluctuated between 0.12 and 0.45%. The share contributed by the needles to the total yield of oil amounted to about one-third. The reference by the U. S. P. to *Oleum Pini Pumilionis* as the oil from the needles only should not necessarily be approved.—LUDWIG KOFLER. *Arch. Pharm.*, 275 (1937), 621. (L. L. M.)

Evodia Fruits—Anatomical Examination of. Fructus Evodiæ is derived from **Evodia rutaecarpa,** Hook fil. et Thoms, which is cultivated in Japan. For investigation the authors col-

lected their own material. Contrary to F. Ebert's statements no tannin could be detected by the vanillin-hydrochloric acid reagent. Nor were stone cells found in the vicinity of the secretory glands. Lignification of subepidermal cells of both sides of the pericarp was observed only in material collected in October or later. In addition, large mucilage cells were observed in the ground tissue of the fruit and hesperidin-like sphero-crystals were observed in the walls of the pericarp. The German abstract contains a key to the figures in the Japanese text, which includes drawings also for **E. Danielli**, Hemsl and **E. Nishimuræ**, Koidz.—H. FUJITA and T. MAEKANA. *J. Pharm. Soc. Japan*, 55 (1935), 189–191. (R. E. K.)

Gogo. Gogo, the stem and branches of *Entada phaseoloides* (L.) Merr., grows wild and is cultivated in Philippines. Used by natives as detergent and suggested as ingredients of shampoos.—ANON. *Am. Perfumer*, 36 (1938), 49. (G. W. F.)

Guarana of Brazil. Its Industrial and Medicinal Value. A description of the plant, its culture and preparation for commercial purposes are given. Fluidextracts, tinctures, syrups, pastilles having a guarana base and wines, notably guarana champagne are its forms. It is encountered principally in the lower Amazon region, as well as in the Orinoco river valley.—José WATZEL. *Bol. ministerio agr.* (Brazil), 26 (1937), 25–32; through *Chem. Abstr.*, 32 (1938), 2292. (F. J. S.)

Jequiriti. Pharmacognostic Study of a Common Brazilian Plant. Green or purplish green in color; has leaves composed of paired oval leaflets. Pink flowers, several on stalk, develop into pods containing 5 or 6 seeds, which are bright red, with black spot at one end. Seeds used in Brazilian Pharmacopœia for treatment of conjunctivitis and trachoma. Description is given with cuts of histological structure of leaves, roots and stems. Used since 1867 for opthalmia, it is considered miraculous, or useless or even harmful. Commonly used as 3 to 5% macerate for local application. Chemical analysis yields albuminous substance, small amount of glucoside susceptible of fermentation. Insoluble in alcohol and salt solutions. Other experimental uses, a bactericide of doubtful value. However, it proved useful in conjunctivitis and trachoma.—NARCISO SOARES DA CUNHA. *Tribuna farm.*, 5 (1937), 109. (G. S. G.)

Kigelia Æthiopica, Decne—Pharmacognosy of. The seeds (120 Gm.) yield an oil (10 Gm.) density 0.964, acid value 1.23, saponification value 154.6 and contain arabinose. The fruit does not contain tannin.—C. MASINO. *Boll. chim.-farm.*, 76 (1937), 525; through *J. Soc. Chem. Ind.*, 57 (1938), 104. (E. G. V.)

Medicinal Plants—Chemical Differences between the Constituents of Fresh and Stored. Some plant drugs (ergot, aspidium, valerian, squill, digitalis and belladonna leaves) are therapeutically more useful in their fresh state, while others (buckthorn rind, vanilla pods, caraway seed, etc.) are more valuable after fermentation or oxidation products have been formed during storage. Twenty-two references.—W. POETHKE. *Chem.-Ztg.*, 61 (1937), 949–951 (in German); through *Chem. Abstr.*, 32 (1938), 2289. (F. J. S.)

Ononis—Contribution to the Differentiation of the Roots of Various Species of. The official botanical source of *Radix Ononis* D. A. B. Vi is *Ononis spinosa* L. (Family *Papilionaceæ*), but it is often adulterated with other species of Ononis. No specific reactions for identification have been developed. Saponins are absent. Microsublimation of the following affords a colorless crystalline sublimate which turns an intense violet color when dabbed with alcoholic vanillin and sulfuric acid: *Ononis alopecuroides* L., *Ononis antiquorum* L., *Ononis Columnæ* All., *Ononis hircina* Jacq. (*O. arvensis* L.), *Ononis mitissima* L., *Ononis procurrens* Wallr. (*O. repens* L.) and *Ononis spinosa* L. An amorphous incrustation which did not give a color reaction with the above reagents was obtained from the following: *Ononis biflora* Desf., *Ononis laxiflora* Desf., *Ononis Natrix* L., *Ononis ornithopodioides* L., *Ononis pubescens* L., *Ononis reclinata* L. and *Ononis rotundifolia* L. A tabulation by which these may be further differentiated microscopically by the variation in trachea and tracheids, wood fibers and parenchyma, cambium, etc., is given. Three photomicrographs are included.—R. JARETZKY and F. NEUWALD. *Arch. Pharm.*, 275 (1937), 662. (L. L. M.)

Pepper—Investigation of. A review of procedures with tabulated results giving mineral matter, acid-insoluble matter, constituents and observations.—L. HOTON. *J. pharm. Belg.*, 20 (1938), 4–7. (S. W. G.)

Pepper—Study of. Chemical constituents and reactions as means of classification are reported.—L. HOTON. *J. pharm. Belg.*, 19 (1937), 854–859, 873–877. (S. W. G.)

Podophyllum—Histology of Indian. The histological details of the rhizome and roots of *Podophyllum emodi* Wall. are given along with illustrations. Powdered Indian podophyllum presents the following characters: (1) The complete absence of epidermal cells with brown contents. (2) The presence of cluster crystals of calcium oxalate, which are comparatively few in number and do not exceed 60 microns in diameter. (3) The almost complete absence of pericyclic fibers. (4) The presence of much starch, individual granules not exceeding 35 microns in diameter. (5) A fairly large amount of thin-walled, isodiametric cork cells. (6) Sclerenchymatous cells, which are irregular or somewhat contorted in form, are more abundant than in the American podophyllum. All these characters excepting No. 4 are useful in distinguishing the Indian from the American drug.—T. E. WALLIS and S. GOLDBERG. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 311–318. (S. W. G.)

Pyrethrum in Kenya. A general article dealing with history, cultivation, harvesting, yield, drying and preparation and commercial organization.—V. A. BECKLEY. *Bull. Imp. Inst.*, 36 (1938), 31–44. (A. P.-C.)

Quinine Supplies in India.—A. J. H. RUSSELL. *Records, Malaria Survey India*, 7 (1937), 253; through *Chem. Abstr.*, 32 (1938), 2689. (F. J. S.)

Rhubarb—Adsorption Fluorescence Reaction of Various Species of. Twenty different samples of rhubarb were examined by the adsorption fluorescence test and also by the borax fluorescence test. The results are given in a concise tabular form.—S. K. CREWS. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 368. (S. W. G.)

Turmeric—Microscopical Identification of, in Rhubarb Powder. In a large drop of glycerin of boric acid (1:3) introduce a little of the powder under examination, separate the particles with dissecting needles, heat gently over a flame and examine under a small magnification. In pure powdered rhubarb the particles are surrounded by lemon-yellow diffusion zones; when turmeric is present, besides these yellow diffusion zones there are dark orange-brown diffusion zones produced chiefly by the particles of turmeric rich in oleoresins.—R. SOUÈGES. *Bull. sci. pharmacol.*, 43 (1936), 511–513; through *Chimie & Industrie*, 38 (1937), 1138. (A. P.-C.)

PHARMACY

GALENICAL

Aconitum Napellus—Change in Toxicity of Some Galenical Preparations of, upon Storage. The toxicity of the dry extract toward guinea pigs decreased in 1 year by only 2 minimum lethal dose units (from 10 to 12). A solution in 70% alcohol lost toxicity rapidly (from 10 to 28 units), reaching the admissible limit of 15 in 4 months. A tincture (1 in 10) of the dry extract in 25% alcohol showed decrease of toxicity from 10 to 15 units in 1 year; and the p_H value passed from 2.5 to 5.0. When the 25% alcoholic tincture was stabilized by addition of hydrochloric acid or of acetic acid so as to adjust the p_H to an optimum value of 2.3 to 3, the toxicity gradually decreased in 1 year from 10 to 14 units. The tincture or the dry extract should not be kept for more than 1 year without physiological retesting.—R. FREUDWEILER. *Pharm. Acta Helv.*, 11 (1936), 193–201; through *Chimie & Industry*, 38 (1937), 1138. (A. P.-C.)

Belladonna Extracts—Ability of, for Taking up Moisture. Several extracts of the Swiss Pharmacopœia rapidly absorb moisture on exposure to air and must be kept over calcium chloride in order that they remain dry. The author has studied the rate of absorption of water by the pharmacopœial extract of belladonna and by a sample offered for sale by the Lüdy Co. of Burgdorf. Starting with extracts dried over sulfuric acid, the extract of Lüdy at the end of 10 minutes had taken up the maximum amount of water (about 0.25%) while at the end of 1 hour the pharmacopœial sample was still absorbing moisture. Over a period of 20 hours, the amounts of moisture taken up were 0.6% and 6%, respectively. Extract of belladonna as prepared by Lüdy is therefore an acceptable extract and comes close to the ideal in lack of hygroscopicity.—K. SEILER. *Schweiz. Apoth.-Ztg.*, 76 (1938), 265. (M. F. W. D.)

Cascara Sagrada—Extract of. *2,110,205.*—Preliminary to the preparation of a liquid extract, the bark is debitterized by treating with water and fermenting (suitably with yeast at 35° to 40° C.). *2,110,206.*—A debitterized extract is obtained by preparing an aqueous percolate and treating the bark with an alkaline-earth hydroxide in the presence of water, and subsequently oxidizing the extractive, as by aeration for several hours.—EDWARD D. DAVY. U. S. pats. 21,110,205 and 2,110,206, March 8, 1938. (A. P.-C.)

Chloretone Preparations—Stability of. Among typical preparations containing chloretone are powders for sea sickness, for example: caffeine 0.05 Gm., chloretone 0.30 Gm. and phenacetin 0.30 Gm., and also suppositories of chloretone and cocoa butter. Studies of the keeping qualities of such preparations in various containers with various closures are reported by the technical division of the Swedish Royal Pharmaceutical Institute. Chloretone is very volatile from powder papers. Powders in papers standing 8 days at room temperature, not in a container, were wholly free of chloretone. Suppositories kept in a paper box at room temperature lost strength from an initial 5.9% chloretone to 4.0% in 10 days, 1.2% in 45 days and 0.2% in 100 days. Chloretone preparations must be enclosed in well-stoppered glass containers such as glass jars with tight locking cap.—O. ÅHMAN. *Farm. Revy*, 37 (1938), 359. (C. S. L.)

Chlorinated Lime—Stability of. For best results, chlorinated lime must be stored in a cool dry place in well-closed containers preferably away from metal containers which are corroded by the escaping chlorine. Once the lime has become moist it can no longer be used. Three types of sealing were tried, using in all cases gray porcelain jars. In the first several layers permanganate paper and a strip of paraffin paper were placed between the lid and the jar, the edge being sealed with one thickness of tape. Over a period of 20 months, it lost 16.6% of its chlorine content. Another sample was stored in a jar, the edge of which was sealed with a double strip of tape and a single layer of Kopallak. This sample lost 4% of its chlorine content over a period of 15 months. A third sample, sealed like the first, except that paraffin paper was substituted for the permanganate paper, showed no loss of chlorine after $7^1/_2$ months' storage.—J. THOMANN. *Schweiz. Apoth.-Ztg.*, 76 (1938), 241. (M. F. W. D.)

Drug Extraction. XV. A Study of Fractional Percolation. The historical background is sketched. Experimental work is carefully reported and covers preparation of fluidextract of belladonna root by percolation and by fractional percolation. Dimensions of percolators, volume of packed drug, length of drug column are all given. Total alkaloids in various fractions and total extractive also are given. Likewise N. F. methods were studied. Discussion of results covers method of packing, comparison of simple percolation and fractional percolation, especially the effect of proportion of moistening liquid and proportion of weak percolate collected in fractional percolation. It was found that the proportion of alkaloid is about the same by either method but simple percolation yields much more extractive. Fractional percolation takes less time of operator but total elasped time is more. Packing from top saves time, packing in sections leaves less solvent in marc. Use of smaller proportion of moistening liquid gave a finished product with more total extractive. Fluidextracts made by different operators will vary considerably unless proportion of moistening liquid is standardized. On the basis of studies on belladonna root, nux vomica and cinchona it was found that 800 cc. of weak percolate from the second portion of drug as specified in U. S. P. X is satisfactory and preferable to U. S. P. XI and N. F. VI as well as N. F. II and III.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 27 (1938), 105. (Z. M. C.)

Drug Extraction. XVI. Effect of the Form of the Percolator on the Efficiency of Extraction. Forms of percolators were Oldberg, funnels and straight glass tubes of uniform diameter. The Oldberg and the funnel show more efficient extraction of alkaloids than the glass tubes. Tubes gave a somewhat higher yield of total extractive in the first reserve but on the basis of totals the difference seems to have no practical significance. Comparison of the Oldberg percolator with a glass tube of approximately the same diameter, neither form shows any appreciable advantage.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 27 (1938), 205. (Z. M. C.)

Drug Extraction. XVII. Modified Repetition Diacolation. Historical phases of repetition diacolation are reviewed, taking up advantages and disadvantages of the process, the drugs upon which the method was tested and the results obtained and variations of the method. Experimental work is reported in considerable detail. Superiority of the modified process over processes A and C of the U. S. P. and N. F. in preparation of fluidextract of belladonna root is shown to agree with results of other workers on other drugs. Division of drug into three equal portions makes the process simpler than U. S. P. and N. F. There appears to be no necessity for introduction of the new term repetition diacolation. There is nothing in the process that has not been used by others. Use of cylindrical tubes is not an innovation nor is displacement of alcoholic

menstruum by water new. Oldberg percolators are easier to pack and clean than cylindrical tubes.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 27 (1938), 211. (Z. M. C.)

Drug Extraction. XVIII. Modified Diacolation. History of diacolation is reviewed, including advantages and disadvantages and something about the drugs upon which diacolation has been tested. Details of experimental work are reported with a tabulation of results and an illustration of the extraction apparatus used. Results are discussed and the work summarized as follows: Full strength fluidextracts of belladonna root were made by slow percolation under pressure through an extremely long column of drug without resorting to collection of various fractions of weak percolate as in fractional percolation and without use of heat to concentrate weak percolate as in Process A of the U. S. P. The apparatus devised and assembled in the present study consisted of a series of tubes of Pyrex glass pipe, connected by glass U-tubes of the same diameter. The drug was packed in one long continuous column and the menstruum forced through by compressed air. A discussion is given of the patented extraction apparatus which is used in the process of diacolation as carried out by Breddin.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 27 (1938), 290. (Z. M. C.)

Extract of Opium—Adjusting the Morphine Content of. In this paper read before the Pharmaceutical Congress at Groningen, Nov. 26, 1938, the author cites analytical data and summarizes his findings as follows: (1) It has been found that when Pulvis Opii is brought to standard with Saccharum Lactis that the method of the Netherlands Pharmacopœia gives results for morphine which are too low. (2) Milk sugar, however, does not interfere with the determination of the morphine content of extract of opium. (3) When a commercial opium extract runs too low in morphine content it is well to repeat the assay using more NH_4Cl. In powdered opium diluted with milk sugar the morphine content always runs low but if one uses four times the directed amount of NH_4Cl an exact result is obtained. With extract of opium the milk sugar content could also be the source of other errors through circumstances, which, however, did not arise in these experiments.—IR.-P. KUIPER. *Pharm. Weekblad*, 75 (1938), 312. (E. H. W.)

Glycerite of Starch. Glycerite of Starch B. P. is unsatisfactory when stored owing to the separation of liquid. This separation is due to syneresis (contraction of the gel) and is retarded, but not prevented, by storing in a well-closed container. Syneresis is accelerated in a moist atmosphere and retarded in a dry one. Additional water added to the formula also accelerates syneresis. The addition of tragacanth renders the preparation more stable but alters its appearance. Glycerite of starch prepared from wheat starch is much more stable than that prepared from other varieties of starch, and is recommended.—I. ROBERTS. *Quart. J. Pharm. Pharmacol.*, 11 (1938), 18–25. (S. W. G.)

Grey Powder. Volatilization of Mercury from Wrapped Powders. Mercury volatilizes from wrapped powders and tablets of Grey Powder. The rate of volatilization is considerably increased by rise of temperature, and both powders and tablets should be stored in a cool place. A well-closed container should be used for storage, preferably a bottle, and it is an advantage to use a waxed paper lining inside the white demy in wrapping powders. Glazed cardboard boxes are preferable to those made of rough cardboard. Four tables are given to demonstrate the above findings.—I. ROBERTS. *Pharm. J.*, 140 (1938), 487. (W. B. B.)

Histidine Ascorbate Solutions—Stable, Process for the Production of. Aqueous histidine ascorbate solutions are saturated with gases freed from oxygen and are stored in containers containing no oxygen.—S. A. PRODUITS ROCHE. Belg. pat. 422,061, July 31, 1937. (A. P.-C.)

Hydrogen Peroxide—Stabilization of Highly Concentrated Solutions of. A pure 80 to 85% hydrogen peroxide can be obtained by fractional distillation of the crude product and condensation of the vapors at 40° to 45° C. Stabilization of the concentrated solution can be obtained by addition of phenacetin or salicylic acid; the same products are also suitable for the stabilization of dilute aqueous solutions of hydrogen peroxide; the amount required is about 2 Gm. per liter. The stabilizing effect of acetanilide is insufficient. The stabilizing effect of a product is related to the purity of the peroxide solution.—S. N. LOURIÉ and N. I. KOLBINE. *J. Khim. Prom.*, 14 (1937), 757–761; through *Chimie & Industrie*, 39 (1938), 117. (A. P.-C.)

Liquor Magnesii Citratis, U. S. P. XI—Study of the Factors Influencing the Stability of. Report is made of an extensive study of solution of magnesium citrate. Six series of solutions were prepared each consisting of twenty solutions and each solution in a series contained a concen-

tration of magnesium salt or salts differing from others of the series. Findings are tabulated. Factors studied were influence of syrup, of potassium citrate, of carbon dioxide, of varying magnesium concentration, of a lesser concentration of citric acid and of combinations of two or more at a time. Stability was found to be dependent upon the quantity of magnesium oxide used and was influenced by presence of sucrose and carbon dioxide. Stable samples can be prepared according to the official formula if the magnesium carbonate used is of the equivalent of from 39.2 to 40% of magnesium oxide. Since it is impractical, if not impossible, to obtain magnesium carbonate having a magnesium oxide equivalent within this range, the use of calculated quantities of magnesium carbonates having other equivalents is suggested and a table is given by means of which the necessary quantities of these carbonates can be ascertained.—GEORGE E. CROSSEN and CHARLES H. ROGERS. *J. Am. Pharm. Assoc.*, 27 (1938), 119. (Z. M. C.)

Medicinal Tablets Coated with a Sugar Mould—Production of.—N. GOLLWITZER and M. STEIGER. Brit. pat. 471,116; through *J. Soc. Chem. Ind.*, 57 (1938), 228. (E. G. V.)

Mineral Oil-Agar-Agar Emulsions—Preparation of. An emulsion of mineral oil and an aqueous solution of agar-agar is prepared by breaking up and dispersing the constituents of the emulsion while maintaining the temperature at greater than the hydrating temperature of the agar until the physical structure of the emulsion has been attained. The mass is then sprayed within a confined chamber against a stream of confined air properly controlled as to volume, temperature and humidity to lower the temperature of the particles quickly to less than the hydrating temperature of the agar.—E. F. HULBERT. U. S. pat. 2,068,136; through *J. Soc. Chem. Ind.*, 57 (1938), 227. (E. G. V.)

Pepsin—Sterilization of. The literature is very meager as to the sterilization of pepsin. Three references, however, appear: (1) the method of Luigi Nobili (*G. Farm. Chim. Sci. Affini*, 83 (1934), 351; through *Chem. Zentral.*, 1 (1935), 1270) in which sodium benzoate solution and chloretone are used, the final solution being sterilized by heating at 50–56° for 1 hour, 5 or 6 times during 24 hours: (2) the method of van de Velde (page 567 of the bulletin of the 12th International Pharmaceutical Congress, Brussels, 1935, involving the treatment for ten days with purified carbon disulfide; and finally (3) the filter method proposed in 1935 by Dr. Blomberg at Amsterdam (*Pharm. Weekblad* (1936), 45) in which the pepsin solution is filtered through a Seitz- or through a Chamberland-Pasteur filter. The author investigated the three methods. Two questions must be answered in such an investigation: (*a*) Does the pepsin retain its proteolytic properties after sterilization and (*b*) is the finished product sterile? Results showed that the proteolytic property of the pepsin was completely lost with the Nobili method. The method of van de Velde gave better results as far as the proteolytic property of the pepsin is concerned, the activity being retained fairly well. The method, however, does not give assurance of sterilization. When pepsin solutions are filtered through a Seitz-filter the proteolytic property disappears entirely, the pepsin being absorbed by the filter. Glass bacterial filters such as Schott G 5 on 3 give better results and if the filters are selected, carefully controlled satisfactory results can be obtained.—C. G. VAN ARKEL. *Pharm. Weekblad*, 75 (1938), 43. (E. H. W.)

Procaine Hydrochloride—Solutions of. Procaine hydrochloride, being the salt of a strong acid and of a weak base, which is slightly stronger than ammonium hydroxide, undergoes hydrolysis to a small extent in water at ordinary temperature. A 2% solution has a p_H of 5.8. On heating such a solution, as in sterilization of the solution by boiling, or at 120° C. during autoclaving, the extent of this hydrolysis increases, an appreciable amount of hydrochloric acid being produced at 100° C. The acidity developed at these higher temperatures is responsible for the further decomposition of procaine, especially during autoclaving in normal glass containers. In order to follow the extent to which procaine hydrochloride solutions undergo decomposition on heating, it is insufficient to determine the p_H of the solutions, for this changes only slightly in alkali-free glass containers, and does not reflect the true extent of the decomposition. Two determinations are necessary: (1) Determination of undecomposed procaine, and (2) determination of undecomposed procaine together with *p*-aminobenzoic acid produced by the hydrolysis of the ester. Methods are given for the determination of undecomposed procaine and for the subsequent determination of total procaine.—F. HARTLEY. *Pharm. J.*, 140 (1938), 461. (W. B. B.)

Sterilization in Pharmaceutical Operations—Contributions to Knowledge of. *Seitz Filter.*—Since the filter mass gives up magnesium compound, it should be treated with dilute hydrochloric acid and rinsed well with water. For complete asepsis use two filter discs. The filter medium

adsorbs alkaloids. *Membrane Filter.*—The glass receptacle may be sterilized at 140° C., and the rest of the apparatus with steam. The membrane does not adsorb any of the solute. It is valuable for the sterilization of thermolabile pharmaceuticals. *Morphine Hydrochloride.*—p_H Determinations of 1% morphine solutions in 1-cc. ampuls indicate no change if $^1/_{500}N$ hydrochloric acid is used as the solvent when sterilized in a current of steam. The use of freshly recrystallized morphine hydrochloride minimizes discoloration. *Sucrose.*—The influence of heat on 10 or 20% solutions is negligible. *Absorbent Cotton.*—Fifteen minutes in steam at 120° C. or thirty to forty minutes at 110° C. is sufficient. *Boric Acid.*—The solution or the ointment may be sterilized in a current of steam without change. *Formic Acid.*—1% solutions of this or other acids are best made by dilution of concentrated solutions with sterile water under aseptic conditions. *Methenamine.*—10% solutions are rendered sterile by passing through a Seitz or membrane filter. *Calcium Gluconate.*—Solutions are sterilized by reflexing for two or three hours and heating in steam for one hour on three successive days. *Sodium Chloride.*—The salt is calcined in a crucible for a few minutes and dissolved in sterile water. *Sodium Bicarbonate.*—Solutions may be sterilized by filtration through a membrane or Berkefeld filter or by steam heating in a glass-stoppered bottle with little change in p_H. *Cocaine Hydrochloride.*—Filtration is the best method, but sterile solutions may also be prepared from cocaine hydrochloride rendered germ-free by treatment with sterile alcohol and dried not above 40° C. *Quinine Hydrochloride.*—Sterilization with heat caused discolorization, but by purifying the precipitated free base and reconverting it to the hydrochloride, a solution was obtained which remained clear and colorless. *Iodoform.*—Though not *a priori* sterile, it may be rendered sterile by heat or by treatment with 0.1% mercuric chloride solution or by exposure to formaldehyde vapor from paraformaldehyde. *Nutrient Broth.*—A perfectly clear solution was obtained by the addition of $^1/_2$% egg albumin and heating with steam. Peptone solutions may also be clarified in this manner. An outline for a course in pharmaceutical sterilization with exercises for the individual student is included.—ERNST DEUSSEN. *Arch. Pharm.*, 276 (1938), 27. (L. L. M.)

Tannin-Bearing Galenicals—Critical Study of. The following questions were studied: effects of changes in menstrua, as specified in the recent revisions of the U. S. P. and N. F. upon permanency, astringency and total extractive in the official tannin-bearing galenicals; the effect of precipitation upon astringency; whether there is correlation between astringency, total extractive and precipitation; whether precipitation can be prevented by the use of selective menstrua; whether these products can be assayed for tannin. U. S. P. X and XI and N. F. V and VI tinctures and fluidextracts of krameria, kino, nutgall, gambir, hamamelis leaves, castanea, rose and uva ursi were studied. Experimental work is described and discussed. The following were more permanent by the new formulæ: tincture of kino, fluidextract of hamamelis leaves, fluidextract of castanea and fluidextract of krameria. U. S. P. X compound tincture of gambir had less precipitate than that of N. F. VI which is a much stronger preparation. Tincture of krameria showed no precipitation if made by type process M, using alcohol 9 and glycerin 1. Fluidextracts of uva ursi, krameria and rose contain very high percentages of extractive. Changes which occur upon standing seem to result in marked increase of reducing substances. Any existing method of analysis does not give an accurate assay of tannin. Until the chemistry of tannins is better known a successful method is unlikely. Precipitation does not seem to materially affect astringency. Autoclaving of the crude drug prior to making the preparations definitely reduced precipitation in the fluidextracts of rose, uva ursi and hamamelis leaves. Light does not cause precipitation.—S. W. ARNETT and C. O. LEE. *J. Am. Pharm. Assoc.*, 27 (1938), 312. (Z. M. C.)

Valeriana—Fluidextracts of, in Pharmacy. Analytical data for four commercial and two official preparations of the extract show marked variations in, *e. g.*, density, alcohol and glycerol content, volatile acid and ash. The adoption of a standardized method of preparation to yield products conforming with the pharmacopœial requirements is recommended.—A. BARTOLE. *Boll. chim.-farm.*, 76 (1937), 613-614, 617-619; through *J. Soc. Chem. Ind.*, 57 (1938), 319. (E. G. V.)

PHARMACOPŒIAS AND FORMULARIES

First Pharmacopœia Published in the United States—Who Was the Author of? The literature on this subject is cited and some important quotations given. No conclusions are drawn. The existing confusion should be clarified if possible.—C. O. LEE and F. J. LEBLANC. *J. Am. Pharm. Assoc.*, 27 (1938), 142. (Z. M. C.)

Folia Digitalis. Applications of the Pharmacopœia Text and Revision Proposals. B. recommends that the ambiguous instructions of the German Pharmacopœia that digitalis flasks should be paraffined be changed to instructions that the inner surface of the corks of such flasks be paraffined. The latter procedure is just as effective as external sealing of the flask against moisture, and is more economical. Vaselined glass-stoppered flasks are also satisfactory.—H. BREDDIN. *Pharm. Ztg.*, 82 (1937), 1213; through *Squibb Abstr. Bull.*, 11 (1938), A-245. (F. J. S.)

Formulary of the Swedish Medical Control Board 1937—Alterations and New Preparations in. Notes and comments are cited on the changes and new preparations contained in the 1937 edition of the Swedish Medical Control Board's Formulary or Extra Pharmacopœia (the "M. B. för Läkare"). About 227 items are considered, hence the original should be consulted. It is noted that identity and analytic control rubrics are not cited in this book, but that many of the drugs and ingredients will be covered in this regard in a forthcoming issue of: "Methods of Analysis Used by the Apothecaries Control Laboratory."—S. KJELLMARK. *Farm. Revy*, 37 (1938), 117, 133, 153, 173. (C. S. L.)

French Pharmacopœia—New. "Codex Medicamentarius Gallicus." The book is published in two volumes. Volume I, which contains 600 odd pages, is largely concerned with legislation governing the practice of pharmacy and the distribution of poisons. More than 100 pages are occupied by a table of all the drugs and preparations included in this and the five previous issues of the Codex, showing the editions in which they have, respectively, been included. Volume II, which consists of the pharmacopœia proper, contains 1500 pages. One of the features of the book is the inclusion of colored plates illustrating plants which yield medicinal drugs. The style of the monographs of the new French Pharmacopœia differs in many respects from that to which British pharmacists are accustomed. The recommendation of the Brussels Conference that Latin titles should be used has not been followed. In most of the monographs the book includes a paragraph on incompatibility. A very large number of items of botanical origin are described. The bacterial products include three toxoid-antitoxins. This is the first national pharmacopœia to include monographs on the sex hormones and their derivatives. Monographs deal with vitamins A, C and D, together with carotene; biological assays are given for each, while for vitamin C titrations with standard alkali and standard iodine are also included. The number of galenical preparations included is substantially larger than in the previous edition of the Codex. In the monograph on ampuls, tests are described for ensuring freedom of the glass from excessive alkalinity and from lead. Those surgical dressings which are officially recognized are cotton wool, sterile cotton wool, absorbent gauze and catgut.—ANON. *Pharm. J.*, 140 (1938), 239, 269. (W. B. B.)

Meaning——? The author shows that in writing and speaking it is easier to mean what we say than to say what we mean. As examples, he cites "an acid-taste" or "an acidulous taste." Not all acids are sour; some are bitter, some pungent, some bland. Again, in connection with distilled water and the expression "indicating a p_H of not less than 5.8," to what does "not less than" refer?—WILBUR L. SCOVILLE. *J. Am. Pharm. Assoc.*, 26 (1937), 847. (Z. M. C.)

Pharmacopœia—Addendum to the British. Comments upon the following preparations included in the Addendum 1936 to the British Pharmacopœia: Ascorbic Acid, Hydrated Calcium Chloride, Calcium Gluconate, Ergometrine, Liquid Extract of Stramonium, Dry Extract of Stramonium, Citrated Ferrous Chloride.—L. W. HOWARD. *Pharm. J.*, 140 (1938), 550. (W. B. B.)

Pharmacopœia—Batava. Minutes of meetings (Monday, June 3, 1799; Thursday, August 15, 1799, and Wednesday, August 28, 1799) concerning this old and famous pharmacopœia are published from the old archives at Amsterdam. The minutes contain several resolutions of historical interest.—D. VIEYRA. *Pharm. Weekblad*, 75 (1938), 5. (E. H. W.)

Pharmacopœia—Batava. Additional letters are published concerning this Pharmacopœia, the letters being dated during the year 1799. The Committee named are P. Driessen, Med. Doct. et Art Pharm. Profess. Ord. Groningen, S. J. Brugmans, A. L. M., Phil. et Med. Doct. Hist. Nat. et Bot. Prof. Ord. Leyden, G. Vrolik, Med. Doct. Anat. Phisiol. Art. Obst. et Bot. Prof. Amsterdam, G. G. Ten Haaff, Med. Doct. Rotterdam and J. R. Deiman, Med. Doct. te Amsterdam. Notices of the publication are also included in the article.—D. VIEYRA. *Pharm Weekblad*, 75 (1938), 26. (E. H. W.)

DISPENSING

Belladonna—Bulgarian. According to investigations made by the author, it appears that decoctions prepared from Bulgarian belladonna may contain anything from 40 to 80% of the alkaloid present in the root.—R. H. HENRIKSEN. *Pharm. J.*, 140 (1938), 240. (W. B. B.)

Cod Liver Oil Ointment. The following directions are given for the preparation of a cod liver oil ointment: 100 Gm. of cera flava are melted on a water-bath and mixed with 500 Gm. of melted vaseline. When the mixture has cooled to 45°, 400 Gm. of cod liver oil are added, the oil having been previously heated on the water-bath to 35°. The whole is carefully stirred so that no air is included in the mass. The temperatures must be carefully controlled so that the activity of the vitamin A is not destroyed.—*"de Krankenhausapotheke,"* No. 2, page 18; through *Pharm. Weekblad*, 75 (1938), 339. (E. H. W.)

Dispensing—Determination of the Reasonable or Permissible Margin of Error in. VI. Elastic Filled Capsules. For the purpose of the study, capsules were classified in two groups: liquids in transparent capsules and suspensions in non-transparent capsules. Three series of experiments were carried out and these are explained and results tabulated. The following conclusions were reached: 1. The factors largely responsible for the variation in weight of machine made elastic filled gelatin capsules are (1) the uniformity in thickness and elasticity of the gelatin sheet used as the shell, (2) the accuracy with which the medicament is measured or weighed, (3) the uniformity of the molds, (4) the uniformity with which the medicament is distributed throughout the capsules of one batch, and (5) the uniformity of pressure applied by the machine in sealing. 2. From the data obtained in the tests made it would seem that twice the standard deviation is a reasonable margin of error for machine made elastic filled gelatin capsules. This would include 96.92% of the capsules weighed.—MARVIN J. ANDREWS. *J. Am. Pharm. Assoc.*, 27 (1938), 374. (Z. M. C.)

Dispensing Problem—Professional. The author, who is a teacher of a course in compounding, deplores the fact that pharmacists find difficulty in rendering the very best professional service because they find difficulty in discussing with physicians possible improvements in prescriptions. Instead of improving the prescription and the service to the patient a few such attempts lead to loss of the physician's business. Further discussion of the question leads to the suggestion that by organization, incompatible prescriptions that need alteration might be referred to some especially well-qualified pharmacist whose task would be to make all suggestions and return them with copies of prescriptions to the physicians.—W. D. STROTHER. *J. Am. Pharm. Assoc.*, 27 (1938), 420. (Z. M. C.)

Drops from Dropping Bottles—Size of. The author determined the weight of drops from several styles of weighing bottles. Twenty drops were collected and weighed, the drops being dropped from half-filled bottles. Tables are given showing the weight of 20 drops of distilled water from various sizes and makes of bottles.—J. M. B. EDEL-VISSER. *Pharm. Weekblad*, 75 (1938), 3. (E. H. W.)

Emulsions—Recent Processes for Preparation of. The preparation of emulsions of fatty anhydrides and the use of lecithin for, *e. g.*, leather-oiling emulsions required to be stable to copper and aluminum salts, etc., and of other stabilizers are discussed.—A. FOULON. *Fette u. Seifen*, 44 (1937), 435–437; through *J. Soc. Chem. Ind.*, 57 (1938), 187. (E. G. V.)

Enteric Coatings—Study of. Purposes of this investigation were to study the physiological processes to which enteric coatings are subjected, to study the relative merits of materials now used for enteric coatings and to provide a more reliable coating. The four classes of medicine that should have enteric coatings are: those that by prolonged contact cause irritation of the stomach; those that injure digestion by giving insoluble precipitates with pepsin and peptones; those that are made inactive or decomposed by gastric juice; those that should reach the intestine in concentrated form. Also the intestine is the normal place for absorption. Tests *in vitro* were similar to those of Martindale and Westcott and Wruble; tests *in vivo* were made by means of fluoroscope and X-ray. The physiological factors influencing disintegration of enteric coatings were: the time required for the pills or capsules to pass from the stomach; the acidity of the stomach and intestines; and the enzyme activity of the digestive tract. Materials studied were keratin, salol stearic acid mixtures, sandarac, collodion, tolu and benzoin, lacquers, albuminoids, waxes and formaldehyde-gelatin. Finally a mixture of 20 parts castor oil and 100 parts shellac dissolved in alcohol was found to be satisfactory. Time of administration was studied also.

Sodium tetraiodophenolphthalein was found to be superior to barium sulfate as an opaque. Conclusions were the following: (1) Only shellac and shellac-castor oil mixture seemed to disintegrate in the intestine in reasonable time and not be damaged by stomach conditions. (2) Best results were obtained when capsules were taken on an empty stomach one or two hours before meals. (3) A successful enteric coating depends on something other than alkalinity. Shellac and castor oil digest whether intestinal fluid is neutral or slightly acid. (4) Small capsules pass out of the stomach more uniformly and in less time than large ones.—J. T. GOORLEY and C. O. LEE. *J. Am. Pharm. Assoc.*, 27 (1938), 379. (Z. M. C.)

Hydrogenated Castor Oil in Ointments. II. Cosmetics. Hydrogenated castor oil has been found to be a satisfactory base for ointments so it was tried as a substitute for waxes in cosmetics. The U. S. P. cold cream and other borax creams and also triethanolamine creams were tried. A hydrogenated castor oil (m. p. 86° C.) was found to be unsatisfactory for a borax cream but is satisfactory if triethanolamine stearic acid is used as emulsifier. Creams are stiffer than those prepared with white wax or spermaceti. Equal parts of hydrogenated castor oil with white wax or spermaceti possesses greater hardening power than any of the bases alone. The total solidifier content of cold creams may be reduced by 40% by using a mixture of equal parts of hydrogenated castor oil and wax.—GEORGE D. FIERO and LAURENCE D. LOCKER. *J. Am. Pharm. Assoc.*, 27 (1938), 402. (Z. M. C.)

Lime Liniment with Ichthyol—Note on. The emulsion, which separates on addition of the ichthyol, may be restored by carefully adding slaked lime while triturating. The following formula is recommended: Lime Liniment 50 Gm., ichthyol 2.5 Gm., slaked lime 1.0 Gm. For a 2% ichthyol emulsion 0.35 Gm. of slaked lime is sufficient. The emulsion prepared as above is quite stable, and after 4–5 days solidifies to the consistency of an ointment.—E. O. K. VERSTRAETE. *J. pharm. Belg.*, 20 (1938), 167–169. (S. W. G.)

Nux Vomica—Extraction of, in the Making of Tincture. Attention is directed to the various changes that have been made from time to time in the preparation of this tincture, particularly the difference in color in those of U. S. P. XI and U. S. P. X. Report is made of a study in which the menstruum used was varied. Assays indicated all were within Pharmacopœial range of 0.108 to 0.120%. U. S. P. XI was slightly higher than the others and it also had the highest total solids. The nature of the residue is of interest. When the menstruum contained hydrochloric acid, the residue was black with a tarry or phenolic odor while without the acid the residue was amber colored and almost lacking in odor. As a possible explanation of the color it is suggested that the glucoside, loganin, is hydrolyzed in the presence of the acid, yielding glucose and red substance. In the literature it has been reported that loganin turns red in the presence of sulfuric acid. Ground nux vomica, moistened with sulfuric or hydrochloric acid, turns pink but shows no change with acetic acid. Tintures containing hydrochloric acid reduce Fehling's solution.—NELLIE PERRY WATTS. *J. Am. Pharm. Assoc.*, 27 (1938), 138. (Z. M. C.)

Oil of Tar and Iodine Paint, B. P. C. In making Pigmentum Olei Picis cum Iodo B. P. C. a violent reaction occurs. Upon investigation, it was noted that the heavy rectified oil of tar gives a preparation which is not attended by any chemical incompatibility. Most of the rectified oil of tar on the market appears to conform to the description of the light oil. There is much confusion on account of the synonyms in general use for these oils, and more specific characters should be included in the B. P. C. monograph to distinguish between them. In this connection rectified oil of tar is officially described in the U. S. P. X and refers to the heavy oil.—D. RITCHIE. *Pharm. J.*, 140 (1938), 357. (W. B. B.)

Oil of Turpentine—Transparent Emulsion of. Transparent emulsions are made by equalizing the refractive indices of both phases at the same temperature. Procedure is given for a transparent emulsion of oil of turpentine of U. S. P. strength. The problem of making transparent emulsions is largely one of finding physiologically inert substances to build up the refractive index of the aqueous phase or to lower that of the oil phase. The former is easier. Solutions of invert sugar, honey, glucose and Karo corn syrup may be used. The emulsion appeared to be stable for at least a year. After eighteen months crystals were deposited. After two years it became quite yellow.—P. A. FOOTE and C. H. GILLILAND. *J. Am. Pharm. Assoc.*, 27 (1938), 336. (Z. M. C.)

Ointments—Colloidal Clay Base for. The use of Bentonite gels is advocated in preparing medicinal ointments. The gel is prepared by covering the Bentonite with the water and mixing

until the product is homogeneous. A gel containing 6% Bentonite has the consistency of glycerin; while a 20% gel has the consistency of anhydrous lanolin. Preparations made with the more limpid base are called jellies. The absorbent properties of the base is claimed to be beneficial in treating certain dermatoses. It is also claimed that the gel will prevent absorption through the skin of certain active agents such as mercury; thus restricting its parasitic action to the skin's surface. The following formulas using different colloidal clays are given: (1) Ointment of Yellow Mercuric Oxide. Yellow oxide of mercury 0.3 Gm., Bentonite 2.5 Gm., distilled water 15.0 Gm. Add the oxide gradually to the gel. (2) Mercurial Ointment. Mercury 2 Gm., Bentonite 2 Gm., distilled water 10 Gm. Intimately mix the mercury and Bentonite, then add the water. (3) Zinc Oxide Paste. Zinc oxide 100 Gm., talc (or calcium carbonate) 100 Gm., glycerin 100 Gm., water 100 Gm., Bentonite 20 Gm. (4) Zinc Oxide Jelly. Zinc oxide 10 Gm., glycerin 10 Gm., Bentonite 6 Gm., water 100 Gm.—H. GRIFFON. *J. pharm. chim.*, 27 (1938), 159–165. (S. W. G.)

Particle Fineness in Homeopathic Triturates. The author reviews this subject including particularly the publications of Dr. H. Neugebauer. He summarizes as follows: (1) In the trituration of the 6th decimal potential a portion of the triturated drug has been reduced to colloidal fineness. (2) In this triturate there are existing simultaneously, coarse particles of the drug of various sizes, to about the dimensions of those existing in ores and lower potential divisions. The preparations are thus actually polydisperses in which all particle sizes from the coarse to the colloidal are present. (3) The ratio between the number of large and finely dispersed particles depends primarily upon the degree of trituration of the respective material and also upon the relative milk-sugar content and the trituration time. Several charts and tables are given.—C. J. F. L. KNUFMAN. *Pharm. Weekblad*, 75 (1938), 57. (E. H. W.)

Prescription Difficulty. The following prescription was filled as written but was brought back by the physician because the sulfur floated on top and would not remain mixed sufficiently to allow uniform application: precipitated sulfur 10 Gm., lime water 50 Gm., cherry laurel water 10 Gm. The difficulty is eliminated if the sulfur is first rubbed with an equal amount of alcohol. This removes entrapped air which causes flotation. Several chemical reactions also occur. The benzaldehyde cyanhydrin + $Ca(OH)_2$ gives benzaldehyde and $Ca(CN)_2$, the S + $Ca(OH)_2$ gives CaS and eventually polysulfides and the CaS + $Ca(CN)_2$ gives thiocyanates.—L. ROSENTHALER. *Pharm. Acta Helv.*, 13 (1938), 1. (M. F. W. D.)

Quinine Salts—Incompatability of. The author discusses the following prescription which turns yellow on standing: Luminal 0.030, Anæsthesini 0.100, Sulf. Quinine 0.050, Citr. Caff. 0.150, Sacchar. Alb. ad, 0.500.—J. J. L. ZWIKKER. *Pharm. Weekblad*, 75 (1938), 333. (E. H. W.)

Salicylate Injection—An Intravenous. Directions are given for the preparation of a solution containing sodium, potassium and calcium salicylates for intravenous injection, in which the ions are present in the same relation as in Ringer-Locke solution. The formula for 5 Gm. of polysalicylate per 100 cc. is as follows: Salicyl. natr. 4.695, Salicyl. kalic. 0.189, Salicyl. calc. 0.116, Aqua ad 100 cc. Sodium salicylate is usually available in all pharmacies and the others may be made extemporaneously from the corresponding carbonates. For this purpose the author suggests the following formula: Salicyl. natr. 4.695, Acid salicyl. 0.250, Carb. kalic. 0.074, Carb. calc. 0.037, Aqua ad 100 cc. It is well to test the solution after boiling of the carbon dioxide to insure that it is not too acid. If a good grade of potassium carbonate has been used the solution should have a p_H of 6. The solution must be sterile. It seems to be well tolerated.—H. STEENBRUGGEN. *Pharm. Weekblad*, 75 (1938), 174. (E. H. W.)

Taraxacum, B. P. C.—Liquid Extract of. The following method of manufacture of this extract has been found to be more convenient than the British Pharmaceutical Codex process, and gives good results: Mix the alcohol with 2000 cc. of distilled water. Moisten the taraxacum with the mixture and pack it loosely in a percolator. Add the remaining portion of the mixture and set aside for four days. Allow the liquid to percolate slowly and reserve the first 850 cc. of the percolate. Collect the remainder separately and mix it with the liquid obtained by pressing the marc. Strain the mixture and evaporate to a soft extract; dissolve it in the reserve portion and add sufficient alcohol (30%) to produce the required volume. Allow to stand for fourteen days and filter.—R. D. KOTWAL. *Pharm. J.*, 140 (1938), 461. (W. B. B.)

Tragacanth Substitutes. Substitutes for use in the manufacture of toilet preparations have been tragaya, carob and romos. Tragaya is a light buff-colored powder which swells almost at

once in warm water (70° C.). Maximum viscosity is attained when the mucilage cools to normal temperatures, and the product is similar to gels prepared from good-quality gum tragacanth. The mucilage is opalescent and requires to be preserved preferably with about 0.15% of nipagin-M or its sodium salt. A formula for a hair cream incorporating tragaya gum which may be readily adapted for any specific purpose is given. Commercial carob gum is the separated and powdered endosperm of the seeds of *Ceratonia siliqua*, the locust-bean tree. It is a pale buff-colored powder and its chief constituents have been shown to consist of manan and galactan together with an enzyme, which causes mucilages gradually to lose viscosity if not previously destroyed by heating the gel on a water-bath for about thirty minutes. Carob gum produces mucilage of approximately the same viscosities as those given by gum tragacanth in similar concentrations. A preservative is necessary and the parahydroxybenzoic acid ester (nipagin) is recommended. Romos is a white powder producing gels similar to those of gum tragacanth but requiring less gum. It has the advantage of being uniform in quality and has strong adhesive properties, keeps indefinitely and its mucilages generally require no preservative.—ANON. *Chemist and Druggist*, 128 (1938), 192. (A. C. DeD.)

PHARMACEUTICAL HISTORY

Alonzo Robbins, Pennsylvania's Number One Pharmacist. A sketch of the life of one whose Pennsylvania State Certificate was Number One and who was appointed president of the first State Board.—JOHN E. KRAMER. *J. Am. Pharm. Assoc.*, 27 (1935), 432. (Z. M. C.)

Drug Store—a Tercentenary Celebration. A history of the "Goldene Apotheke" in Basel which in May 1938 was 300 years old.—ANON. *Schweiz. Apoth.-Ztg.*, 76 (1938), 323. (M. F. W. D.)

Hospitals—Earliest. The author relates many things of interest that show that the modern hospital is an outgrowth of institutions which arose in pagan antiquity through the temples, the surgeries, the valetudinaria and the Roman military hospitals.—ELEANOR KAIRIS. *J. Am. Pharm. Assoc.*, 27 (1938), 338. (Z. M. C.)

Japanese Pharmacists; Their History, Development and Their Present Cultural Importance. A brief account of the progress of pharmacy in Japan.—ANON. *Schweiz. Apoth-Ztg.*, 76 (1938), 272. (M. F. W. D.)

Linnæus—King of the Flowers. A biographical sketch of the "greatest botanist of all time."—LOUIS H. RODDIS. *J. Am. Pharm. Assoc.*, 27 (1938), 250. (Z. M. C.)

Medicine in the 15th Century. A brief historical review of some of the superstitions of the medicine of the middle ages.—HANS GASSER. *Pharm. Presse*, 43 (1938), 86. (M. F. W. D.)

Pharmaceutical Organization—Military, in Various Countries. Germany. A brief review of the development of the pharmacy corps in the German army since 1787.—A. CEDERGREN. *Farm Revy*, 37 (1938), 21. (C. S. L.)

Professor Hans Molisch. A biographical sketch of the eminent Austrian botanist.—KARL HÖFLER. *Scientia Pharm.*, 9 (1938), 4. (M. F. W. D.)

PHARMACEUTICAL EDUCATION

American Council of Education—Recent Development in the Work of. The author gives a brief résumé of the history and purposes of the Council; points out that most of the activities are carried on by committees and speaks briefly of some of them and the projects undertaken. At a conference on professional education called by the council it was decided that the next conference would consider the following questions: (1) How far should a common preliminary education be required by all the professions? (2) How may the ethics of the professions be promoted? (3) How may universities be influenced in matters concerning professional education?—RUFUS A. LYMAN. *J. Am. Pharm. Assoc.*, 27 (1938), 258. (Z. M. C.)

Aptitude Testing in Pharmaceutical Education—Problem of. Since Binet's announcement in 1908 of "a scale for measuring intelligence" a large body of data on intelligence testing has become available. The intelligence test, however, is inadequate as a means of predicting aptitude in specialized fields. Placement tests have been devised for many subjects and the coefficient of reliability is higher than for intelligence tests alone but they do not determine special aptitudes. Aptitude tests have been devised also. Several studies have shown correlation between scholarship and success as measured by salary. It is possible that pharmaceutical aptitude

may be predicted by means of determination of general scholastic aptitude and correlation with grades received in college and on state board examinations and determination of specific ability as measured by a special battery of tests previously standardized and correlation with grades received in college and on state board examinations. Prediction as to success in life cannot be made but data might be correlated. Proposing a possible series of tests, they should include: (1) reading and comprehending; (2) manipulation; (3) reasoning and interpretation of directions; (4) mathematical ability (particularly in arithmetic); (5) inventiveness. Such a project would need to be carried out for ten years or longer and would require the support of colleges of pharmacy and pharmaceutical associations.—SAMUEL S. LIBERMAN. *J. Am. Pharm. Assoc.*, 27 (1938), 430. (Z. M. C.)

Bacteriology for Pharmacy Students—Necessity for a Specific Course In. Attention is directed to the two extremes which seem to characterize the bacteriology curricula of colleges of pharmacy, one following too closely medical bacteriology, the other being too largely botanical and not giving consideration to biologicals that are important in pharmacy. Objectives should be a thorough knowledge of biologicals, thorough training in bacteriological technic, training to deal with personal and mass hygiene and sanitation. These objectives are discussed and an outline of a course included.—FANCHON HART. *J. Am. Pharm. Assoc.*, 27 (1938), 133. (Z. M. C.)

Drugs—Scientific Color Naming of. A project in charge of E. N. Gathercoal is being carried out by experimental work at the National Bureau of Standards. The system of color names has been worked out by the Inter-Society Color Council at the request of the AMERICAN PHARMACEUTICAL ASSOCIATION. The system is described and the report is illustrated with charts.—DEANE B. JUDD and KENNETH L. KELLY. *J. Am. Pharm. Assoc.*, 27 (1938), 208. (Z. M. C.)

Findings of a Drug Clerk Acting in the Guise of the Inquiring Reporter. Report is made of an effort to find out what the public thinks of the present-day drug store as compared with the old-time apothecary shop.—GEORGE A. STALL. *J. Am. Pharm. Assoc.*, 26 (1937), 652. (Z. M. C.)

Hospital Pharmacy—Duke. The author relates some of his experiences in organizing the pharmacy of the Duke Hospital; gives details about management that save time, safeguard the patient, reduce expense, as well as many distinctive features.—I. T. REAMER. *J. Am. Pharm. Assoc.*, 27 (1938), 38. (Z. M. C.)

Manufacturing Pharmacy—Teaching of. The author refers to surveys in 1929 and 1935 that yielded some information concerning courses in manufacturing pharmacy. A table shows type and quantity of preparations made at Purdue University during two years. There is discussion of how the course is managed. Such a course proves an aid in teaching for the following reasons: it can be made to have an appeal that few subjects possess; it stresses the importance of accuracy and technic; it stresses the creative attitude and the urge of curiosity; the demerit system can be used effectively because neatness, cleanliness and accuracy are essential to its success; new preparations and new formulæ create interest.—H. G. DEKAY. *J. Am. Pharm. Assoc.*, 27 (1938), 232. (Z. M. C.)

Glass Blowing—Laboratory, Course in, in a College of Pharmacy Curriculum. Reasons are set forth why colleges of pharmacy should provide systematic instruction in laboratory glass manipulation. Not to train professional glass blowers but having as its object instruction that will enable a worker to become proficient in the common and most frequently used operations involved in the construction of laboratory apparatus.—HORACE M. CARTER. *J. Am. Pharm. Assoc.*, 27 (1938), 136. (Z. M. C.)

Objective Tests in Pharmacy—Some Observations on. The author relates experiences in developing objective examinations though continuing to use the essay type for midyear and final examinations. Course aims were grouped under the three headings: factual knowledge of objectives, ability to use facts in reasoning, ability to locate and use desired information. All types of standardized tests have been tried but these have been narrowed to matching, multiple choice and completion, omitting true-false because of the danger of ambiguity and the possibility of offering leads in questions. More time is required to prepare questions. Student reaction has been favorable. Comparison of results of semester examinations when students have had these with students who have not, show a marked decrease in extremely low grades and the median grade is consistently higher. In the opinion of the author these tests enable an instructor to stimulate study and review; to determine how closely learning is paralleling teaching; to check on attain-

ment of course objectives. He believes that a well-balanced testing program should use both objective and essay tests. Total time required for constructing, administering and scoring is probably about the same as for assay examinations after one has acquired experience and skill in construction of objective tests.—LYMAN D. FONDA. *J. Am. Pharm. Assoc.*, 27 (1938), 229. (Z. M. C.)

Prescriptions—Official Type of, *vs.* the Proprietary Type, Educating the Physician and the Pharmacist Regarding. The author discusses the extent to which trade-marked specialties are being prescribed, quoting from various authorities here and abroad and referring especially to certain portions of "The Professional Pharmacy," a National Drug Store Survey Report. He includes a number of questions and the answers, all of which have a bearing on the subject and concludes with the statement that the National Drug Store Survey shows that 65% of the prescriptions call for from two to ten ingredients.—FRANK A. DELGADO. *J. Am. Pharm. Assoc.*, 27 (1938), 351. (Z. M. C.)

Public Health Work—Rôle of the Pharmacist in Connection with. The author discusses public health especially with relation to what pharmacists can do to assist. He sums up the situation under three main heads as follows: 1. Research and analytical work, especially that which pertains to biological products, narcotic drugs, curative and preventive agents and foods. 2. Distribution or dispensing of material required for use in the destruction or control of carriers of disease, or for the protection of the individual from infection, and the medicinal and other curative agents which may be necessary to restore to normal health those who are actually infected with communicable diseases. 3. Dissemination of information on matters relating to public health. Not the wholesale or promiscuous distribution of pamphlets or circulars to the general public, but specific and pertinent information given to persons who have need of same, because of the fact of the presence of infectious or communicable diseases in their homes or neighborhoods, and are interested in acquiring authoritative information on such subjects and are then in a psychological frame of mind to receive and make proper use of it.—B. E. HOLSENDORF. *J. Am. Pharm. Assoc.*, 26 (1937), 831. (Z. M. C.)

PHARMACEUTICAL LEGISLATION

Food and Drugs Bill—New. The bill is divided into six parts, as follows: (1) General provisions as to food and drugs; (2) Milk, dairies and artificial cream; (3) Other kinds of foods; (4) Importation of certain produce; (5) Markets, slaughter-houses and cold-air stores; (6) General and miscellaneous. The clauses of chief interest to the drug trade are given in this article.—ANON. *Chemist and Druggist*, 128 (1938), 64. (A. C. DeD.)

Pharmacy Regulations in South Africa. The author briefly outlines the regulations governing pharmacy in South Africa indicating the controlling body, the requirements for studying pharmacy, the general layout of the stores, the filling of prescriptions and some of the problems of the pharmacists.—E. S. WEBER. *Schweiz. Apoth.-Ztg.*, 76 (1938), 169. (M. F. W. D.)

Retail Pharmacy—Working Conditions in. The author discusses changes which are necessary to bring about improvement. There are pressure groups who sponsor new stores to further distribution of their own products, wholesalers and manufacturers with few trained pharmacists among them. Colleges of pharmacy where there are too many in a state are indirectly responsible. Some resolutions were offered favoring legislation requiring that manufacturing and packaging of drugs, medicines, toilet articles, dentifrices and cosmetics be under the immediate supervision of a registered pharmacist or some other person approved by the board of pharmacy and that labels carry statements to that effect. It was also recommended that the Section on Education and Legislation recommend to the House of Delegates and through it to the state associations that the subject of working conditions in stores have a prominent place on programs at annual meetings.—WORTLEY F. RUDD. *J. Am. Pharm. Assoc.*, 27 (1938), 47. (Z. M. C.)

Swedish State Pharmaceutical Laboratory—Reorganization of. An official report of the Swedish Medical Control Board on recommendations for the reorganization of the Swedish State Pharmaceutical Laboratory.—L. LÖFQUIST. *Farm. Revy*, 37 (1938), 3, 42; cf. also comment by H. NILSSON. *Ibid.*, 37 (1938), 24. (C. S. L.)

PHARMACEUTICAL ECONOMICS

Graduates and Registered Pharmacists Necessary to Maintain the Professional Personnel at the Proper Level—Number of. Secretary Kelly discusses the statistics that the related as-

sociations have been able to collect and some of the things yet to be determined before the real necessities can be known.—E. F. KELLY. *J. Am. Pharm. Assoc.*, 27 (1938), 50. (Z. M. C.)

Hospital Pharmacy—Problems of. Some of the things most essential are keeping the purchase and control of drugs in the hands of the pharmacist, coöperation with doctors and interns by keeping them informed of U. S. P. and N. F. galenicals and to reduce undesirable proprietaries. No other limitation should be adopted. The pharmacist should be competent to determine the quality of drugs and to supply any special medication desired. Intravenous solutions and ampuls should be made in the pharmacy. All things that make for economical operation should be carefully looked after.—W. MORRISON. *J. Am. Pharm. Assoc.*, 27 (1938), 140. (Z. M. C.)

Law, Economics and Business in Buying a Drug Store. The author discusses the sort of investigation, economic, business and legal, which should be undertaken when purchasing a drug store.—JOSEPH H. GOODNESS. *J. Am. Pharm. Assoc.*, 26 (1937), 839. (Z. M. C.)

Low Profits in Drug Stores—Principal Causes of. The common causes of low profits are within the proprietor's control. The most common is inadequate buying control. How to control buying is explained. Inadequate inventory, inadequate or careless cash control and failure to keep adequate bookkeeping records are the other causes. Each of these is discussed and examples given.—PAUL C. OLSEN. *J. Am. Pharm. Assoc.*, 27 (1938), 73. (Z. M. C.)

Professional Pharmacy—Voice of. The author points out how the silent voice speaks louder than the audible one. He traces the effect of a prescription, makes suggestions for a professional window, the other professional departments that may profit by display, some of the means of making contacts with other professions.—MARVIN J. ANDREWS. *J. Am. Pharm. Assoc.*, 27 (1938), 53. (Z. M. C.)

Should the Certificate of "Qualified Assistant" Be Given by the Pharmacy Boards after 1937? Some phases of the question of having assistant pharmacists are discussed, particularly whether recent trends in some states have not increased the need for them.—ERNEST LITTLE. *J. Am. Pharm. Assoc.*, 27 (1938), 237. (Z. M. C.)

Taxation Vertical *vs.* Horizontal. Taxation methods are discussed with the conclusion that the fairest method would be a sales tax based on the retail price of all consumable commodities, the tax to be applied in most instances at the manufacturing source. Future support of government should embrace the following points: elimination of the vertical drag on turnover; horizontal application of a sales tax on consumable commodities, including housing; coördination of federal, state and local tax systems.—JAMES C. CARSTATER. *J. Am. Pharm. Assoc.*, 26 (1937), 1256. (Z. M. C.)

MISCELLANEOUS

Cosmetic Soaps—Newer. A discussion on the constituents of the modern cosmetic soaps, soaps containing vitamin F, and the preparation of soaps to be used for shampooing normal hair.—JOSEF AUGUSTIN. *Seifensieder-Ztg.*, 64; *Der Parfümeur*, 11 (1937), 575–577. (N. L.)

Cosmetics—Cautionary Comments on. Certain possible dangers which may arise from the use of lipsticks, face creams, hair dyes, face powders and lotions, nail preparations, depilatories and grease paints are discussed.—CHIEF MEDICAL OFFICER OF THE MINISTRY OF HEALTH. *Perfumery Essent. Oil Rec.*, 28 (1937), 448. (A. C. DeD.)

Cosmetics—Cholesterol in. A series of suggested formulæ showing typical uses of cholesterol in cosmetics and complete instructions are given for analyzing both cholesterol and lecithin.—ANON. *Am. J. Pharm.*, 110 (1938), 194. (A. C. DeD.)

Face Powders—New. The outstanding advances in face powder manufacture are (1) precipitated powders, (2) color coating each particle, (3) inclusion of 5 to 15% of powder base, such as zinc and magnesium undecylates, to give adhesion, and slip of product and bloom to the complexion. They are non-toxic and non-irritating and can be added to any formula to improve it. The use of precipitated powders renders greater homogeneity. Particles do not exceed 10 microns; the grittiness as indicated by the "bite test" is 12 microns.—M. C. DENAVARRE and R. J. MARCH. *Am. Perfumer*, 36 (1938), 33–34. (G. W. F.)

Glass Ampuls—Testing. A minute liberation of alkali is essential as it may cause a precipitation of alkaloids. Ten standard methods of testing, including those of the principal pharmacopœias of the world, were compared on three commercial glasses. The Deuts. Glastechn. Ges. method on powdered glass is regarded as the most reliable, but is rather slow. Mylius'

extraction method is unreliable; most boiling methods are inconvenient, but the methods of the German and particularly the English pharmacopœias are satisfactory. In the latter the liquid may be titrated with 0.01*N* sodium hydroxide from a micro-burette.—O. KNAPP. *Keram. Rundschau*, 45 (1937), 589–590, 600–603; through *J. Soc. Chem. Ind.*, 57 (1938), 371. (E. G. V.)

Hard Soaps—Preparation of. For household soaps, the classical boiling and settling process is too cumbrous, time-consuming and wasteful of glycerin, and is unnecessary. They do not require to contain greater than 50% of fatty acids, and should be made by neutralizing good-quality split fatty acids with concentrated sodium hydroxide, and milling the made soap with useful fillers, such as sodium carbonate, silicate, Calgon, solvents, Zewa powder, etc., to yield stable blocks.—R. KRINGS. *Seifens.-Ztg.*, 64 (1937), 841–843; through *J. Soc. Chem. Ind.*, 57 (1938), 296. (E. G. V.)

Insecticides—Volatility and Rate of Evaporation of. For use as fumigants carbon tetrachloride and benzene possess suitable volatility at ordinary temperature. Substances with boiling point 120–180° can be used only at high temperature.—I. OKUNEVSKI and V. CHACHAEVA. *Med. Parasitol. Parasit. Diss.* (Moscow), 3 (1934), 82–91; through *J. Soc. Chem. Ind.*, 57 (1938), 426. (E. G. V.)

Jasmin Compositions. A review of jasmin compositions, ancient and modern, with formulæ.—SEN-GUPTA, JR. *Indian Soap J.*, 4 (1937), 129; through *Am. Perfumer*, 36 (1938), 70. (G. W. F.)

Liquid Soaps—Preparation of. The usual method of saponifying the fatty acids with concentrated potassium hydroxide and then dissolving the soap in water is time consuming and troublesome; excellent results are obtained by mixing the acids with a boiling lye containing, *e. g.*, one-third of the total amount of water to be used, a fully saponified thin soap being obtained which can easily be diluted. The use of a little potassium carbonate to "reduce" the lye is preferable to potassium chloride. Tylose is a good filler, and reduces the irritant effect of coconut oil soaps.—ANON. *Seifens. Ztg.*, 64 (1937), 980–981; through *J. Soc. Chem. Ind.*, 57 (1938), 296. (E. G. V.)

Manufacturers' Problems—Cosmetic. A discussion of some of the major problems connected with the splitting of creams, matching of products, inclusion of incompatibles, quality of lipsticks, clarity of shampoos, etc.—S. P. JANNAWAY. *Perfumery Essent. Oil Rec.*, 29 (1938), 162. (A. C. DeD.)

McDonald's Solution—New. A new solution is described for use in conjunction with soap in cleansing the surgeon's hands and in the pre-operative preparation of patients. It consists of 2 parts of sodium *o*-xenolate, 8 parts of sodium oleate, 400 parts of acetone and 600 parts of 95% alcohol. One part of the solution is used in 30 parts of water. The solution dissolves the fat in the skin, allows the penetration of the sweat glands, etc. It is not neutralized by organic matter or soap. Sodium *o*-xenolate has a phenol coefficient of 18 against the typhoid bacillus.—ELLICE MCDONALD. *Surg. Gynecol. Obstet.*, 66 (1938), 246; through *Squibb Abstr. Bull.*, 11 (1938), A-401. (F. J. S.)

Soap—Effect of Impurities on. Salt is an objectionable impurity in caustic soda if present to more than 2%. Salt makes soap more brittle, but improves color, hardness and keeping qualities. Iron, present to more than 25 p. p. m., causes spotting and promotes rancidity. The quality of wood rosin employed is important. The following is an analysis of a good soap rosin: m. p. 175.5° F., acid number 163.4, unsaponifiables 7.3%, petroleum ether insoluble 0.15%, gasoline insoluble 0.06%, color (Lovibond scale 40 amber 4.00 red), saponification number 171.1, specific rotation 2.0, ash 0.008. Silicates may contain objectionable impurities such as iron, alumina, calcium hydrate and sodium chloride; they should be subjected to frequent analysis.—P. I. SMITH. *Am. Perfumer*, 36 (1938), 47. (G. W. F.)

Soap—Starch as Filler for. Starch has been employed as a filler for soap up to 20%. The beneficial action is attributed to the colloidal character of soap.—P. I. SMITH. *Am. Perfumer*, 36 (1938), 40. (G. W. F.)

Soaps Containing Silver. Methods of incorporating active silver are reviewed; the finest possible state of division and even distribution of the silver or of its difficultly soluble derivatives are important in order to obtain good disinfecting power without discoloration.—A. FOULON. *Seifens-Ztg.*, 65 (1938), 92–93; through *J. Soc. Chem. Ind.*, 57 (1938), 404. (E. G. V.)

Sodium Soap—Properties of, Prepared with Hardened Oils. Oils from soy bean, rice soy and chrysalide, having iodine values of approximately 70, give toilet and laundry soaps with properties similar to those of tallow soap, although their turbidity points are lower. Hardened fish oils (iodine values 60–65), if mixed in a suitable amount with other fats and oils, can be used without producing any disagreeable effect.—Y. KAWAKAMI. *J. Electrochem. Assoc. Japan*, 3 (1935), 389–394; through *J. Soc. Chem. Ind.*, 57 (1938), 404. (E. G. V.)

Solvent Extraction—Past and Future. Modern continuous oil-extraction processes, employing suitable solvents, yield high grade oils and meals, and offer considerable economic advantages in large scale working as well as a saving of oil otherwise lost in press-cakes.—M. BONOTTO. *Oil and Soap*, 14 (1937), 310–311; through *J. Soc. Chem. Ind.*, 57 (1938), 294. (E. G. V.)

Spermaceti and Cetyl Alcohol in Cosmetics. Whereas spermaceti is supposed to have no effect on the skin and is used chiefly for making cremes more compact and for improving their appearance, cetyl alcohol exerts a valuable action on the skin. It is easily resorbed, promotes the absorption of other fats, does not show an irritating effect, renders the skin soft and does not become rancid. It is used as an emulsifying agent either alone or in mixture with other aliphatic alcohols. The usual amount of cetyl alcohol in different cosmetics is given.—B. FILMER. *Fette u. Seifen*, 45 (1938), 105; through *Squibb Abstr. Bull.*, 11 (1938), A-484. (F. J. S.)

Starch Substances—Adhesive. Starch adhesives are improved by adding carboxylic acid salts or cellulose aralkyl or alkyl ethers, *e. g.*, carboxylic acids of cellulose benzyl- or hydroxybenzyl ether or cellulose-glycollic (I) or lactic acid as their potassium, sodium or $N(C_2H_4.OH)_3$ salts. In the example, the sodium salt of I (from cellulose and $CH_2Cl.CO_2OH$) is mixed with an equal weight of a swellable starch, from which a paste is made.—ANON. Brit. pat., 478,299; through *J. Soc. Chem. Ind.*, 57 (1938), 429. (E. G. V.)

Sulfo-Ricinoleate as a Tartar Remover for the Teeth. A brief review of the cause of tartar formation on the teeth and the therapeutic action of the sulfo-ricinoleate compound as a valuable agent in the removal of tartar.—ANON. *Pharm. Ztg.*, 82 (1937), 863–864. (N. L.)

Suntan and Sunburn. The products available for use may conveniently be divided into three groups: (1) Those designed to encourage suntan and prevent sunburn, depending on oils or on ray filters which may be incorporated in oily or spirituous media; (2) those giving results simulating suntan; (3) those which relieve sunburn. Oily preparations were probably the first to be used. Vegetable oils are well-known stimulants of suntan, mineral oils being much less effective. Almond, arachis, olive and sesame oils are the most popular, but are frequently mixed with mineral oils in order to lower the price of the final product. All that is necessary in the preparation of a simple suntan oil is that the oil should be very lightly perfumed and if necessary have an oil-soluble suntan color dissolved in it. A preservative may be desirable, in which case a parahydroxybenzoic acid derivative is suitable. If an oil-soluble ray filter is also incorporated in the oil a very efficient anti-sunburn preparation is produced. Several formulæ are given.—ANON. *Chemist and Druggist*, 128 (1938), 399. (A. C. DeD.)

Synthetics—Uses of, in Perfumery. Both quinoline and tetrahydro quinoline derivatives are available for experiment to the perfumer. The best known quinoline derivatives are the methyl quinolines. Three isomeric methyl quinolines have been used in perfumery. The para-methyl quinoline has a powerful, smoky unpleasant odor, which becomes distinctly honey-like on dilution. The meta-methyl quinoline is slightly more floral in character, having a lilac odor. The alpha-methyl quinoline also known as "quinaldine" possesses a characteristic lilac odor. Iso-butyl quinoline is usually suggested as a base for artificial oak moss. Tetra-hydro quinoline is a crystalline solid of low melting point. Possesses the honey-civet type of odor often and is less pronounced than its para-methyl derivative, which it resembles. A number of miscellaneous chemical products are also discussed.—M. L. HEWITT. *Perfumery Essent. Oil Rec.*, 28 (1937), 250. (A. C. DeD.)

Vitamin Creams. Vitamin D when used in skin creams is either in a standardized oil or a vegetable oil. Emulsifying agents are necessary, and the best are those which can be used at the lowest temperatures. Cholesterin is excellent since it operates at low temperatures and it is itself a substance having a beneficial effect on the skin. A formula resulting in a satisfactory product is given. Creams containing vitamin A are met with, but as carotene is the usual vitamin A constituent, and the precursor is understood to exert its effect only after passing through the liver,

the value of the vitamin may be doubted. Preserved lemon juice is generally employed as the source of vitamin C, and the main point to watch is that the emulsifying agent is compatible with acids. Cetyl alcohol and its derivatives are suitable.—ANON. *Chemist and Druggist*, 128 (1938), 238. (A. C. DeD.)

Vitamin F in Cosmetics. Vitamin F is used in the preparation of face creams, preparations for the hair and manicure preparations. Each type of preparation is discussed and typical formulæ given for each.—ANON. *Chemist and Druggist*, 128 (1938), 679. (A. C. DeD.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Acetylcholine—Bronchiolar Effects of, after Atropine and Ergotamine. It is shown that in the pithed cat or dog, previously, injected with atropine and ergotamine, both acetylcholine and adrenaline lead to bronchodilation. The acetylcholine effect is abolished by removal of the suprarenal, but the response to adrenaline is not affected. These findings support the hypothesis of Houssay and Orias, namely, that the bronchiodilation produced by acetylcholine in the atropinized animal is due to an action of acetylcholine upon the suprarenals leading to a liberation of adrenaline.—K. I. MELVILLE. *Arch. intern. pharmacodynamie*, 58 (1938), 139. (W. H. H.)

Adonis Vernalis—Preliminary Note on the Biological Assay of. Biological assay of the glucosides of *Adonis vernalis* by the Hatcher-Magnus method, which consists in injecting continuously into the femoral vein of a chloralized dog a dilute solution of the glucosides (the rate of injection being regulated to produce death in about 30 minutes), gave the following minimum lethal doses: 0.5 to 0.75 mg. of adonidoside and 1.25 mg. of adonivernoside per kilo body weight. Certain investigators, using the same method and the same test animal, obtained somewhat different results: 0.4 mg. and 0.97 mg., respectively. This divergence is probably due to a difference in the time of continuous injection. The length of time of injection should be specified when reporting minimum lethal doses.—F. MERCIER and MELLE. S. MACARY. *Compt. rend. soc. biol.*, 124 (1937), 459–463; through *Chimie & Industrie*, 38 (1937), 870. (A. P.-C.)

Adrenaline Oxidation—Cocaine as a Restaining Substance, Ergotamine as a Hastening Substance of, in Vitro. The adrenaline oxidation induced through tyrosine fermentation will be accelerated by acetaldehyde just as the autoöxidation of the dioxyphenylalanines; cocaine checks this action. Ergotamine as well as the Forneau substances F. 933 and F. 883 helps the adrenaline inactivation in the presence of acetaldehyde. Ergotamine also accelerates the fermentative oxidation of adrenaline.—G. BAYER and T. WENSE. *Arch. intern. Pharmacodynamie*, 58 (1938), 103. (W. H. H.)

Amino Alcohols—Monoalkylated, Local Anesthetic Actions of Two Esters of. The toxicity and anesthetic efficiency of two esters of mono alkalated amino alcohols, monocaine and amylcaine, were determined upon a number of different test animals. It was found that monocaine was a very effective compound in producing infiltration and conduction anesthesia. Although it was about one and one-half times as toxic as procaine, its anesthetic efficiency was many times greater. It was able to produce sciatic nerve block in the non-anesthetized guinea pig in concentrations as low as $^1/_{64}\%$. Amylcaine, although also capable of producing nerve block in low concentrations, appeared to be more efficient in effecting anesthesia when applied topically, as to the cornea of the rabbit's eye. The presence of erosions following the administration of this compound was less frequent than in the case of the other anesthetics.—DAVID I. ABRAMSON and SAMUEL D. GOLDBERG. *J. Pharmacol.*, 62 (1938), 69. (H. B. H.)

Androsterone Group—Action of Different Compounds of, on the Genital Organs of the Chick Embryo. Androsterone, testosterone acetate and 17-methylandrosten-17-ol-3-one all have the same action on the genital tract of the chick embryo. They partially feminize the males and partially masculinize the females. The last-mentioned compound is 4 to 7 times as active as androsterone in stimulating the growth of the capon comb and the prostate and seminal vesicles of the castrated rat, but it is only 1.5 to 2.0 times as active as androsterone in its effect on the chick embryo. Testosterone acetate has 6 times the activity of androsterone on the capon comb and 10 times the activity of androsterone in the case of the seminal vesicles of the rat, but has about half the activity of androsterone in the chick embryo.—E. WOLFF and EMILIENNE WOLFF. *Compt. rend. soc. biol.*, 124 (1937), 367–369; through *Chimie & Industrie*, 38 (1937), 1145. (A. P.-C.)

Antipyretics—Anti-Oxidative Properties of. The effect of several antipyretic substances was tested upon (1) the oxidation of ferrous sulfate, (2) the auto-oxidation of benzaldehyde and (3) the decoloration of methylene blue by liver tissue. The results were variable, but it is concluded that the antipyretics tested showed in general some anti-oxidant power.—A. BOUTARIC and J. A. GAUTIER. *Bull. soc. chim. biol.*, Paris, 19 (1937), 938; through *Physiol. Abstr.*, 22 (1937), 1098. (F. J. S.)

Antipyretics and Caffeine—Influence of, upon Sedative Effects. The influence of hypnotics, antipyretics and caffeine, and a mixture of these substances upon the spontaneous activity of white mice was examined by the method of Druckrey and Köhler. Great individual differences were observed in the reaction to hypnotics. Caffeine (5 mg. per Kg.) completely abolished the hypnotic effect of 300 mg. per Kg. bromdiethylacetylcarbamide and caused about the same excitement as when given alone. The sedative effect of bromide was also annulled by caffeine.—H. DRUCKREY, E. MÜLLER and M. STUHLMANN. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 221; through *Physiol. Abstr.*, 22 (1937), 1101. (F. J. S.)

Autonomic Drugs and the Biliary System. I. The Action of Acetyl-β-Methyl Choline Chloride (Mecholyl) and Benzyl Methyl Carbinamine Sulfate (Benzedrine Sulfate) on the Gall Bladder. The subcutaneous administration of acetyl-β-methyl choline chloride (mecholyl) to cats is followed by contraction of the gall bladder. Benzyl methyl carbinamine sulfate (benzedrine sulfate) when similarly administered causes relaxation of the gall bladder.—JAMES FLEXNER, MAURICE BRUGER and IRVING S. WRIGHT. *J. Pharmacol.*, 62 (1938), 174. (H. B. H.)

Bee Venom. III. Separation of the Venom into Two Components. The partially purified venom (fraction soluble in 60% alcohol) was dissolved in very dilute formic acid and dialyzed against distilled water. About 40% passed through the membrane. This fraction produced severe convulsions and death when injected into mice. Solutions adjusted to p_H 3.6 and 12.6 were completely detoxified by heating 2 hours at 100° C. The nondialyzable fraction contained the neurotoxin. When it was injected into mice they died of respiratory paralysis without any convulsions. It was not inactivated when a solution acidified to p_H 4 with formic acid was heated for 2 hours at 100° C. Picric acid precipitates both constituents in aqueous solution.—G. HAHN and H. DEDITSCHKE. *Ber. Deut. Chem. Ges.*, 70 (1937), 681–684; through *Chimie & Industrie*, 38 (1937), 737. (A. P.-C.)

Cardiazol, Coramine, Hexetone, Strychnine and Icoral—Antinarcotic Action of. The antagonistic effect of different analeptics was examined in dogs narcotized with evipan, medinal, pernocton, eunarkon and chloral hydrate. The greatest antinarcotic effect was caused by cardiazol and icoral, less by strychnine and hexetone, and least by coramine. Cardiazol only had a quick and lasting antagonistic effect upon medinal narcosis, whereas coramine increased the toxicity of medinal. The M. L. D. of pernocton and evipan was estimated when injected in combination with the analeptics in question. The M. L. D. of pernocton and evipan was increased by cardiazol, icoral, strychnine and camphor. Hexetone caused increase of the M. L. D. of evipan, but decrease of the M. L. D. of pernocton. Coramine in large doses decreased the M. L. D. of pernocton, but slightly increased the M. L. D. of evipan.—K. ZIPF, W. A. WINDSCHUS and F. KOKOSCHKA. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 113; through *Physiol. Abstr.*, 22 (1937), 1100. (F. J. S.)

Carnitine and Acetylcarnitine—Biological Action of. With mouse intestine, up to 0.05% of carnitine or acetylcarnitine has no effect, while 0.25–1% causes relaxation. With frog's rectus and leech muscle, 100 mg. of carnitine acting for 45 minutes has only the same effect as 3μ g. of acetylcholine acting for 3 minutes. Acetylcarnitine is only $^2/_3$ as active as carnitine with these two types of muscle. With frog's heart carnitine and acetylcarnitine have the same activity, but are 50 and 5 × 10^5 times less active than choline and acetylcholine, respectively. Atropine does not inhibit the action of carnitine, which is frequently accompanied by choline and difficult to separate from it, and such impure carnitine may show, especially after acetylation, considerable activity. Carnitine and acetylcarnitine affect the heart beat of warm-blooded animals in the same way as of frog's heart.—E. STRACK and K. FÖRSTERLING. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 612; through *Physiol. Abstr.*, 22 (1937), 1103. (F. J. S.)

Choline—Pharmacological Action of Three Derivatives of. Acetyl-β-methylcholine (A), β-methylcholine ethyl ether (B) and β-ethylcholine (C) have a hypotensive action which is, respectively, 20, 2 and 10 times that of acetylcholine. The heart-slowing action of A, and to a less

extent that of B and C, is much more prolonged than that of acetylcholine. Atropine suppresses or inverts the hypotensive action of B and C and suppresses the action of small, but not large, doses of A. All three are intense excitants of the reflexogenic chemosensitive receptors of the carotid sinus.—M. DE WISPELAERE. *Compt. rend. soc. biol.*, 124 (1937), 276–279; through *Chimie & Industrie*, 39 (1938), 121. (A. P.-C.)

Choline Esterase of the Brain—Action of Members of Morphine Series and Emetine on. The inhibitory action of seven members of the morphine series and emetine on the choline esterase of the brain has been studied. The inhibition is a function of the amount of drug present and the amount of acetylcholine hydrolyzed. It is somewhat dependent on the hydrogen-ion concentration being less at p_H 6.7 than at p_H 7.8. It is independent of the length of time the drug and enzyme are incubated together before the addition of the acetylcholine. In general it can be stated that the greater the central emetic action of the drug the greater the inhibition of the brain choline esterase.—H. H. KUHN and D. SURLES. *Arch. intern. Pharmacodynamie*, 58 (1938), 88. (W. H. H.)

Cinchona—Pharmacology of Antimalarial Medication with, and Its Substitute Synthetic Alkaloids. A comprehensive review of the literature.—J. GOLSE. *Bull. soc. pharm. Bordeaux*, 76 (1938), 16–41. (S. W. G.)

Crystalline Substance from Liver—Active, Identification of, Which Protects against Liver Damage Due to Chloroform or Carbon Tetrachloride; and a Study of Related Compounds. The crystalline substance from liver extract which acts as a protective agent against the liver changes due to chloroform or carbon tetrachloride poisoning has been purified and identified as sodium xanthine. The injection of sodium xanthine prepared synthetically gave the same protective activity as did the crystalline preparation from liver. Other purine substances including nucleic acid, guanosine, guanine and hypoxanthine, also were found to be protective agents. Experimental results showed adenine to be very toxic, giving unsatisfactory results. Uric acid offered a slight protection. The medicinal methyl derivatives of xanthine could be tolerated by the rat only in comparatively small doses due to their pharmacological action. The imidazole portion of the xanthine molecule, as represented by both histidine and imidazole itself, were inactive as protective agents. The pyrimidine portion of the xanthine molecule, as represented by utacil offered a very definite protective action, although somewhat different from that afforded by xanthine, or its sodium salt. Purine oxidation products, allantoin and alloxan, increased the liver damage due to carbon tetrachloride or chloroform.—R. C. NEALE and H. C. WINTER. *J. Pharmacol.*, 62 (1938), 127. (H. B. H.)

Curarine—Action of, on Respiration. Curarine and some curares may produce a dangerous respiratory spasm. Sudden inspiratory dyspnoea occurs, breathing may be arrested, and difficulty of artificial respiration by chest compression and by endotracheal oxygenation suggested the presence of bronchial spasm. In a case of acute tetanus treated with curarine, collapse of the lung was found on autopsy. Animal experiments show that curarine can in fact exert a direct constrictor action on the bronchi and that the effects of this are increased by partial curarization of the respiratory muscles. Not only is the partly curarized diaphragm weakened in its inspiratory contraction, but its resting tone falls; it rises into the chest cavity, and, in consequence, the "negative" intrapleural pressure falls. The result is a reduction of the bronchodilator action of the normal distributions of pressure within the chest cavity, in expiration and inspiration. Curarine is probably not a pure substance. A purely curarizing alkaloid—perhaps to be found in "toxiferin"—by lacking the direct bronchoconstrictor might increase a margin of safety in curare therapy, which in the case of curarine is too small to justify its employment.—R. WEST. *Lancet*, 234 (1938), 432. (W. H. H.)

Cyclopropane—Homologues of. II. Anesthetic Properties of Methyl Cyclopropane. Reference is made to the work that has been done on cyclopropane anesthesia in monkeys. Heart and respiratory rates are depressed. Mean values for three monkeys are collected into a table. The same three monkeys were used subjected to two anesthesias with methyl cyclopropane and heart rate and respiratory rate are again tabulated. Findings are compared with effects of cyclopropane. Effective concentrations and lethal concentrations for both and the margins of safety for both are about the same but methyl cyclopropane does not compare favorably with cyclopropane in a qualitative and quantitative comparison of their several side effects.—L. F. SHACKELL. *J. Am. Pharm. Assoc.*, 27 (1938), 128. (Z. M. C.)

Deuterium Oxide—Pharmacological Action of. IV. The Sympathomimetic Action of Deuterium Oxide in Mice. Deuterium oxide in dosage, leading promptly to about one-fifth saturation of the body water, produces persistent indications of sympathomimetic action in mice especially exophthalmos and a pilomotor reaction involving the whole body surface and the vibrissæ. These effects may be imitated by injection of epinephrine in doses of about 0.1 mg. or by exciting the animal, but the heavy water effect is of much greater duration. As with epinephrine the above effects of deuterium oxide may be abolished by ergotization. The above and other recent experimental evidence indicates that deuterium oxide protects sympathetic hormones, delaying their disappearance from the body. Deuterium oxide potentiates strikingly the lethal convulsive action of large doses of ergotoxine.—HENRY G. BARBOUR and JULIAN B. HERMANN. *J. Pharmacol.*, 62 (1938), 158. (H. B. H.)

1-Diethylamino-2-Phenoxyethane—Analeptic Action of, and Antagonism with Barbituric Acids. The convulsant action of 1-diethylamino-2-phenoxyethane (F. 928) in guinea pigs was inhibited by ethobutylethylbarbituric acid (Narcosol), gardenal, evipan and 5-ethyl-5-ethylbutyl-thiobarbituric acid (F. 1187). It is proposed that antiepileptic drugs (hypnotics) be assayed on guinea pigs weighing 400 to 500 Gm. after they have been thrown into convulsions by 35 to 40 mg. of F. 928. No antagonism was observed between the barbiturates and the antipyretic action of F. 928. Properties similar to those of F. 928 were exhibited by the phenolic ether of diethylaminoethanethiol (F. 1259). An electrocardiogram taken during a convulsion due to F. 928 showed no abnormality other than a decreased rate. Certain conditioned reflexes disappeared shortly before the initiation of convulsions due to F. 928. When narcosol was given with F. 928, these reflexes were not lost. Artificial fever due to foreign proteins did not inhibit F. 928-convulsions. The hypnotic effects of evipan and the toxicity of narcosol were decreased by F. 928.—J. SIVADJIAN. *Compt. rend. soc. biol.*, 124 (1937), 1066–1068; through *Chimie & Industrie*, 38 (1937), 736. (A. P.-C.)

Digitalis—Pressor and Other Effects of Antipyretics on. Antipyrine markedly decreases the lethal dose of digitalis. It also causes an extreme rise in blood pressure, similar to other antipyretics if combined with digitalis. Neither of these drugs alone produces a notable rise.—ROBERT A. MCGUIGAN. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 314. (A. E. M.)

Digitalis Derivatives—Destruction of, by Gastric Juice. I. Diginalid, 2% infusion of digitalis, and digitoxine (Merck), after incubation with hydrochloric acid, pepsin, or with normal and boiled gastric juice, were titrated in cats by the Hatcher-Magnus method. The digitalis substances were destroyed by gastric juice and by hydrochloric acid to a degree dependent on the p_H, the time of action and the varying resistance of the single substances. The decrease in the activity of the substances was greater when they were incubated with an ultra-filtered or boiled gastric juice than when incubated with a native gastric juice. This was due to the protecting colloids present in the normal gastric juice.—F. SVEC. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 57; through *Physiol. Abstr.*, 22 (1937), 1100. (F. J. S.)

Digitalis Glucosides—Influence of, on the Force of Contraction of Mammalian Cardiac Muscle. A preparation is described, consisting of the isolated papillary muscle from the cat, which affords satisfactory material for the study of the action of drugs on mammalian cardiac muscle. The digitalis glucosides, ouabain, digitoxin, in concentrations approximating those obtaining in the body following the administration of therapeutic quantities of these drugs, bring about a several-fold increase in systolic tension. There is thus demonstrated a direct action of digitalis bodies in increasing the force of cardiac muscle, independent of any effects which might be mediated through other influences on the intact heart. Shortening of the muscle fiber (decrease in diastolic size) is not essential to the explanation of the action of digitalis in increasing the force of contraction of the failing mammalian heart.—MCKEEN CATTELL and HARRY GOLD. *J. Pharmacol.*, 62 (1938), 116. (H. B. H.)

Digitalis and Strophanthin—Effect of Therapeutic Doses of, upon the Cat's Heart Poisoned by Diphtheria. The efficiency of the heart and effect of therapeutic doses of digitalis and strophanthin were studied in Starling's heart-lung preparations of cats poisoned with diphtheria toxin. The hearts of poisoned cats were less efficient than normal. The endurance was sometimes increased by prophylactic administration of digitalis but disturbances of conduction were caused in more than half of the cases. Small doses of strophanthin (1:200,000) increased the efficiency of the poisoned hearts when given at the point of maximum insufficiency.—J. DIECKHOFF

and E. SCHULZE. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 418; through *Physiol. Abstr.*, 22 (1937), 1103. (F. J. S.)

Drugs and Poisons—Absorption of, through the Skin and Mucous Membranes. Experiments with ointments and lotions prepared with fixed fats and oils—petrolatum, lanolin, lard, olive oil and linseed and cottonseed oils, etc.—indicate that none of these facilitates the absorption through the normal skin of drugs incorporated in them. Lanolin was a more effective vehicle than other members of this series. A large group of essential or volatile oils, official and non-official, was readily absorbed through the intact skin of various animals, as indicated by physiological and biochemical reactions occurring after their application. Many pure chemical constituents, obtained from volatile oils or synthetically prepared and examined with respect to their penetration of the integument, were found to be rapidly absorbed through the normal skin. A number of volatile oils and some of their constituents were successfully employed as vehicles for introducing into the body several potent alkaloids and other drugs. Toxicological experiments with nicotine revealed that the alkaloid is rapidly absorbed through both the mucous membranes and the intact skin. Advantage was taken of this toxicological property of the drug in investigating its penetration through diseased and pathological mucous membranes and skin as compared with normal surfaces of the body. The significance of these findings and their bearing on pharmacological and pathological problems as well as on clinical diagnosis and therapeutics, have been pointed out.—D. I. MACHT. *Arch. intern. Pharmacodynamie*, 58 (1938), 1. (W. H. H.)

Ergotamine and F. 933—Sympathomimetic Reactions in the Bronchioles after. The effects of adrenaline and arterenol upon the bronchioles and blood pressure were compared in cats and dogs after administration of either ergotamine or bensodioxane compound F. 933. Both adrenaline and arterenol can be shown to dilate the bronchioles in animals previously injected with ergotamine. On the other hand, after F. 933 neither of these agents shows any effect upon the bronchioles. The data presented suggest that the bronchiolar sympathetic reactions are quite different from those observed in the vascular system, both quantitatively and qualitatively. Ergotamine appears to render the bronchioles more sensitive to adrenaline and arterenol, while the F. 933 leads to no demonstrable effect upon the response to these agents.—K. I. MELVILLE. *Arch. Intern. Pharmacodynamie*, 58 (1938), 129. (W. H. H.)

Erythrophleum—Pharmacological Studies on the New Alkaloids Isolated from, from Guinea and from Madagascar. II. The minimum lethal dose in mg. per kilo and in Gm.—mol. per kilo were determined subcutaneously, intravenously and orally in the rabbit. The results are tabulated. In regard to the toxicity in the various animals and for the various modes of administration, it increases progressively in the following order: nor-cassaidine, cassaine, homophleine, erythrophleine, Madagascar. The only exceptions are cassaine in the frog which is much less toxic than the other alkaloids and Madagascar by the gastric route in the rabbit is less toxic than erythrophleine and homophleine. As to the general symptomatology, nor-cassaidine, homophleine, erythrophleine and Madagascar produce prevalently depressive phenomena while cassaine produces intense excitation phenomena so that this alkaloid can easily be differentiated from the others. A marked diminution in toxicity was observed in all the alkaloids when administered gastrically.—R. SANTI and B. ZWEIFEL. *Boll. soc. ital. biol. sper.*, 11 (1936), 760–762; through *Chimie & Industry*, 38 (1937), 1140. (A. P.-C.)

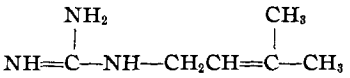
Erythrophleum Alkaloids—Potency of. Brief historical reference is made to these alkaloids and experimental work reported at some length with tabulations of results of tests. The authors summarize their findings as follows: The potency of five natural cardiac Erythrophleum alkaloids and one derivative—coumingine, coumingaine, nor-cassaidine, homophleine, cassaine and acetylcassaine—has been carefully determined in cats and frogs. Coumingine hydrochloride is the most potent member; its cat unit is approximately the same as that of scillaren A. The remaining new alkaloids, coumingaine, cassaine, nor-cassaidine and homophleine, are less potent than the older substance erythrophleine. The emetic action of coumingine, coumingaine, cassaine, nor-cassaidine and homophleine is relatively more powerful than that of erythrophleine. Acetyl-cassaine is less potent on the heart than cassaine, but slightly more effective in causing vomiting, Gm. for Gm. All the newer alkaloids have a local anesthetic action upon the rabbit's cornea and the guinea pig's skin. They are bitter to the taste and produce numbness and parasthesia of the tongue in men by local application. Their irritating effects and predominant cardiac action preclude their clinical usefulness. Like other cardiac substances, the newer Erythro-

phleum alkaloids raise blood pressure in cats, and stimulate isolated rabbits' intestines and guinea pigs' uteri. Cassaine in addition causes convulsions in frogs and cats.—K. K. CHEN, CHESTER C. HARGREAVES and WILLIAM T. WINCHESTER. *J. Am. Pharm. Assoc.*, 27 (1938), 9.

(Z. M. C.)

Fluidextract of Gelsemium—Cardiovascular Action of. With the dog, the fluidextract of *Gelsemium sempervirens* produces in small doses some tachycardia by diminution of the vagal tonus and diminishes the auriculoventricular amplitude; in large doses, the diminution of the amplitude persists and is accompanied by bradycardia by depressive action on the myocardium; death takes place by stoppage or ventricular fibrillation. On the carotid pressure, in small doses it is either without effect or hypotensive, the hypotension being in that case after the renal vasoconstriction and limited to this territory. In large doses, it always exercises a hypotensive action together with a diminishment in the volume of urine. In small doses, it diminished the tonus of the vagus; in larger doses, the pneumogastric excitability diminishes and the sinocarotid reflex by mechanical stimulation disappears. The cardiovascular modifications indicated above are caused by a depressive cardiac action and no respiratory.—RAYMOND CAHEN and E. MOISSET DE ESPANES. *Compt. rend.*, 206 (1938), 280. (G. W. H.)

Goat's Rue (Galega Officinalis) as a Medicinal Plant. Goat's rue has been used in the treatment of diabetes for many years. Its active ingredient is the alkaloid, galegin, which has been shown to be isoamyleneguanidine, having the formula,



In addition to its physiological effect of lowering the blood-sugar level, galegin also possesses a galactogue action. The drug itself is dispensed in the forms of a fluidextract and as a 10% infusion.—N. STIRNADEL. *Hippokrates* (1937), 742; through *Pharm. Ztg.*, 82 (1937), 869–870.

(N. L.)

Heart Drugs—Two New, Found in Experiment. Two new drugs for the treatment of heart disease, which are 20 times as safe in relation to effectiveness as any previously known, have just been found, according to an announcement by V. The drugs were found during tests of 100 drugs in a study in which an animal's heart and lung were kept alive 24 hours after removal from the body in order to observe cardiac energy input and output. Names of the drugs are being kept secret until clinical tests confirm the experimental findings. They belong to the same group as digitalis, having a phenanthrene nucleus.—MAURICE G. VISSCHER. *Science News Letter*, 33 (1938), 137; through *Squibb Abstr. Bull.*, 11 (1938), A-501. (F. J. S.)

Hydrocupreine and Hydrocupreidine—Action of, on Fibrillation. Hydrocupreine has no action on electrical fibrillation of the heart and its after-effect; heterotropic rhythms are not influenced by it; conduction and refractory period remain unaltered. Hydrocupreidine raises the resistance against electrical fibrillation, the after-effect always disappears; the action is independent of the extracardial nerves; heterotopic rhythms are completely suppressed by the minimal active dose (0.5 mg. per Kg.); in this dose the refractory period and conduction are unaltered; these qualities are both lengthened in five to six times this dose. The action of different quinine derivatives on fibrillation is compared and discussed.—K. VAN DONGEN. *Arch. Intern. Pharmacodynamie*, 58 (1938), 193. (W. H. H.)

Hypertensive Agent—New. The author recommends the use of a new preparation—pressyl—for the treatment of hypotension before, during and after operation, and particularly in spinal analgesia. It is a combination of camphramine, or beta-diethylcarbonamide of camphosulfonyl-N-methylpyridine, a cardiac and respiratory stimulant, and of pressedrine, or alpha-aminophenylethylcarbinol sulfate, whose action resembles that of adrenaline and ephedrine. Pressyl may be administered orally, subcutaneously or, in emergency, intravenously. It elicits a rise of blood pressure as great as that caused by adrenaline, though not quite so rapidly, while its effect lasts about twice as long as that of ephedrine.—E. DESMAREST. *Anesthésie et analgésie* (June 1937), 391; through *Brit. Med. J.*, 4013 (1937), 1152C. (W. H. H.)

Insulin—Action of Hydrochloric Acid on. Addition of hydrochloric acid to solutions of insulin at 5° C., produces a precipitate, $^1/_{20}$ mg. of which, corresponds in activity to one international unit. This is in contrast to the "heat precipitate" studied by Du Vigneaud and coworkers (*J. Biol. Chem.*, 102 (1933), 521). These facts tend to prove that in insulin the part of

the molecule responsible for the precipitability by heat is not identical to that which conditions the hypoglycematic properties.—ROGER NETTER and SIMONE ROCHE. *Compt. rend.*, 205 (1937), 934. (G. W. H.)

Insulinic Hypoglycemia and Adrenalinic Hyperglycemia—Opposite Effect of Small and Large Doses of Aluminum Salts on. Using 2–3 Kg. rabbits, doses of 0.16 mg. to 3.5 mg. of aluminum chloride were injected with insulin. With small doses of aluminum chloride the hypoglycemic effect of the insulin was prolonged and strengthened while with larger doses a diminishment of the effect occurred. Similar results were found concerning the hyperglycemic action of adrenalin.—HENRY SCHWAB. *Compt. rend.*, 206 (1938), 211. (G. W. H.)

Liver Extracts—Biological Assay of. The authors report a study of Jacobson's method of standardizing liver extracts by observing the reticulocyte count in guinea pigs after injecting the extracts. In addition to the theoretical objections that the guinea-pigs used are not normal and not anemic, and that the rise in their reticulocyte count is not specific for liver extract since it may be produced by many other substances, the authors found experimental evidence that the method is unsatisfactory. In thirteen of one group of twenty-seven guinea pigs the reticulocyte count was at times above 20 per 1000 erythrocytes—the figure fixed by Jacobson for a positive response—and in all cases there were great variations in the reticulocyte count. In another series a change of diet produced a rise in reticulocytes, in some cases to above 20 per 1000 erythrocytes. This was not due to the effects of salts or vitamins. In both series injections of a therapeutically active liver extract failed to produce a reticulocyte change differing from that occurring in untreated guinea pigs. Morphologically the "shift to the left" in the reticulocytes, characteristic of the response to liver extract and of the new production of erythrocytes, was only seen a few times. The authors conclude that under the conditions indicated by Jacobson the method is not reliable.—R. EGE and E. HAGENS. *Acta path. microbiol. scand.* (1937), 14, 4, 597; through *Brit. Med. J.*, 4023 (1938), 370D. (W. H. H.)

Living Material—Transmission of Excitation in. The author pointed out that the electrical theory is established for conduction in frog's nerve. The propagation of the impulse may be blocked by the application of pressure or by freezing, but the electrical current spreads into the inactive region of the nerve and a second shock therein can be effective at only 10% of the intensity necessary within the primary stimulus. Other evidence, primarily pharmacological, shows that the liberation of a specific chemical in relation to the cell injunction may be of great importance. Thus it is now recognized that the sympathetic nerves act by liberating adrenalin (or something similar) while the para-sympathetic nerve endings release acetylcholine.—C. F. A. PANTIN. *Nature*, 3533, 118; through *Chemist and Druggist*, 128 (1938), 6. (A. C. DeD.)

Male Sex Hormone—Pharmacological Ejaculation Test for Bio-Assay of. A dose of 83 mg. per Kg. of pernoston in 0.67% solution is injected in male adult albino mice. This is followed after 12 minutes by a subcutaneous injection of 10 mg. per Kg. of yohimbine sulfate in 0.5% solution. Ejaculation occurs within 5–40 minutes. Castrate animals are reconditioned for this test by daily injections with testosterone or androsterone on five consecutive days.—S. LOEWE. *Proc. soc. exptl. biol. med.*, 37 (1937), 483. (A. E. M.)

Mitrinermine—Effects of, on the Isolated Intestine, Uterus and Seminal Vesicle. Mitrinermine is an alkaloid obtained from a species of Mitragyna. It stimulates, when in weak concentrations, isolated guinea pig and rabbit intestine and inhibits both in strong concentrations. The effect upon the isolated rabbit uterus is that of stimulation. It has a weak motor action on the isolated seminal vesicle and decreases the action of adrenaline and acetylcholine upon the same. Its site of action is unknown, acting on the muscle or autonomic nervous system. Extracted from rubiaceæ-cinchonidæ like yohimbine and quinine it is, however, neither a true nor minor inhibitor of the sympathetics.—RAYMOND-HAMET. *Arch. intern. Pharmacodynamie*, 56 (1937), 303. (W. H. H.)

Morphine—Effect of, on the Motility of the Human Ileum. A complete suppression of the peristaltic wave with an increase of the frequency of the mixing wave followed 1/8 grain of morphine, beginning 2 to 4 minutes after administration. Circular and longitudinal muscle tone was increased in half of the trials. One-fourth grain of morphine decreased the frequency and amplitude of mixing wave and increased the tone of both muscle coats in all experiments. The depression of movements was still more conspicuous at higher dosage, but the increase of muscle tone did not progress.—ARMAND C. FOSTER. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 332. (A. E. M.)

Morphine—Some Aspects of the Use of. The site, of the action of morphine on the stomach and intestine has been attributed to peripheral plexus or muscular stimulation, since denervation increases the response and atropine does not prevent it. Work in progress indicates that morphine may involve the cholinergic-humoral mechanism.—DONALD SLAUGHTER. *Baylor Staff Activities*, 5 (1938); through *Squibb Abstr. Bull.*, 11 (1938), A-414. (F. J. S.)

Nitroglycerin—Pharmacological Action of. Lethal doses of nitroglycerin for the frog, rabbit and cat are, respectively, 46.5 mg. per 100 Gm., 0.5 Gm. per kilo and 0.15 Gm. per kilo. The mechanism of the intoxication consists in an excitation of the central nervous system: convulsions, paralysis, tetanus with death during these crises. Nitroglycerin is a strongly methemoglobinizing poison, and the formation of methemoglobin is maximum a few hours after administration of the poison. Death can therefore occur by action either on the nervous system or on the blood. The methemoglobinizing action of nitroglycerin confirms that this substance acts on the blood through its nitro groups and is similar to that of nitrites. For the frog, nitroglycerin is 1.8 times as toxic as sodium nitrite (at equivalent N_2O_3 content). If the transformation of hemoglobin into methemoglobin reaches a sufficiently high value, the animal dies in about 7 to 8 hours. *Per os*, nitroglycerin produces neither excitation nor convulsions, irrespective of the dose administered, and death occurs after a few hours; it is then observed that the blood has a very high methemoglobin content.—G. ORESTANO. *Arch. Ital. Sci. Farmacol.*, 6 (1937), 153–172; through *Chimie & Industrie*, 39 (1938), 121. (A. P.-C.)

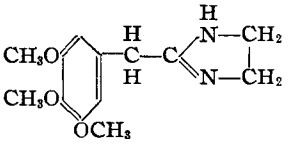
Parathyroid Assay—Dose Response Relationship in the U. S. P. XI. The U. S. P. XI method of assay determines the rise in serum calcium produced by a suitable dose. In regulatory work on bioassay drug products, the question arose as to what constitutes a suitable dose. Results of the investigation are reported. Development of the method is discussed briefly: experimental work is reported in detail; and results are shown in several tables which are discussed. The author believes the U. S. P. XI method is satisfactory for purposes of standardization and is wholly suitable for indicating an absence of parathyroid activity but he enumerates some precautions which must be observed: (1) The dose selected must be shown to produce significant but submaximal increases in the serum calcium of the dogs used. (2) For satisfactory accuracy, more than the minimum of five dogs must be used unless precautions are taken to standardize the reactions of the animals. Such standardization might well be accomplished by adopting as a reference standard a stable powder prepared by methods already published and distributed by the Board of Trustees of the U. S. Pharmacopœial Convention.—LLOYD C. MILLER. *J. Am. Pharm. Assoc.*, 27 (1938), 90. (Z. M. C.)

Phenol—Fate and Action in the Animal Organism. Phenol when administered *in vitro* can be estimated spectrographically in tissues and the urine. Minute quantities can be detected by the reaction with dibromoquinachlorimide. Phenol is not destroyed *in vitro* in the organs. In the absence of the liver, the combination of phenol is a property of the tissues and is not to be accepted as a test of hepatic function. Following the injection of phenol it is generally distributed and found mostly in the skeletal muscles. Combination with sulfur greatly diminishes the toxicity. Absorption from the gastro-intestinal tract is rapid. Hemoglobin, in an animal poisoned with phenol, is capable of combining with oxygen. Convulsions induced by phenol are not checked by calcium salts. The action is directly upon the heart.—G. BARAC. *Arch. intern. Pharmacodynamie*, 56 (1937), 427. (W. H. H.)

Pilocarpine and Calcium Chloride—Action of, on the Blood Sugar in Normal Men. The tests were carried out in the morning on individuals who had been fasting for at least 21 hours. Pilocarpine (1% solution of the nitrate) and calcium chloride (10% solution) were administered intravenously. Blood sugar was determined with Weiss's modification of Bang's method. During the whole time of the test, the individual remained lying on his back. Doses of pilocarpine up to 0.5 mg. produced a slight hypoglycemia (6 to 29% of the initial value); with higher doses the hypoglycemia is preceded by a slight hyperglycemia. Under the same conditions calcium chloride produces hyperglycemia at a dose of 5 Cg., and hypoglycemia at doses of 50 Cg.—D. DANIELOPOLY, S. STOICESCU and E. CIMINO-BÉRANGER. *Bull. acad. méd. Roumanie*, 2 (1936), 898–905; through *Chimie & Industrie*, 38 (1937), 1143. (A. P.-C.)

Preparation 2020, a New Blood Pressure Raising Drug. Preparation 2020, a new sympathomimetic drug, raises the blood pressure and slows the pulse. In therapeutic doses it has little action on the smooth muscle of the alimentary or urogenital tracts. Its action on the bron-

chial musculature renders it of some value in asthma, but it appears to be inferior to ephedrine. It may be useful as an alternative drug when ephedrine is contraindicated or inactive. It has been found helpful in controlling the blood pressure during spinal anesthesia and in the treatment of operative shock. The formula for the above compound is as follows.



F. A. JONES and C. WILSON. *Lancet*, 234 (1938), 195. (W. H. H.)

Procaine-Epinephrine Hydrochloride Solutions—Hemodynamic Effects of Subcutaneous, Submucosal and Subgingival Injections of. Subgingival injections of even dilute concentrations of epinephrine solutions ($^1/_{30,000}$) may cause marked rises in the blood pressure. If epinephrine, a vasoconstrictor, reaches the general circulation in appreciable quantities, so does procaine, which is a vasodilator. In density, age of the patient, myocardial insufficiency, hypertension and arteriosclerosis should be considered before the mixture is applied.—PAUL PICKERING, H. P. STEINMEYER and ARNO B. LUCKHARDT. *Proc. Soc. Exptl. Biol. Med.*, 37 (1938), 729. (A. E. M.)

Pulmonary Artery Reactions—Microscopic Observations of. Fresh sections of excised lung may be used for the microscopic study of rabbit pulmonary artery (but not arteriolar) reactions to drugs and anaphylaxis. Constriction is produced by histamine, mecholyl, barium chloride and Janus green. Atropine antagonizes histamine and mecholyl constriction. Magnesium chloride antagonizes histamine and barium chloride constriction. Epinephrine and benzedrine have little or no effect on the normal rabbit pulmonary artery (intrapulmonary portion). Pilocarpine dilates the normal artery and seems to paralyze the parasympathetic endings. Atropine prevented anaphylactic contraction, while epinephrine was ineffective. A few preparations exhibited rhythmic pendular contractions.—ALBERT J. GILBERT. *J. Pharmacol.*, 62 (1938), 228. (H. B. H.)

Senna—Purgative Action of. Senna infusion, free emodin, the unstable and stable glucoside were examined in chloralosed cats. The active substances when orally administered were absorbed into the blood from the small intestine. They were effective also when injected intramuscularly or intravenously. The latent periods varied between 8 hours and 30 minutes. It is suggested that a fermentative splitting of anthranol occurs in the latent period with oxidation to anthraquinone, which is the supposed effective substance. Anthraquinone in the genuine glucoside form was soluble and fully absorbed. The stable glucoside increased peristalsis without any influence upon the pendulum movements. The unstable glucoside and emodin caused increase of peristalsis and decrease or complete inhibition of pendulum movements, increase of tonus, and in excessive doses convulsions and vomiting. The stable glucoside only was considered an effective laxative.—W. STRAUB and E. TRIENDL. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 1; through *Physiol. Abstr.*, 22 (1937), 1099. (F. J. S.)

Sex Hormones and Action of Adrenaline. Folliculin increases the vascular reaction to adrenaline of the female frog. Testosterone increases that of males. Folliculin diminishes the sensibility in the male and testosterone diminishes that of the female.—F. KARASEK and O. POUPA. *Compt. rend. soc. biol. Paris*, 126 (1937), 118; through *Physiol. Abstr.*, 22 (1937), 1085. (F. J. S.)

Sodium Iodoacetate. Sodium iodoacetate is a potent salt capable of influencing the activity of a heart when used in dilutions as low as one part in ten thousand millions. When used in strengths from one part in one hundred to one part in ten thousand millions, two actions were regularly observed, a capacity for maintaining or augmenting cardiac activity and a capacity for producing partial heart block. Very strong solutions of the salt, one part in one million or less, also depress cardiac activity and cause arrest in diastole. Sodium iodoacetate also effects some change in the cardiac muscle which eventually leads to arrest in systole.—P. C. GUPTA. *Arch. Intern. Pharmacodynamie*, 58 (1938), 158. (W. H. H.)

***k*-Strophanthidin—Action of Natural and Synthetic Derivatives of.** The action of *k*-strophanthidin, its natural derivatives (*k*-strophanthin and cymarin), and 27 synthetic derivatives (esters with non-substituted or substituted fatty acids, aromatic and fatty aromatic acids) were studied in frogs and mammals. On frogs and isolated frogs' hearts some of the esters, especially those of iso-fatty acids, have the same range of efficiency as the natural glucosides. The optimum effect was produced with acids with 4–6 carbon atoms. The effect of aromatic esters was increased by addition of nitro groups. Marked effects were also caused by some of the oxyacid esters substituted by alkyl residues or acylation. In the esters of substituted fatty acids the optic activity of the genin part seemed to be of similar importance as in natural glucosides. In rabbits all esters similar to the glucosides were more active than the genin. In cats this was the case only with acetyl-*k*-strophanthidin. The general importance of esterification for increase of activity is discussed.—W. NEUMANN. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 329; through *Physiol. Abstr.*, 22 (1937), 1102. (F. J. S.)

Strychnine and Brucine—Studies on. IX. Monobromoisostrychnine, crystallizing from chloroform with one mole of $CHCL_3$, was obtained on treating a solution of isostrychnine in aqueous hydrobromic acid with an aqueous bromine solution. The pharmacological examination of the bromo derivative showed its lethal dose to be 0.033 and 0.053 Gm. per Kg., respectively, for the frog and rabbit. It exerted a paralyzing action on the former and produced convulsions in the latter. Its toxicity was less than that of isostrychnine.—RICCARDO CIUSA and V. AMORUSO. *Gazz. chim. ital.*, 67 (1937), 723; through *Squibb Abstr. Bull.*, 11 (1938), A-263. (F. J. S.)

Sulfanilamide—Passage of, from Mother to Fetus. Sulfanilamide, when given by mouth in pregnant rabbits, passes from the maternal to the fetal circulation. It can be also detected in the amniotic fluid.—HENRY M. LEE, ROBERT C. ANDERSON and K. K. CHEN. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 366. (A. E. M.)

Sulfomercurial Compound (Hermophenyl)—Action of, on Blood Coagulation. Hermophenyl did not induce precipitation, in the cold, of the plasma and serum proteins. The coagulation of the recalcified plasma oxalate is always prevented *in vitro* in a concentration of 2 parts per 1000 of hermophenyl and sometimes at 1.33 parts per 1000. The coagulation of the recalcified plasma oxalate is retarded *in vitro* in part in a content of 0.005 to 0.2 part per 1000 of hermophenyl. The coagulation of the recalcified plasma oxalate is sometimes accelerated *in vitro* in the concentrations of 0.033 to 0.04 per 1000 of hermophenyl. The coagulation of the plasma oxalate of the normal rabbit by staphylocoagulase is retarded by 0.333 per 1000 of hermophenyl. Rabbits always die in less than five minutes after the intravenous injection of 45 mg. of hermophenyl per Kg. of body weight and such is sometimes the case when 30 mg. of this substance is introduced into the circulation. A dose of 25 mg. will cause death in between eight and thirty minutes. The dose of 20 mg. is always well tolerated. With a dose of 15 mg. per Kg. hermophenyl is able to retard the coagulation of a little of the recalcified plasma oxalate arising from the withdrawn carotid blood ten to thirty minutes after this injection. Hermophenyl does not modify the first phase of the coagulation *in vivo*. It retards but does not prevent the transformation of the proserozyme into serozyme *in vitro*. The retarding action of hermophenyl is, when *in vivo* as *in vitro*, more pronounced on the second phase of coagulation (formation of thrombin) than on the third phase (action of thrombin on fibrinogen). The content of the plasma in fibrinogen diminishes ten minutes after the intravenous injection of 40 mg. of hermophenyl (per Kg.); it again increases but does not return to the initial value thirty minutes after the injection. The number of erythrocytes and also the platelets increase in the carotid blood after non-fatal intravenous doses of hermophenyl. The augmentation of the platelets is very pronounced ten minutes after the injection and later attenuated. Slightly before death and sometimes thirty minutes after the injection of a non-lethal dose of hermophenyl one notes a diminution of the number of platelets with more or less marked augmentation of the erythrocytes.—E. ZUNZ and E. CRACIUNESCU. *Arch. Intern. Pharmacodynamie*, 58 (1938), 175. (W. H. H.)

Sympatholytics and Sympathomimetics. The intravenous injection of 7.5 to 10 mg. per Kg. of diethylaminomethyl-3-benzodioxane or F. 883 and of piperidomethyl-3-benzodioxane or F. 933 inverted the hypertensive effect of adrenaline, epinine, corbasil, levorotatory *p*-sympathol and racemic *p*-sympathol. These synthesized sympatholytics invert in the majority of cases and notably diminishes or abolishes the hypertension produced by dextrorotatory *m*-sympathol. They greatly reduced and sometimes prevented the hypertension produced by levorotatory *m*-

sympathol. They diminish besides in a strong variable measure the effects of tyramine, hordenine, ephedrine and phenylethanolamine. Occasionally, they diminish very much the hypertension produced by noradrenaline, but at other times they do not appreciably modify the effect. The hypertensive effect of norephedrine is not ordinarily subject to changes under the influence of these synthesized sympatholytics. The apnee provoked by adrenalone, epinine, corbasil and the sympathols is prevented when the hypertension is transformed to hypotension by diethylaminomethyl-3-benzodioxane or F. 833 and by piperidomethyl-3-benzodioxane or F. 933. When the hypertensive effect is simply attenuated, the apnee is ordinarily not survived, but upon the reinjection of the sympathomimetics the duration is greatly reduced. Such again is the case, however, upon the reinjection of noradrenaline, tyramine, hordenine and phenylethanolamine. The action of norephedrine upon the respiration is neither modified by diethylamino-3-benzodioxane or F. 883 or by piperidomethyl-3-benzodioxane or F. 933. The intravenous injection of 10 mg. per Kg. of phenoxy-1-diethylamino-2-ethane (J. L. 415 or F. 928) inverses the hypertensive effects of epinine, corbasil and levorotatory *p*-sympathol and prevents the apnee provoked by these amines. Phenoxy-1-diethylamino-2-ethane does not inverse the hypertension produced by noradrenaline. The intravenous injection of 7.5 to 10 mg. per Kg. of paramethoxydiethylaminoethylphenol or F. 940 sometimes diminishes the hypertensive effect of adrenalone, epinine and corbasil. F. 940 does not appreciably modify the hypertensive effects of noradrenaline, the sympathols, tyramine, hordenine, ephedrine, norephedrine and phenylethanolamine. Diethylaminomethyl-3-benzodioxane or F. 883 and piperidomethyl-3-benzodioxane or F. 933 behaves in a general manner like ergotamine and the other large molecular alkaloids of ergot with respect to the hypertension and apnee of the sympathomimetic amines (except for the sympathols) whereas this is not the case for paramethoxydiethylaminoethylphenol or F. 940.—E. ZUNZ and R. BONNYNS. *Arch. intern. Pharmacodynamie*, 58 (1938), 108. (W. H. H.)

Testosterone and the Female Genital Tract. The authors have examined the action of testosterone propionate on female rabbits. Cotte and Noël have previously shown that testosterone acetate, in rabbits, (1) inhibits the sexual cycle of the non-castrates animal, preventing follicular ripening and luteinization, and (2) lacks the capacity of folliculin to induce rut in the castrated animal. The propionate has a five times greater biological activity, but in the castrated rabbit produces no secretory phenomena in the endometrium. On the other hand it has a well-marked effect on stroma cells, producing sclerotic changes in the ovary and uterine cornua, and sclerosis and cyst formation in the mammary gland. In the ovary, ovulation is profoundly disturbed and many atretic follicles are seen; these changes are probably brought about through the hypophysis. Arrest of uterine hemorrhage has been reported by Mocquot and Palmer after therapeutic administration of testicular hormone.—G. COTTE, J. F. MARTIN and E. MANKIEWICZ. *Gynecologie* (Oct. 1937), 561; through *Brit. Med. J.*, 4018 (1938), 104D. (W. H. H.)

Theophylline—Influence of, upon the Absorption of Mercupurin and Salyrgan from the Site of Intramuscular Injection. The rate of absorption following the intramuscular injection of a mercurial diuretic (Mercupurin or Salyrgan) has been studied and found to be greatest immediately following the injection. The presence of theophylline influences the absorption of mercurial diuretics to a marked extent. Those preparations containing theophylline are superior to the others as regards rapidity and completeness of absorption.—ARTHUR C. DEGRAFF, ROBERT C. BATTERMAN and ROBERT A. LEHMAN. *J. Pharmacol.*, 62 (1938), 26. (H. B. H.)

Thyroxine and Cocaine—Mutual Action of, in the Animal Body. Thyroxine increases the rise in body temperature brought about by cocaine, but antagonizes its action on the central nervous system.—D. E. HYKESOVA and J. RERABEK. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 599; through *Physiol. Abstr.*, 22 (1937), 1103. (F. J. S.)

Tylophora Asthmatica—Chemical and Pharmacological Investigation of. From the dry plant the yield of total alkaloids was 0.44%, of which 0.1% was amorphous tylophorine, $C_{24}H_{27}NO_4$, which melts at 125° to 130° C. with decomposition. It yields a hydrochloride melting at 261° to 265° C. with decomposition, a hydrobromide melting at 252° to 255° C. with decomposition, a hydriodide melting with decomposition at 243° to 245° C., a yellow platinate melting at 251° C., an aurate then decomposes on heating. This alkaloid is very weakly basic, as is an accompanying alkaloid still under examination. After removing the alkaloids, a substance having emetic and purgative properties was isolated, which seems to be neither an alkaloid nor a glucoside. Tylophorine exerts a stimulating effect on the general muscular system of the body, but

paralyzes the heart muscle. The blood pressure is first depressed and then rises. The initial depressant action is due to the paralyzing action exerted on the heart muscle, and the subsequent rise in pressure is due to its exciting action on the smooth muscles of the blood vessels; there results an increase in cardiac activity.—R. N. CHOPRA, N. N. GHOSH, J. B. BOSE and S. GHOSH. *Arch. Pharm.*, 275 (1937), 236–242; through *Chimie & Industrie*, 38 (1937), 738. (A. P.-C.)

Vitamin B_1—Influence of, on the Activity of Acetylcholine. Using as a biological test the eserinized dorsal muscle of the leech as developed by Minz (*Arch. intern. Physiol.*, 42 (1936), 281) it was shown that after being subjected to the action of a solution of vitamin B_1 the sensitivity of the muscle changes. A solution of acetylcholine produces a more pronounced effect of longer duration.—BRUNO MINZ and RENE AGID. *Compt. rend.*, 205 (1937), 577. (G. W. H.)

Vitamin C in Heart Failure. Vitamin C increased the urinary output in each of eight patients with heart failure and in another with considerable oedema of the lower extremities of unknown ætiology. In two patients the increase was slight, in four it was either moderate or considerable, and in three cases it was great. When compared with the recognized diuretics vitamin C was found to be as efficient as ammonium chloride in producing diuresis during one observation period but less efficient during two other periods. It was more efficient than theobromine during one trial period and less during another. In one patient it was less efficient than diuretin. It proved to be as efficient as digitalis in increasing the urinary output during one period of observation and more efficient during six others. When a quantitative estimate was made of the excess of urinary output over fluid intake in the nine patients over a period of 173 days, it was found that vitamin C induced greater diuresis than digitalis but less than theobromine, diuretin and ammonium chloride. In each of three patients where heart failure had occurred with auricular fibrillation, vitamin C induced diuresis actually in excess of that produced by digitalis although never with the same degree of clinical improvement nor with reduction of the ventricular rate. These results, apportioning to vitamin C a diuretic property, direct attention to the need of providing an adequate supply of vitamin C for all patients with heart failure. In order to ensure a constant state of vitamin C saturation in heart failure, it is probably enough to include in the patient's diminished fluid intake an adequate proportion of lemon and orange juice.—W. EVANS. *Lancet*, 234 (1938), 308. (W. H. H.)

Yohimbine—Experimental Study of. Tests on the isolated heart did not permit of observing a definite inversion of the adrenalinic action, after treatment with yohimbine; on the other hand, there was often noted a disappearance of cardiac arythmia by auricular fibrillation, under the action of yohimbine. The cerebral vessels swell under the action of yohimbine while the spleen undergoes a constriction which is more probably due to a lowering of the blood pressure than to specific excitation of the contractile elements of that organ. As regards intestinal mobility, there is observed an increase in the amplitude of the pendular movements of the intestine and a tonic action on the contractile elements. Yohimbine completely inhibits the action of adrenaline on the circulatory system and on intestinal motility. The adrenalinic constriction of the spleen after the action of yohimbine leads to the belief that this substance paralyzes only the sympathetic vascular endings of the organ without modifying the contractile extra-vasal elements.—A. BOSCHETTI znd C. COZZUTTI. *Boll. soc. ital. biol. sper.*, 11 (1936), 834–835; through *Chimie & Industrie*, 38 (1937), 935. (A. P.-C.)

TOXICOLOGY

Aminobenzenesulfonamides—Isomeric, Relative Oral Toxicities for Mice of. The following summary is given: The relative oral toxicities for mice of pure *o*-, *m*- and *p*-aminobenzenesulfonamides have been determined. The approximate 50% mortality doses of these substances for mice of 20 Gm. body-weight are, respectively, 60 to 80 mg., 90 to 100 mg. and 80 mg., from which it is inferred that the presence of traces of *o*- and *m*-aminobenzenesulfonamides in commercial specimens of *p*-aminobenzenesulfonamide should not appreciably affect the toxicity of the latter.—W. J. C. DYKE. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 319–322. (S. W. G.)

Bismuth Subnitrate Poisoning in an Infant. A case of severe cyanosis with recovery occurred in an infant after the administration of a half teaspoonful of bismuth subnitrate powder in a half teaspoonful of elixir of lactated pepsin four times a day for three days for the treatment of diarrhea. The cyanosis is attributed to nitrates, which, according to the literature, may be formed from bismuth subnitrate by putrefactive bacteria in the intestine. T. stresses the fact that bis-

muth subnitrate, which is in common use in the treatment of infantile diarrhea, may occasionally be a dangerous drug and has no advantages over the other preparations of bismuth. He suggests that bismuth subcarbonate be used instead.—JOHN C. TAYLOE. *South Med. and Surg.*, 100 (1938), 62; through *Squibb Abstr. Bull.*, 11 (1938), A-519. (F. J. S.)

Cannabis Indica Resin—Observations on the Active Principles of. *Cannabis indica* resin is known to contain an oily substance cannabinol, $C_{21}H_{26}O_2$. It has been found that after *p*-nitrobenzoylation of the resin, cannabinol may be removed almost completely as a crystalline ester about 25% of the whole. The uncrystallizable fraction could not be fractionated by crystallization of derivatives or by distillation. Analyses of this mixture indicated an average formula of $C_{21}H_{30}O_2$. Preliminary experiments using chromatographic analysis show that this resin can be freed from the last traces of cannabinol and separated into several fractions which are under chemical investigation. Preliminary experiments on the physiological activity of the constituents of the *Cannabis indica* resin have been carried out on rabbits. Pure cannabinol is found to be lethal in a dose of 2 mg. per Kg. rabbit (intravenous). The residual cannabinol-free oil is much less toxic and when separated into several fractions as described, some of these are found to possess marked "hashish"-like properties.—F. BERGEL, A. R. TODD and T. S. WORK. *Chemistry and Industry*, 57 (1938), 86. (E. G. V.)

Copper Fungicides. III. Distribution of Fungicidal Properties Among Certain Compounds. The fungicidal activity of many copper compounds is examined. Cuprous oxide and cupric oxide adhere less satisfactorily to potato foliage than do Bordeaux mixture, but are more toxic on the basis of equal copper content. Copper cyanide was slightly inferior to an oil-Bordeaux-arsenate preparation for control of pear scab, and was somewhat phytocidal.—R. W. MARSH, H. MARTIN and R. G. MUNSON. *Ann. Applied Biol.*, 24 (1937), 853–866; through *J. Soc. Chem. Ind.*, 57 (1938), 207. **IV. Fungicidal Value of the Copper Oxides.** The fungicidal value of cupric oxide and cuprous oxide varied with the method of manufacture and the size of the particles. Cuprous oxide showed the greater ability to inhibit spore germination. Inhibition of germination results from the formation of soluble copper compounds, that produced from cuprous oxide being more active than that from cupric oxide.—J. G. HORSFALL, R. W. MARSH and H. MARTIN. *Ibid*, 867–882; through *J. Soc. Chem. Ind.*, 57 (1938), 207. (E. G. V.)

Diethylene Glycol Poisoning in the Human. Case reports are made of four deaths resulting from the use of elixir of sulfanilamide. The histological findings in these cases are given, revealing a picture similar to that produced by other poisonings and yet apparently characteristic of the effect of diethylene glycol.—KENNETH M. LYNCH. *Southern M. J.*, 31 (1938), 134; through *Squibb Abstr. Bull.*, 11 (1938), A-405. (F. J. S.)

Diethylene Glycol—Renal Lesions Due to. Fatalities from elixir sulfanilamide made with diethylene glycol prompted work on pharmacology and pathology of glycols. Diethylene glycol administered to 107 young adult white rats in drinking water, and to 26 rabbits pure substance intravenously. All kept on standard laboratory diet. Doses graded in amount. Deaths occurred in from 5 to 56 days. Examination of viscera disclosed chief lesions in kidneys, including congestion and necrosis. One to two cc. per Kg. body weight intravenously, necessary to kill. Three to 5% diethylene glycol in drinking water killed 50% in 1 to 8 weeks.—H. D. KESTEN, *et al. J. Am. Med. Assoc.*, 109 (1937), 1509. (G. S. G.)

East African Plants—Insecticidal Properties of Some. III. Mundelea Suberosa. Benth. Chemical Constituents. Variability of Samples. The bark of *M. suberosa* yielded rotenone (I), white crystals, probably mixed *l*-deguelin and tephrosin, and yellow crystals, probably dehydrorotenone, glucosides and alkaloids. The crystals are probably derived from a more toxic precursor. Only I is appreciably toxic to aphides. Two varieties of *M. suberosa* are described. Dry growth conditions and calcareous soils favor the production of I and other toxic substances by the plants. A fair correlation exists between toxicity and I or "optical" dehydrocompound contents, but not between toxicity and ether extractives or "Takei" dehydrocompounds.—R. R. LE G. WORSLEY. *Ann. Applied Biol.*, 24 (1937), 651–658, 659–664; through *J. Soc. Chem. Ind.*, 57 (1938), 208. (E. G. V.)

Glycerine, Ethylene Glycol, Propylene Glycol and Diethylene Glycol. Report of feeding experiments with rats. Use of glycols as hygroscopic agents in place of glycerin in industry, cigarettes, etc., prompted study of effects when ingested. Glycerine apparently harmless addition to diet, but included in list. Experimental feeding for 11 weeks of $4^1/_2$ months old female rats

with 20% glycerin in their solid food showed same gain as control animals. Similar concentrations of commercial diethylene glycol killed all rats within 2 weeks. Ten and 5% concentrations fatal in some cases in food, much more toxic in drinking water. With equimolar concentration of ethylene glycol in drinking water, rats lived only 4 days. With equimolar concentration of propylene gycol in water, one died at 10th week, others sick and losing weight. Pathologic examination of lung, liver, kidney and myocardium proved negative for diethylene glycol. Pregnancy did not occur with higher concentrations, and occurred less frequently and with smaller litters, in lower concentrations. Ethylene glycol proved most toxic, diethylene glycols slightly less so, and propylene glycol least toxic.—HAROLD G. O. HOLCK. *J. Am. Med. Assoc.*, 109 (1937), 1517. (G. S. G.)

Gold Compounds—New Method of Determining the Toxicity of. The intramuscular injection of aurothioglucose in saline solution daily for fourteen days caused in dogs, an increase of the eosinophile count. The same compound in oil, when administered in the same manner caused a similar increase. By intravenous route a similar action was obtained. The author recommends this procedure as a test for the toxicity of gold compounds.—A. M. ERNST. *Arch. intern. Pharmacodynamie*, 56 (1937), 193. (W. H. H.)

Hydrogen Sulfide Poisoning—Acute, Protective Action of Some Substances in. Sodium nitrite, silver chloride, methylene blue and methylene blue plus glucose were tried as antidotes for hydrogen sulfide poisoning. Twelve rats were given, by subcutaneous administration, water saturated with hydrogen sulfide and death was produced in all. The doses varied with the weight of the rat. Twelve other rats, previously given sodium nitrite, were injected in the same manner with the same solution of hydrogen sulfide. The results showed only two deaths. The other mentioned substances were protective but to a less extent. Methylene blue was the most effective of the remaining compounds. Silver chloride although toxic itself, seemed to increase the toxicity of hydrogen sulfide. Glucose alone when administered on the day prior to the trial and also on the same day aided in protecting the animal. Similar results were also obtained with rabbits.—G. A. MALOFF, M. G. NIKOLAJEW and E. I. RUDENKO. *Arch. intern. Pharmacodynamie*, 56 (1937), 232. (W. H. H.)

Insecticide—Derris Versus Cubé as. For the control of certain insects, derris gives slightly better results than cubé of the same rotenone (I) content. The author suggests that the superiority may be apparent only, and attributable to differences in particle size or to underestimate the I content of derris.—R. C. ROARK. *Soap*, No. 1, 14 (1938), 111–113, 120; through *J. Soc. Chem. Ind.*, 57 (1938), 310. (E. G. V.)

Lead, Mercury, Chromium, Phosphorus, Strontium and Fluorine—Phosphorous Content of Blood and Bones in Intoxications with. In lead and chromium intoxications the total phosphorus (inorganic and lipoid phosphorus) increases, but the acid-soluble phosphorus decreases. In mercury intoxication the content of all forms of phosphorus decreases in the blood. In acute strontium poisoning the total and lipoid phosphorus increase and the inorganic and acid-soluble phosphorus decrease; in chronic strontium poisoning the reverse is true. In fluorine poisoning the behavior of the phosphorous content is rather irregular; in phosphorous intoxications the blood phosphorus does not vary appreciably. As regards the phosphorous content of bones, there is a slight decrease, especially in the epiphysian zones, in chromium and lead intoxication, no appreciable change in phosphorous and mercury intoxications, and a considerable increase in fluorine and strontium poisonings. The phosphorous contents of blood and bones sometimes vary in the same direction (intoxication by fluorine and strontium), sometimes in opposite directions (lead and chromium) and sometimes there is no relationship between the two (phosphorus and mercury). —P. CIRLA. *Medicina Lavoro*, 28 (1937), 44–54; through *Chimie & Industrie*, 39 (1938), 74. (A. P.-C.)

Lipoid Pneumonia and Oil in Lungs. Fatal cases of pneumonia due to aspiration of oily preparations into lungs noted especially in children under 2 years, from instillation of oily nose drops. Lipoid pneumonia in adults, due usually to liquid petrolatum, develops slowly over a period of years and is accompanied by bronchopulmonary symptoms. At necropsy lungs show evidence of reaction to foreign body and secondary invasion by bacteria. Especially dangerous to debilitated elderly people. Advise care in use of oily materials in respiratory tract.—CURRENT COMMENT. *J. Am. Med. Assoc.*, 109 (1937), 1367. (G. S. G.)

Nicotine—Wider Insecticidal Uses for. A solution of nicotine in refined petroleum oil does not deteriorate on storage and is effective against a variety of insects, especially those with high rates of metabolism, when applied directly as a "fog."—P. O. RITCHER and R. K. CALFEE. *J. Econ. Entomol.*, 29 (1936), 1027–1028; through *J. Soc. Chem. Ind.*, 57 (1938), 207. (E. G. V.)

Nicotine Acid—Toxicity of. Nicotinic acid is at least several hundred times less toxic in mice, rats and guinea pigs than nicotine. Nicotinic acid is devoid of action upon the autonomic ganglia. Nevertheless, repeated administration of large doses, 2 Gm. daily, in dogs has resulted in poisoning and death.—K. K. CHEN, CHARLES L. ROSE and E. BROWN ROBBINS. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 241. (A. E. M.)

Pentothal Sodium—Circulatory Effects of. The first undesirable effect of a single sublethal dose of pentothal sodium is sudden cessation of respiration. Repeated administration of small amounts, sufficient to maintain light anesthesia, suddenly produces signs of heart muscle poisoning. There seems to be a cumulative action. The longer the administration is continued, the more does the threat seem to shift to the more fatal circulatory side.—CHAPMAN REYNOLDS and J. ROSS VEAL. *Proc. Soc. Exptl. Biol. Med.*, 37 (1938), 627. (A. E. M.)

Periplocymarin, Bufotalin and Desacetyl-Oleandrin—Potency of. Reference is made to the discovery of these compounds and the establishment of their structure. Exact potency had not been reported and the present report tabulates and discusses data. Cats and frogs were used as test animals. Periplocymarin has approximately the same cat unit as scillaren A and coumingine hydrochloride, is less potent than convallatoxin, B- and A- antiarins, ouabain, calotropin and cymarin. Bufotalin is less powerful than areno-, querico-, gama- and virido-bufagins but more powerful than other bufagins so far investigated, having a potency 2.3 times that of vulgaro-bufotoxin, a cardiac principle found in the secretion of the same species of toads. Desacetyloleandrin is less active than oleandrin. It seems to be more prompt but less persistent.—K. K. CHEN, ROBERT C. ANDERSON and E. BROWN ROBBINS. *J. Am. Pharm. Assoc.*, 27 (1938), 113. (Z. M. C.)

Sea Anemones—Poison of. These poisons come from the nematocysts. The sea anemone (*Anemonia sulcata*) was extracted with 95% ethanol for 2 hours at 60° to 70° C. and then twice with 60% ethanol; 13.3 Kg. of fresh animals gave 613 Gm. of dry extract. This was subjected to a long process of purification, involving precipitation from water with 96% ethanol, extraction of the precipitate with 85% ethanol, precipitation with ether, precipitation of the water solution with lead acetate and phosphotungstic acid, extraction of the last precipitate by 70% acetone, decomposition of the two fractions by barium hydroxide, finally giving 363 mg. of a product of activity 1γ and 638 mg. of a product of activity 3γ. The former gives color reactions indicating the presence of the more important protein-degradation products; it has a molecular weight between 1000 and 2000; it is unchanged in a sterile, weak acid solution (4 months) and in mineral acids for 24 hours, but loses its activity in 1 hour at 100° C.; in alkali the activity disappears in 24 hours. It is probably of the albumin (histone) type.—R. S. ONDERHOFF. *Liebigs Ann. Chem.*, 525 (1936), 138–150; through *Chimie & Industrie*, 38 (1937), 930. (A. P.-C.)

Sulfanilamide and Diethylene Glycol—Toxicity of. The toxicity of diethylene glycol was found about 12,500 mg. per Kg. when given intraperitoneally. The hydrochloride of sulfanilamide is about 4 times as toxic as the base.—CHARLES F. POE and PAUL C. WITT. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 559. (A. E. M.)

Toxic Agents—Increased Resistance to. Mice differ in their resistance to daily increased injections of medinal (diethyl malonylcarbamidnatrium). These differences in resistance are apparent and in the same direction whether the injections given are based upon the body weight or are fixed amounts for all animals. The resistance demonstrated to medinal appears to be the greatest during the period of most rapid growth. Mating of the mice increased their resistance. This increase was especially marked in females. The increase in the resistance due to mating is statistically proved for females and is almost certain in males in spite of the fact that a small number of animals was used in the experiments.—E. AGDUHR and D. H. BARRON. *Arch. Intern. Pharmacodynamie*, 58 (1938), 351. (W. H. H.)

Toxicology—Methods and Aims of Modern. The author gives a comprehensive review with bibliography.—R. FABRE. *J. pharm. Belg.*, 20 (1938), 1–4, 27–34, 49–52, 67–72, 85–91, 109–112, 131–135, 149–152. (S. W. G.)

Trichloroethylene—Classification of. The Conseil d'Hygiene on April 25, 1937 declared that the listing of trichloroethylene with hazardous substances was unjustified, since the present 98% pure and completely stabilized product is not dangerous, as was the former product which contained 8–10% impurities and was quickly decomposed. Since 1930 no case of acute poisoning has appeared.—M. TRILLAT. *Ann. hyg. publ. ind. sociale*, 15 (1937), 434; through *Squibb Abstr. Bull.*, 11 (1938), A-386. (F. J. S.)

Trichloroethylene and Tetrachloroethane—Toxicology of. Acute intoxication due to trichloroethylene manifests itself in man by narcosis, loss of equilibrium and of sensitiveness. Post mortem examination shows a generalized congestion of all the organs. Chronic intoxication produces nervous disturbances: paralysis of the trigeminal and optic nerves, polyneuritis. The toxic dose has not yet been definitely established, but it would seem that a limit of 5 mg. per liter should be set as the maximum trichloroethylene concentration of industrial atmospheres. Tetrachloroethane also produces narcosis. Its prolonged action manifests itself by gastric troubles and ictera, frequently severe. It acts also on the nervous system. Industrial atmospheres should not contain more than 1 mg. of tetrachloroethane per liter.—GASQ. *Bull. trav. soc. pharm. Bordeaux*, 75 (1937), 87–101; through *Chimie & Industrie*, 38 (1937), 1101. (A. P.-C.)

Vitamin C—Glycerol Toxicity and Hemoglobinuria in Relation to. The administration of ascorbic acid prior to a parenteral dose of glycerol will raise the dose necessary to produce hemoglobinuria by 100% or more. The ascorbic acid may be effective in lowering the mortality rate from toxic doses of parenteral glycerol.—CARL PFEIFFER and I. ARNOVE. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 467. (A. E. M.)

Weed Killers—Chemical. V. Relative Toxicity of Selected Chemicals to Plants Grown in Culture Solution. Use of Relative Growth Rate as a Criterion of Toxicity. Methods of determining toxicity are examined. Among highly toxic, but not less active, herbicides the order of toxicity is the same whether the substance is sprayed over the plant or applied to the culture solution. The period between application of the herbicide and death of the plant diminishes as the dosage is increased, within a limited range, but varies with the nature of the substance and is unrelated to the order of toxicity. Amounts of herbicide greater than the lethal dosage seriously restrict growth of plants, but this restriction cannot be used as a measure of toxicity. Growth rate-dosage curves (recorded) indicate that mortality occurs when the growth rate falls to approximately 2.4% daily. The intake of sodium chlorate by plants increased with the concentration of the nutrient, but the absolute amount entering the plant represents a small but approximately constant proportion of that present.—W. H. COOK. *Can. J. Research*, 15C (1937), 520–537; through *J. Soc. Chem. Ind.*, 57 (1938), 425. (E. G. V.)

THERAPEUTICS

Acacia Therapy in Nephrotic Oedema. The author discusses the rationale of the treatment of nephrotic oedema by the intravenous injection of acacia solution. The object of this form of therapy is to raise the serum colloid osmotic pressure, and thus to encourage the flow of fluid from the tissues to the capillaries. The author treated four cases by this method, with favorable results as regards diuresis and diminution of oedema. As a result of his study of these cases he concludes that the diuresis is due not so much to an increase of the plasma colloid osmotic pressure as to an increase in the plasma volume. For this reason he uses relatively small doses, usually 500 cc. of 6% acacia in normal saline for adults, repeated at daily intervals for three or four days. The plasma albumin level should be closely watched, and if it falls too sharply, acacia therapy should be discontinued until the albumin level has been substantially improved. A previous adequate trial of a high-protein salt-poor diet and diuretics such as urea or saline diuretics is indicated. Transfusions of whole blood serum, or plasma should also be tried before using acacia. The usefulness of the method is not limited to cases of nephrosis, for the results have been equally good in cases of chronic active glomerulonephritis in the nephrotic stage. The so-called deleterious effects of acacia described by other writers may be explained on grounds other than those of the toxicity of acacia.—M. J. LEPORE. *Ann. Internal Med.* (Aug. 1937), 285; through *Brit. Med. J.*, 4014 (1937), 1206B. (W. H. H.)