PHARMACEUTICAL ABSTRACTS

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CHEMISTRY

ORGANIC

Unclassified (Continued)

Trans-$\Delta^{5,6}$-Dehydro-Desoxy-Androsterone—Preparation of. Trans-$\Delta^{5,6}$-dehydro-desoxy-androsterone was prepared by the reduction of the ketonic function in the 17-position in trans-$\Delta^{5,6}$-dehydro-androsterone using the methods of Clemmensen and Kishner-Wolff. This body has a certain androgenous activity; it is about 250 times weaker than testosterone (tested on the capon). The estrogenic activity determined on mice is practically nil.—YVES RAOUL and PAUL MEUNIER. *Compt. rend.*, 207 (1938), 681. (G. W. H.)

5,5-Dialkylhydantoins Containing a Dialkylamino Substituent. The preparation and identification of ten 5,5-dialkylhydantoins containing dialkylamino substituents are given. No pharmacological data is included.—J. WM. MAGEE and HENRY R. HENZE. *J. Am. Chem. Soc.*, 60 (1938), 2148. (E. B. S.)

Digoxigenin—New Degradation of. The diacetate of digoxigenin was oxidized by permanganate, saponified to a trihydroxy-etiocholanic acid and, by means of sulfuric acid, converted into the dihydroxycholenic acid. This was converted into the methyl ester and reduced to the dihydroxy-cholanic acid which was oxidized with chromic acid. The diketo-ester upon bromination and subsequent treatment with pyridine, yielded a Δ^4-diketoetiocholenic acid methyl ester which melted at 237°. The corresponding compound from corticosterone melts at 178°. Apparently the oxygen distribution in digoxigenin and corticosterone is not the same.—M. STEIGER and T. REICHSTEIN. *Helv. Chim. Acta*, 21 (1938), 828. (G. W. H.)

Emetic—Complex Structure of Ordinary. When an aqueous solution of ordinary tartar emetic is examined by Duval's method, provided that the p_H is between 3.8 and 7.2 (by suitable addition of hydrochloric acid or sodium hydroxide), the antimony and tartaric acid are present as an antimoniotartaric anion, the potassium as cation.—P. DUQUENOIS. *Compt. rend.* 207 (1938), 570–571; through *Chem. Abstr.*, 33 (1939), 493. (E. G. V.)

Emulsions—Studies in Water-in-Oil. Preparation of Magnesium Oleate. Interactions of aqueous solutions of sodium oleate and magnesium chloride produces a white precipitate which, after filtration and drying in a vacuum dessicator over concentrated sulfuric acid, has the formula $Mg(C_{18}H_{33}O_2)_2.2H_2O$. It is only slightly soluble in benzene, while anhydrous sodium oleate is very soluble. Addition of small amounts of water to benzene solutions of anhydrous sodium oleate develops turbidity which microscopic examination shows to be due not to an emulsion, but to a suspension of hydrated magnesium oleate. It is therefore clear that the reason for the inversion of benzene in water emulsions stabilized by univalent soaps cannot be, as suggested by Parsons and Wilson, solution in benzene of the bivalent soap formed by metathesis.—R. C. PINK. *J. Chem. Soc.*, (1938), 1252–1254; through *Chem. Abstr.*, 33 (1939), 450. (E. G. V.)

Ethyl Chloride. Ethyl chloride is prepared by leading vinyl chloride and excess of hydrogen over a hydrogenation catalyst at a high temperature and, optionally, at high pressure. Examples are given in which catalysts of nickel and alumina gel are used.—WALTER BAUMANN and JOSEPH HIRSCHBECK, assignors to I. G. FARBENINDUSTRIE A.-G. U. S. pat. 2,118,662, May 24, 1938. (A. P.-C.)

Hydantoins Derived from the Analogs of 1,3-Dichloroisopropoxyethyl Methyl Ketone. The preparation of eight new hydantoins from a series of dichloroisopropoxyethyl alkyl ketones is given. Bucherer's method for preparing 5,5-disubstituted hydantoins has been extended to include the alkyl halogenoalkoxy-alkyl type. A new derivative of Nirvanol, namely 5-(1-(2-chloro-1-chloromethylethyl)-oxy)-ethyl-5-phenylhydantoin was also prepared. No pharmacological report is given.—BRUCE B. ALLEN with HENRY R. HENZE. *J. Am. Chem. Soc.*, 60 (1938), 1796. (E. B. S.)

Hydroxypyruvic Aldehyde—New Method for the Purification of the Alcoholate of the Trimer of. A method is described for the purification of the alcoholate of the trimer of hydroxypyruvic acid, whereby the cupric ion is precipitated by oxalic acid instead of by hydrogen sulfide, thus obtaining the trimer free of toxic sulfur derivatives. The quinoxaline derivative, phenylosazone and dioxime were prepared.—WILLIAM E. EVANS, JR., C. JELLEFF CARR and JOHN C. KRANTZ, JR. *J. Am. Chem. Soc.*, 60 (1938), 1628. (E. B. S.)

Mercury Compounds—Organic. By reaction, in solution, of phenylmercury hydroxide with compounds such as barbituric acid, parabanic acid, thiobarbituric acid, xanthine, allantoin or theobromine, antiseptic compounds are formed such as phenylmercury barbiturate (melts above 270° C.), phenylmercury parabanate (melting point above 287° C.), phenylmercury thiobarbiturate (does not melt up to 250° C.), phenylmercury xanthine (decomposes about 360° C.), phenylmercury allantoin (decomposes at 210° C.), and phenylmercury theobromine (melting point 248° to 250° C.). Details are given for the production of these compounds.—CARL N. ANDERSEN, assignor to LEVER BROS. CO. U. S. pat. 2,118,133, May 24, 1938. (A. P.-C.)

β-Phenylethylamine Derivatives. Tertiary and Quaternary Salts. The preparation of a series of compounds consisting of alkoxy- and hydroxy-beta-phenylethyl-dimethylamine hydrochlorides of the type of hordenine is given. The preparation of the quaternary derivatives of these compounds is also given.—JOHANNES S. BUCK, RICHARD BALTZLY and WALTER S. IDE. *J. Am. Chem. Soc.*, 60 (1938), 1789. (E. B. S.)

Radioactive Organic Compound—Synthesis of. α-Glycerophosphoric Acid. Radioactive α-glycerophosphoric acid was synthesized from isopropylidene glycerol and radioactive phosphorus oxychloride. Representative solutions of the glycerophosphoric acid and of phosphoric acid (made from the phosphorus oxychloride originally employed) gave respective counts of 0.797 and 0.815 impulses per minute per mg. of phosphorus.—EDWIN CHARGAFF. *J. Am. Chem. Soc.*, 60 (1938), 1700. (E. B. S.)

Steroids and Sex Hormones. The Splitting Off of Hydrobromic Acid from 2-Brom-Cholestanone and 2-Brom-Androstandione. 2-Brom-cholestanone and 2-brom-androstandione form addition products with pyridine which upon destructive distillation yield Δ^4-cholestenone and Δ^4-androstenedione, respectively. This is due to a smooth running rearrangement which takes place, as these compounds were proven to have been brominated in the 2-position.—L. RUZICKA, A. PLATTNER and R. AESCHBACHER. *Helv. Chim. Acta*, 21 (1938), 866. (G. W. H.)

Sulfamic Acid. A New Industrial Chemical. The acid, HSO_3NH_2, is a strong inorganic acid available in crystalline form. It is stable, nonhygroscopic, odorless and colorless. All of the salts, with the exception of a basic mercury salt, are soluble. It should find extensive use as an analytical reagent.—M. E. CUPERY. *Ind. Eng. Chem.*, 30 (1938), 627–631. (E. G. V.)

Sulfanilamide Derivatives. III. Strepto-*n*-Polysulfanilylsulfanilamides and Related Compounds. A series of *strepto-n*-polysulfanilyl derivatives of aminobenzenesulfonic acids and carboxylic acids, hydroxyalkylamines, sulfonamides and disulfonamides are described. Preliminary results of the pharmacological study of their effect in mice infected with beta-hemolytic streptococci are given. Certain of these compounds are more effective than sulfanilamide, and some appear effective in virus diseases, but caution is expressed against assuming that the results of these preliminary studies in mice are translatable to human therapy.—M. L. CROSSLEY, E. H. NORTHEY and MARTIN E. HULTQUIST. *J. Am. Chem. Soc.*, 60 (1938), 2225. (E. B. S.)

Tocopherols—Structure of Beta and Gamma. Oxidation of beta and gamma tocopherols yielded the same $C_{21}H_{40}O_2$ lactone that had been obtained by Fernholz (1938) from alpha-tocopherol, therefore they differ from the latter only in the absence of one of the three methyl groups attached to the benzene ring.—OLIVER H. EMERSON. *J. Am. Chem. Soc.*, 60 (1938), 1741. (E. B. S.)

1,2,4-Trimethylcyclohexane and an Isononane—Separation of, from a Mid-Continent Petroleum. A fraction of Oklahoma petroleum boiling at 141° C., from which the aromatic hydrocarbons previously had been removed, was separated by distillation at 215 mm. Hg into a fraction containing the bulk of a naphthene constituent and one enriched in paraffins. From the former, nearly pure 1,2,4-trimethylcyclohexane was isolated by crystallization from solution in liquid dichlorodifluoromethane. Continued distillation of the paraffinic fraction at normal pressure, alternated with distillation at 215 mm. Hg, yielded a fraction containing 85 mole per cent of an isononane, probably 2,3-dimethylheptane. The 1,2,4-trimethylcyclohexane constitutes about 0.1%, and the isononane about 0.05% of the original petroleum. Effective separation of a paraffin-naphthene mixture, constant-boiling at normal pressure, by distillation at a different pressure arises from the greater change in boiling point with pressure of the naphthene component. For the hydrocarbons normally boiling near 140° C., the mean interval between boiling points at 760 mm. Hg and 215 mm. Hg is about 42° C. for paraffins, and about 43.2° C. for naphthenes. The boiling points at the two pressures were determined for six hydrocarbons, 2,6-dimethyl-

heptane, a nonanaphthene (boiling at 13.7° C.), 1,2,4-trimethylcyclohexane, 4-methyloctane, 3-methyloctane and 2-methyloctane. The boiling points at these pressures for the "2,3-dimethylheptane" were estimated from values for an impure sample. The boiling point, freezing point, density, refractive index and critical solution temperature in aniline have been determined for the 1,2,4-trimethylcyclohexane and the isononane.—J. D. WHITE and A. R. GLASGOW, JR. *J. Research Natl. Bur. Standards*, 22 (1939), 137. (F. J. S.)

BIOCHEMISTRY

Acetone—Determination of, in Urine. The authors have adapted a special apparatus, (Fleury, *J. pharm. chim.*, 20 (1934), 319, made by Debourges and Grousselle, 3, place Lucien-Herr, Paris (5e)) to the determination of acetone in urine. *Preparation of Urine.*—(Use standard pipettes throughout.) Add exactly 1 cc. of hydrochloric acid to exactly 10 cc. of urine. Fill a pyrex tube (10 mm. by 10 cm.) to within 2 cm. of the top with the acidified urine, dry the mouth of the tube and insert a dry pliable stopper, leaving a cm. of free space in the tube. Immerse in boiling water up to 2 cm. from the top of the tube, let stand for 3 minutes then immerse in cold water. *Fixation of Acetone.*—Place exactly 5 cc. of alkaline mercuric reagent (prepared by mixing equal parts of potassium iodomercurate solution—mercuric chloride 21.6 Gm., potassium iodide 57.6 Gm., water to make 200 cc.—water and sodium hydroxide solution (*d* 1.33)) in the receiving flask. Warm the distillation apparatus, connected with the two reservoirs containing about 3 Gm. of barium sulfate in each, at 37–38° for half an hour, then introduce by the special opening exactly 2 cc. of the prepared urine drop by drop so that it is absorbed by the barium sulfate. Close the opening with the stopper which is greased with the minimum amount of a mixture of vaseline 5 parts, white wax 2 parts and xylol 1 part. After at least 45 minutes at 37–38° place the apparatus in a cold water bath for 10 minutes. *Determination of Acetone.*—All reagents should be added through the special opening. Add exactly 3 cc. of diluted hydrochloric acid (1:1), mix by rocking then cool again in cold water. After 5–6 minutes add exactly 5 cc. of $N/25$ iodine solution and 1 cc. of sodium hydroxide solution (force the liquid out of the pipette as quickly as possible). Mix well, let stand for 15 minutes in cold water, then add 3 cc. of diluted hydrochloric acid (1:1) and 5 cc. of water. Remove the cover of the apparatus and immediately titrate the excess iodine with $N/50$ thiosulfate. Carry out a blank determination starting with addition of hydrochloric acid to the alkaline mercuric reagent. The difference between the number of cc. of $N/50$ thiosulfate used by the blank and the sample $\times$ 0.1934 mg. $\times$ 11/10 gives the mg. of acetone in 2 cc. of the original urine. A urine having 100 mg. of acetone per liter will consume a little less than 1 cc. of $N/50$ iodine.—P. FLEURY and J. CARBOU. *J. pharm. chim.*, 28 (1938), 102–111. (S. W. G.)

Alcohol—Determination of, in Urine. The author has applied the method of Rosenthaler (*Z. analyt. chem.*, (1914), 196) to the determination of alcohol in urine. Procedure: Distil 100 cc. of urine in a small distillation flask, collecting the first 10 cc. of distillate. Transfer 1 cc. of the distillate to a test-tube containing 4 cc. of a solution composed of 1 Gm. of sulfanilic acid in 150 cc. of water and 50 cc. of $N/5$ hydrochloric acid, 1 cc. of 0.7% aqueous sodium nitrite solution and 1 cc. of $N/2$ sodium hydroxide. Mix and heat the contents of the tube. In the presence of alcohol an intense red color appears immediately. A series of standards should be run at the same time, because the color is not stable. This method has the advantage over the iodoform and bichromate methods of being specific. A bibliography is appended.—J. M. HAMBERSIN. *J. pharm. Belg.*, 20 (1938), 741–746. (S. W. G.)

Androsterone Derivatives. The following androgens have been demonstrated in the human or animal organism: (1) Androsterone and trans-dehydro-androsterone in human male urine; (2) Testosterone in bull's testicles; (3) Andrenosterone in the suprarenal glands of bullocks and cows; (4) Androstadienone in the urine of a man suffering from a tumor of the suprarenal gland.—L. RUZICKA. *Pharm. J.*, 141 (1938), 181. (W. B. B.)

Antipernicious Principle. Some Experiments with Urine. Human urine, in health and in untreated pernicious anemia, contains a substance capable of producing a reticulocyte reaction in the white rat. Normal urine, in the case of pernicious anemia described, showed no therapeutic activity.—E. JEQUIER and G. R. M. APSEY. *Brit. Med. J.*, 4061 (1938), 934. (W. H. H.)

Arsenic Compounds—Separation of, from Wines and Sweet Musts by Red Refining. A method based on that proposed by K. Henning is described.—WALTER MEYER. *Deut. Apoth. Ztg.*, 53 (1938), 1064–1065. (H. M. B.)

Ascorbic Acid—Blood, Correlation between, and the Dichlorophenolindophenol Intradermal Test. No correlation between the fasting blood ascorbic acid and the decolorization time of the dichlorophenolindophenol intradermal test was noted in series of 50 adult female patients with active tuberculosis, in 43 of whom hypovitaminosis C existed.—WALTER W. JETTER. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 169. (A. E. M.)

Ascorbic Acid—Diazo Reaction of. Ascorbic acid gives a diazotation reaction with *p*-nitraniline. Through the spectroscope, the color obtained shows a maximum in the zone comprised between 4600 and 4900 Å. When a pure diazo compound is used, it is observed that the reaction is accompanied by a large evolution of nitrogen; this is accounted for by the fact that vitamin C behaves as an alcohol toward the diazo compound, there being the formation of the corresponding aldehyde with liberation of nitrogen. On the other hand both ascorbic aldehyde and ascorbic acid react with the hydrate of the diazo compound to produce an azo compound, with simultaneous liberation of nitrogen. It follows that when tissues give a positive diazo reaction in alkaline medium, account must be taken of certain reducing substances as the color is not necessarily due to phenols or imidazols.—G. BARAC. *Compt. rend. soc. biol.*, 126 (1937), No. 24, 61–62; through *Chimie & Industrie*, 39 (1938), 729. (A. P.-C.)

***l*-Ascorbic Acid—Process for the Manufacture of.** Derivatives of 2-keto-*l*-gulonic acid that are readily hydrolyzable by acids are heated with acids in a substantially anhydrous alcohol solution.—FRANZ ELGER, assignor to HOFFMANN-LAROCHE, INC. U. S. pat. 2,129,317, Sept. 6, 1938. (A. P.-C.)

Autolysis and Putrefaction of Muscle Tissues—Effect of Lactic Acid on the Rate of Post Mortem. Artificial introduction into meat of lactic acid retards the development of putrefying organisms; the Nessler test for ammonia becomes positive only after 96 hours' storage, while in the absence of lactic acid it is positive at the end of 72 hours. On the other hand, introduction of lactic acid intensifies autolysis and increases the total and amino nitrogen contents of the extract. Concentrated milk serum acts in the same way.—S. D. SHESTAKOV. *Voprossy Pitania*, 6, No. 2 (1937), 93–98; through *Chimie & Industrie*, 40 (1938), 143. (A. P.-C.)

Biliary Acids, Sterols, Neutral Saponins, Cardiac Poisons, Hormones and Vitamins—Bonds of Chemical Relationship between. A comprehensive review which is concluded as follows: A large number of natural substances are closely related by their chemical structure to the sterols. All these substances have a cyclopentano-perhydrophenanthrene skeleton. A bibliography is appended.—D. VAN OS. *J. pharm. chim.*, 28 (1938), 115–128, 160–179. (S. W. G.)

Biological Material—Spectrographic Analysis of. A spectrographic method is described for the simultaneous determination of lead, tin, aluminum, copper and silver in biological material. Important improvements in the method include the use of graphite electrodes which are purified by means of a chemical treatment; the use of a step sector which when employed to incorporate the blackening mark in the analytical spectrum also enables a considerable extension of the analytical range; and the use of opacities in place of densities, which improves the accuracy of evaluating faint spectral lines.—J. CHOLAK and R. V. STORY. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 619–622. (E. G. V.)

Biological Preparations—Production of. Fatty acid concentrates containing a high proportion of Laquer's "X-matter," capable of increasing the activity of testosterone, androstanediol or androstanedione, are obtained by submitting fatty acid extracts from animal organs, body fluids or vegetable oils containing lipins to partition between mixtures of solvents which form two phases (for example, light petroleum—70% ethyl alcohol; benzene—60% ethyl alcohol containing alkali; benzene—50% aqueous pyridine), the fatty acids being removed in the non-polar solvent. The concentrated extract is further purified by precipitation with a heavy-metal salt, for example, lead acetate, the soluble portion is then brominated in ether or petroleum, the precipitated bromine compounds are removed and the residue is de-brominated in, for example, methyl alcohol.—NAAML. VENN. ORGANON. Brit. pat. 487,493; through *J. Soc. Chem. Ind.*, 57 (1938), 1101. (E. G. V.)

Bismuth—Determination of, in Biological Materials. The method for detecting small amounts of bismuth in urine, feces and animal tissues is as follows: The urine (100 to 500 cc.) was digested with sulfuric and perchloric acids in a Kjeldahl flask until all the organic material had been destroyed and excess of perchloric acid had been driven off. The digest was diluted to

about 150 cc. with water, 100 cc. of 20% sodium citrate solution were added, and the mixture was made alkaline (p_H 8) by addition of ammonia. Ten cc. of 2% sodium diethyldithiocarbamate solution were added, and the mixture was extracted three times with ether. The combined ethereal extracts were evaporated to dryness in a Kjeldahl flask, and organic material was destroyed by heating with 1 cc. of concentrated sulfuric acid and 1 cc. of perchloric acid. After cooling, the digest was diluted to 5 cc. with water, and 5 cc. of 10% thiourea solution were added. The color was compared with a standard prepared by mixing 5 cc. of a standard solution of bismuth in 20% sulfuric acid with 5 cc. of 10% thiourea solution.—S. L. TOMPSETT, *Analyst*, 63 (1938), 250. (G. L. W.)

Bromosulfalein and Bilirubin Tests of Liver Function. The rate of removal from the blood of injected bromsulfalein and of bilirubin was compared in normal and anesthetized dogs after blockage of the reticulo-endothelial system, after ligature of the bile ducts, and after the injection of decholin. The two tests did not correspond, and it is tentatively suggested that diminished removal of bromsulfalein indicates impairment of the reticuloendothelial system, while diminished removal of bilirubin indicates impairment of hepatic function.—M. A. MILLS and C. A. DRAGSTEDT. *Arch. Intern. Med.*, 62 (1938), 216; through *Brit. Med. J.*, 4059 (1938), 874D. (W. H. H.)

B Vitamins—Consideration of. A review.—H. LINDHOLM. *Arch. Pharm. Chemi.*, 45 (1938), 637–48, 678–703; through *Chem. Abstr.*, 33 (1939), 1021. (F. J. S.)

Citric Acid Determinations in Milk and Milk Products. The author criticizes the pentabromoacetone method of determining citric acid as described in the *A. O. A. C.* methods (1930). The procedure adopted for the determination was essentially that of Lampitt and Rooke (*Analyst*, 61 (1936), 654). The method does not give good results in the presence of considerable quantities of sucrose, maltose or other easily oxidized material. A method of preparation of the sample in the case of sweetened condensed milk, malted milk and milk chocolate is described. Weigh out 20 Gm. of the sample in a wide-necked 100-cc. flask (such as the Reichert type), add 60 cc. of hot water, heat on the water bath and mix thoroughly, add 8 cc. of 50% trichloroacetic acid, mix and heat on the water bath for half-an-hour, shaking occasionally. Cool, make up to 100 cc., filter and measure an aliquot portion of the filtrate (usually 75 cc.) into a 100-cc. beaker. Add phenolphthalein and then sufficient sodium hydroxide solution (at first a strong solution and finally $N/10$) to produce a faint pink tint. Add an excess, usually 10 cc., of neutral lead acetate solution (15%), mix, allow to settle and filter off the precipitate on a Gooch crucible with about 0.1 to 0.2 Gm. of asbestos; after sucking dry, wash with 10 cc. of water. It is not necessary to remove all traces of sugar or to transfer all traces of the precipitate to the filter. Transfer the crucible with the precipitate and asbestos to the beaker previously used, add 70 cc. of hot water and 15 cc. of 50% (by volume) sulfuric acid, stir up the precipiate and asbestos in the acid, warm on the water bath for 15 minutes with occasional stirring, transfer to a 110-cc. (Reichert) measuring flask, cool, make up to the 110-cc. mark with water, and filter off 100 cc. for the determination of citric acid, which will proceed normally after the treatment just described. As regards volume corrections for the precipitates, it was found that for the first precipitate the formula $v = \frac{W}{100}$ $[(1.08 \times F) + (1.55 \times P)]$ where v represents volume of precipitate in cc., W weight of sample in Gm., F percentage of fat in sample, and P percentage of protein (N × 6.38) in sample, gives sufficiently accurate results. For the second precipitate, with the quantities given, the volume of the lead sulfate and asbestos may be taken as 0.4 cc.—P. S. ARUP. *Analyst*, 63 (1938), 635. (G. L. W.)

East Indian Foods—Vitamin B_1 Content of Some. The vitamin B_1 contents of 20 representative East Indian nuts, vegetables and fruits, as determined by animal tests, are recorded for both the raw and cooked states. The majority contain 200–400 international units per Kg. but boengkil katjang tanah (press cake from *Arachis hypogœa, L.*) contains 2000 units.—W. F. DONATH and J. P. SPRUYT. *Geneesk. Tijds. Nederlandsch-Indie*, 78 (1938), 915–934; through *J. Soc. Chem. Ind.*, 57 (1938), 1095. (E. G. V.)

Fumaric, Succinic and Lactic Acids of the Muscle. During autoglycolysis there is an accumulation of lactic acid as well as succinic acid in the muscle; furthermore, a temporary augmentation followed by a diminution of fumaric acid. The results of autoglycolysis and those

obtained *in vivo* contribute to the support of the theory of Szent-Gyorgyi upon the mechanism of respiration.—G. Van Grembergen. *Arch. inter. pharmacodynamie*, 60 (1938), 230. (W. H. H.)

Glucose in Urine—Colorimetric Detection and Estimation of. *Qualitative Test.*—Dilute 2 cc. of defecated urine to a volume of 50 cc., add 5 cc. of the solution to 15 cc. of concentrated sulfuric acid in a porcelain dish, stir and heat for 5 minutes on a boiling water bath; a more or less deep rose coloration indicates glucose. A positive test is obtained with certain normal urines which can contain up to 0.03% of glucose. With experience, one can distinguish by the intensity of the color whether the urine is normal or pathological. *Colorimetric Estimation.*—Prepare standard solutions by pouring 0.2, 0.5 and 0.8 cc., respectively of 0.1% glucose solution into graduated test-tubes, and dilute to exactly 5 cc. in each case; pour the solutions into 50-cc. dishes containing 15 cc. of sulfuric acid and proceed as above. Treat the sample to be analyzed in the same manner, and compare it in a Duboscq colorimeter with the standard solution that is closest in color. Results are very satisfactory.—M. Ragno. *Diagnost. tecnica labor.*, 8 (1937), 81–88; through *Chimie & Industrie*, 39 (1938), 659–660. (A. P.-C.)

Glucose Syrup—Detection of, in Jams and Honey. The freezing point depression of a 10% w/v solution of honey averaged 0.899° C. (14 samples ranged from 0.883° C. to 0.919° C.). Three samples of glucose syrup in 10% w/v solution gave a freezing point depression ranging from 0.402° C. to 0.419° C. Seven samples of commercial jam in 10% w/v solutions gave freezing point depressions ranging from 0.594° C. to 0.722° C. When a 5% w/v solution of glucose syrup after sterilization is fermented at 24–26° C. for from 48–72 hours with 2 Gm. of washed yeast, the alcohol distilled off and the solution clarified with alumina cream it shows a specific rotation, calculated on the original syrup of about +83°. Jams and honey containing no commercial glucose syrup yield a solution by this treatment which is optically inactive or has a small (less than −0.5°) negative rotation.—G. D. Elsdon. *Analyst*, 63 (1938), 422. (G. L. W.)

Hematopœtic Hormone—Existence of, Proved by Production of Polyglobulin. The possibility of producing polyglobulin in normal rats by the oral administration of fresh or acetone defatted powdered anterior pituitary (4 to 6 weeks) was studied. Cases, few in number, of polyglobulin were observed likewise in rats deprived of anterior pituitary. There was diminution and the delayed appearance of polyglobulin (2 weeks) following the oral administration of an acid extract of the acetone-treated powder. There was strong reticulocytic action of albumen-free extracts of the anterior lobe, deprived of the growth, gonadotropic and thyrotropic hormones, when administered parenterally. From the above statements, as well as the modification in the bone marrow and reticulocytes following the removal of the various hormones from the anterior pituitary, the existence in the pituitary of a special hematopœtic hormone is believed. J. Flaks, I. Himmel and A. Zotnik. *Presse méd.*, No. 82 (1938), 1506. (W. H. H.)

Hemolytic Properties of Meat. Alcoholic extracts of freshly slaughtered meats possess no hemolytic properties; they acquire them as the meat ages and changes. These hemolytic properties of the alcoholic extracts depend on the free fatty acids which accumulate in the course of the decomposition of the intermuscular and intracellular fat. The hemolytic value of the extracts increases along with the other physico-chemical and bacteriological values of the meat. The limit of the hemolytic value of fresh meat is 10. Determination of the hemolytic value furnishes a sensitive method of evaluating the quality of meat.—L. A. Arutyunyan. *Voprosy Pitaniya*, 6 (1937), No. 2, 43–58; through *Chimie & Industrie*, 40 (1938), 142. (A. P.-C.)

Hormones. A process for the production of substances having the properties of Δ^5-pregnenolone and Δ^5-isopregnenolone comprises condensing dehydroandrosterone with ethyl α-chloropropionate in the presence of an alkali metal alcoholate, removing unchanged dehydroandrosterone by treatment with semicarbazide hydrochloride, washing the ether solution from the semicarbazone with alkali solution, drying, hydrolyzing the residue, adding ether and water, drying the ether layer, treating the partially crystallized residue with acetic anhydride and refluxing to convert the hydroxyketones present into the corresponding acetates, treating the semicarbazide hydrochloride and hydrolyzing the semicarbazone acetate to obtain the physiologically active ketone mixture.—Everett S. Wallis and Willis A. Yarnall, assignors to Merck & Co. U. S. pat. 2,123,217, July 12, 1938. (A. P.-C.)

Hormones and Allied Substances—Multiple Biological Activities of. The gonadal hormones and allied substances fall into three classes; the oestrone group, the progesterone group

and the androsterone-testosterone group. The substances of the first group, of which the better known are oestrone, oestradiol and oestriol, have primarily the power to evoke in the female reproductive tract the changes characteristic of the time of ovulation. In the male, these substances have an effect on the reproductive organs, causing metaplasia of the epithelium or hypertrophy of the fibrous tissue, or both, according to the species of animal and the duration of treatment. Progesterone has primarily the power to cause progestational changes in the female reproductive tract. The compounds of the androsterone-testosterone group comprise three compounds which have been isolated from natural sources and a large number which have been prepared artificially.—A. S. PARKES. *Pharm. J.*, 141 (1938), 182. (W. B. B.)

Hypnotics—Practical Method for Identifying Certain, in the Viscera. By heating 0.1 Gm. of hypnotic substances in small porcelain capsules on a sand bath, typical sublimation crystals were obtained on a glass slide in the case of trional, sulfonal, tetronal, proponal, phanodorn, dial, barbital and phenobarbital. Any resinous admixture formed is removed by a drop of xylene. In a given case of lethal poisoning, the contents of the stomach and spleen were examined by the Fabre and Fredet method (*Bull. soc. chim. biol.*, 7 (1925), 1071–1084); the product of proteinolysis was free from fat by petroleum ether, then shaken out with excess ether which left 0.2294 Gm. of a crystalline residue. A small part of it upon microsublimation gave crystals of barbital, further identified by its melting point and chemical tests.—M. J. PAPAVASSILIOU and S. N. LIBERATO. *J. pharm. chim.*, 25 (1937), 586–595; through *Chimie & Industrie*, 39 (1938), 867. (A. P.-C.)

Iodide—Losses of, from Iodized Salt. Iodized salt when stored under the usual conditions of storage in warehouse and shops for six months loses iodide by absorption into the cardboard or fabric of the container. A sample containing 1.5 parts in 250,000 when packaged should, however, contain at least 1.0 part in 250,000 at the end of six months. The loss is proportionately greater from small cardboard containers than from larger cloth bags. The loss is proportionately greater from the bottom of the container than from the top.—R. L. ANDREW. *Analyst*, 63 (1938), 179. (G. L. W.)

Insulin Composition for Injection. A material suitable for subcutaneous injection in animals and man includes a suspension of insoluble insulin histone composition (suitably with a p_H of about 7.4).—FRITZ E. BISCHOFF. U. S. pat. 2,121,900, June 28, 1938. (A. P.-C.)

Insulin Response—Analysis of, of Rabbits after Injection of Diabetic Serum. The response of rabbits to insulin before and after the injection of diabetic serum has not afforded a means of distinguishing different types of diabetes. The inhibition of the response of the blood sugar to insulin after the injection of pituitary extract has been confirmed.—F. C. DOHAN. *Proc. Soc. Exptl. Biol. Med.*, 39, 24 (1938). (A. E. M.)

Inulin—Colorimetric Method for the Determination of, in Blood Plasma and Urine. The procedure described for the determination of inulin in blood plasma and urine depends on the colorimetric determination of the levulose formed from inulin by acid hydrolysis according to Roe's method (*C. A.*, 29, 1126) based on the Seliwanoff reaction. Hydrolysis by 10*N* hydrochloric acid requires only 8 minutes at 80°. A green filter of 510 mμ is used. Five mg. % of inulin can be determined. For the determination of the glomerular filtration it is sufficient to give a man of 70 Kg. 10 Gm. of inulin to obtain plasma values of 20–40 mg. % after one hour.—K. STEINITZ. *J. Biol. Chem.*, 126 (1938), 589–593; through *Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

Iodine—Determination of, in Biological Materials. The organic matter in the sample (blood, urine, dried food, thyroid, etc.) is oxidized with excess chromium trioxide in a distillation flask, the iodine distilled and oxidized with permanganate and finally the iodine liberated from added potassium iodide is titrated with thiosulfate.—N. L. MATTHEWS, G. M. CURTIS and W. R. BRODE. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 612–615. (E. G. V.)

Lecithin and Luteine—Bleaching of, in Egg Extract by Sunlight and Heat. A partial bleaching of 5% suspensions of egg extract (lecithin and luteine) in physiological serum in ampuls prepared according to Vita and Bracaloni (*J. pharm. chim.*, 24 (1936), 558) was obtained on exposing the ampuls to sunlight or by heating in water at 70° C. This has been found to have no effect upon the therapeutic value of the preparation. Intramuscular injection of the partially bleached suspension into man in doses as high as 10 cc. causes no local or general disturbances.

Intravenous injection of 10 cc. of the same suspension into rabbits is tolerated perfectly.—L. BRACALONI. *J. pharm. chim.*, 28 (1938), 97–102. (S. W. G.)

Liver Extracts—Jacobsen Method for Assay of. The reticulocyte response in guinea pigs is not a sufficiently sensitive test for the evaluation of the antianemic principle.—R. RODRIGUEZ-OLLEROS and R. RODRIGUEZ-MOLINA. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 174. (A. E. M.)

Liver Extracts—Process of Preparing. In order to free liver extract of impurities, a paste of the water-soluble constituents of liver is mixed with 60 to 80% alcohol and cooled to not over −15° F., at which temperature it is maintained sufficiently long to ensure complete precipitation of substances insoluble at this temperature. The precipitate is then separated from the alcoholic solution.—HARVARD L. KEIL, assignor to ARMOUR & Co. U. S. pat. 2,125,844, Aug. 2, 1938. (A. P.-C.)

Lumisterol—Constitution of, and of the Products Resulting from the Heating of Vitamin D_2 (Calciferol). Ergosterol and its stereoisomer, iso-pyrocalciferol, differ only in the stereo-arrangement of their C_9 atom, all the other double bonds being the same, as well as the arrangement of the other carbon atoms. On the other hand, lumisterol differs also from its stereoisomer, pyrocalciferol, solely by the stereo-arrangement of their C_9 atom. Ergosterol and iso-pyrocalciferol on the one hand, and lumisterol and pyrocalciferol on the other, differ in the position of the methyl group attached to the C_{10} atom.—A. WINDAUS and K. DIMROTH. *Ber. deut. Chem. Ges.*, 70 (1937), 376–379; through *Chimie & Industrie*, 39 (1938), 722. (A. P.-C.)

Manioc—Vitamin B Complex in. After a long review of the vitamins B_1, B_2, B_3, B_4 and B_5, the author gives the following conclusions: (1) The flour and the starch of manioc contain an appreciable amount of vitamin B_1, but none of the flavine of the B_2 complex. (2) The flavine exists in a very large proportion in the fresh manioc, but is destroyed by the preparation of the flour or starch. (3) The fresh crude manioc notably augments the growth of rats. (4) Rats whose growth was arrested by a diet minus vitamin B plus the flour or starch, responded immediately to brewer's yeast. (5) Augmentation of the duration of nystagmus does not appear to constitute an early indication of "avitaminosis B_1."—F. A. De MOURA CAMPOS. *Rev. flora med.*, 4 (1938), 510; through *J. pharm. Belg.*, 20 (1938), 668. (S. W. G.)

Medical Chemistry—Notes on. A critical review of different analytical methods employed in biochemical determinations. Procedures for the determination of the following are discussed: urinary albumen; uric acid in urine; chlorides in urine; glucose in urine; total urinary nitrogen; provoked galactosuria; urinary urobilin; chlorine (corpuscular and plasmatic) in blood; cholesterolytic power; sugar in blood; plasmatic residual color index.—F. V. *J. pharm. Belg.*, 20 (1938), 589–591, 611–614, 629–632, 648–650, 665–668. (S. W. G.)

Milk—Irradiation of. Factors Affecting Antirachitic Response. The high-pressure air-cooled mercury arc in quartz produces a maximum vitamin D synthesis at a 6-inch distance on the normal from the center of flowing milk films. All effective radiation is utilized by a film whose width is no more and length is no less than twice the perpendicular distance to the arc. The vitamin D potency of irradiated milk has a parabolic relation to the amount of active radiation applied. This relation is slightly different for different distances from arc to film, but holds for any other method used to vary the amount of applied energy, such as changing the radiation intensity, the film capacity or the number of successive exposures.—H. H. BECK, H. C. JACKSON and K. G. WECKEL. *Ind. Eng. Chem.*, 30 (1938), 632–639. (E. G. V.)

Nicotinc Acid in the Prevention of Blacktongue of Dogs. Recession of acute symptoms of blacktongue followed the administration of either sodium nicotinate of nicotinic acid. The total quantity of nicotinic acid necessary to cause the acute symptoms of blacktongue to subside is 20–60 mg. The wide variation in the amount of nicotinic acid required to prevent recurrence of the acute symptoms of blacktongue suggests that some factor other than body weight may be involved. A semi-weekly dose of 3.0 mg. of nicotinic acid is barely sufficient to prevent blacktongue; a dose of 10 mg. prevented the disease for at least six months.—W. H. SEBRELL, R. H. ONSTOTT, H. F. FRASER and F. S. DAFT. *J. Nutrition*, 16 (1938), 355–362; through *Chem. Abstr.*, 33 (1939), 1014. (F. J. S.)

Nicotinic Acid—Influence of, on the Fermentation Method for Vitamin B_1 Determination. The effect of nicotinic acid is shown to be small, but significant, and the authors recommend in-

cluding the acid in all determinations.—A. S. SCHULTZ, L. ATKIN and C. N. FREY. *J. Am. Chem. Soc.*, 60 (1938), 1514. (E. B. S.)

Oxidizing Agents—Test for Traces of, in Milk. The authors have modified the Rupp test for chlorine in milk and cream and have determined that the reaction used by them depends upon the presence of chlorate in the hypochlorite solutions used as a source of chlorine. The test is sensitive to 12 p. p. m. of chlorine in milk. The test is described as follows: *Milk.*—To 3 cc. of milk in a 3/4 in. test-tube, cooled to 0–5° C., are added 3 cc. of 73.5% sulfuric acid containing 0.025% of stannous chloride, also cooled to 0–5° C. The contents of the tube are well shaken in a freezing mixture of ice and salt and allowed to stand in this mixture for 3 minutes. The contents are transferred to a 12.5-cc. centrifuge tube and spun for 3 minutes at 2500 r. p. m. The tubes are immediately examined in ultra violet light for the presence of any yellow fluorescence. *Cream.*—One cc. of cream is diluted with 1.3 cc. of water and the above test applied with the exception that the centrifuging is done at 4000 r. p. m.—R. C. WRIGHT and E. B. ANDERSON. *Analyst*, 64 (1938), 252. (G. L. W.)

Sexual Hormone Preparation. A crystalline hormone preparation, having a melting point of 174° C., containing a ketone group, soluble in a mixture of benzene and ligroin, and possessing a capon unit in about 10 to 20 gamma, is obtained from acetyldihydrocinchol through oxidation, forming the semicarbazone and splitting the latter. Various details of procedure are given.—WILHELM DIRSCHERL, assignor to RARE CHEMICALS, INC. U. S. pat. 2,125,772, Aug. 2, 1938. (A. P.-C.)

Sodium Pregnanediol Glucuronidate—Further Studies on the Estimation of Small Amounts of, in Urine. Further improvements in the technic for the gravimetric determination of sodium pregnanediol glucuronidate previously described are reported and the difficulties encountered in the estimation of small quantities are discussed in detail. In order to detect small amounts of the compound in urine from the menstrual cycle, particularly in abnormal cases in which the amounts are usually low, sufficient urine must be extracted so that the total content of the compound in the sample is at least 4–5 mg. and even then such small amounts can only be approximated.—E. H. VENNING. *J. Biol. Chem.*, 126 (1938), 595–602; through *Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

Sterols. XXXV. Carbinols from Stallious Urine. Stallious urine gives a carbinol fraction from which a saturated β-sterol of the allo series is obtained. This sterol, β-equistanol, yields β-equistanone on oxidation. The presence of the epimer, α-equistanol and of two triols is also shown. One of these triols yields uranetrione on oxidation, but the other triol is probably of the allo series. It also gave a compound of the composition of an allo-pregnanetetrol.—RUSSELL E. MARKER, ELMER J. LAWSON, EWALD ROHRMANN and EUGENE L. WITTLE. *J. Am. Chem. Soc.*, 60 (1938), 1555. (E. B. S.)

Sterols. XLII. Isolation of Oestranediols from Human Non-Pregnancy Urine. From the urine of non-pregnant women has been isolated two isomeric oestranediols. This constitutes further evidence that the oestrogenic hormones suffer the same reductive process as do other sex and cortical hormones when they are utilized. Both oestranediols on dehydrogenation with platinum black yielded equilenin.—RUSSELL E. MARKER, EWALD ROHRMANN, ELMER J. LAWSON and EUGENE L. WITTLE. *J. Am. Chem. Soc.*, 60, (1938), 1901. (E. B. S.)

Sterols. XXXVI. Ketones from Mares' Pregnancy Urine. From the ketonic fraction of mares' pregnancy urine was obtained and characterized the following ketones: allo-pregnanedione, allo-pregnanol-3(β)-one-20 and uranol-11-one-3 in addition to a ketone, $C_{19}H_{26}O_3$, m. p. 252°, reported by Heard.—RUSSELL E. MARKER, ELMER J. LAWSON, EUGENE L. WITTLE and HARRY M. CROOKS. *J. Am. Chem. Soc.*, 60 (1938), 1559. (E. B. S.)

Sterols. XL. Origin and Interrelationship of the Steroidal Hormones. A very clear discussion is given of the probable relationship existing between the hormones, based on the nature of the known hormones and the reduction products of the hormones which have been isolated. The author, from known compounds and facts, traces these hormones back to a common precursor, which he suggests, "may be the as yet unisolated cortical hormone." Charts showing structural relationships and courses of reduction *in vivo* are given. Fifty-four references are given.—RUSSELL E. MARKER. *J. Am. Chem. Soc.* 60 (1938), 1725. (E. B. S.)

Sterols. XXXVIII. Pregnanediol in Mares' Pregnancy Urine and Its Conversion into Progesterone. The isolation of pregnanediol-3(β), 20(α) and allo-pregnanediol-3(β), 20(α)

are reported. Pregnanediol-3(β), 20(α) upon oxidation gave progesterone and upon catalytic reduction gave allo-pregnanediol-3(β), 20(α). β-Equistanol, previously obtained from stallion urine, has now been detected also in mares' pregnancy urine.—RUSSELL E. MARKER and EWALD ROHRMANN. *J. Am. Chem. Soc.*, 60 (1938), 1565. (E. B. S.)

Sterols. XLI. Reduction of Naphtholic Steroids to Phenolic Steroids. Equilenin. Equilenin, on reduction by aluminum isopropylate, gives a mixture of alpha- and beta-dihydroequilenin, which may be separated by crystallization. The latter compound is identical with the δ-follicular hormone. The alpha compound does not precipitate with digitonin. It has an œstrogenic potency of 250 R. U. per mg. and the beta compound 75–100 R. U. per mg. On reduction of the isomeric dihydroequilenins by sodium in amyl alcohol about 20% of phenolic substances are formed and alpha- and beta-œstradiol are obtained from the alpha and beta-dihydroequilenins respectively.—RUSSELL E. MARKER. *J. Am. Chem. Soc.*, 60 (1938), 1897. (E. B. S.)

Sterols. XXXIX. Reduction of Uranetrione. Uranetrione gave on reduction uranediol, a new triol and uranol-3-β-dione-11,20.—RUSSELL E. MARKER, EUGENE L. WITTLE and THOMAS S. OAKWOOD. *J. Am. Chem. Soc.*, 60 (1938), 1567. (E. B. S.)

Sterols. XXXVII. Uranediol from Mares' Pregnancy Urine. The isolation of uranediol is reported and its structure shown to be uranediol-3(β),11. On oxidation it yields uranedione.—RUSSELL E. MARKER, EWALD ROHRMANN and EUGENE L. WITTLE. *J. Am. Chem. Soc.*, 60 (1938), 1561. (E. B. S.)

Sugar Mixtures—Analysis of. Previous studies on the determination of dextrose and levulose had been extended to mixtures also containing maltose and lactose. In the proposed method the total reducing sugars are determined by means of Fehling solution, the monosaccharides with Steinhoff's modification of Barfoed's reagent, and levulose by the method of Jackson and Mathews. Lactose is found by oxidation to mucic acid, or preferably by copper reduction after fermenting off the other sugars. Four equations are thus obtained from which the percentage of each sugar can be calculated. It has been found that both maltose and lactose have a slight reducing effect on Steinhoff's reagent as well as on Jackson and Mathews' reagent, and it is necessary to apply corresponding corrections. The quantities of dextrose, levulose and lactose found in known mixtures agree well with those taken, but the result for the maltose is less reliable because it is obtained by difference.—F. W. ZERBAN and L. SATTLER. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 669–674. (E. G. V.)

Thymonucleic Acids. Glandular material, such as thymus glands, containing nucleic acids, is subjected to alkaline hydrolysis, as by heating in a 3% sodium hydroxide solution to form a reaction mixture containing nucleic acid salts, and the mixture is treated with sulfuric acid.—HARVARD L. KEIL, assignor to ARMOUR & CO. U. S. pat. 2,122,651, July 5, 1938. (A. P.-C.)

Thymus Gland. A review.—A. RICHARD BLISS, JR. *Drug Cosmetic Ind.*, 43 (1938), 420–422. (H. M. B.)

Thyroxin—Process of Preparing. Iodine is gradually added in small portions and in a quantity which in all is insufficient for the complete iodination of the protein, to an aqueous solution of protein of a p_H value of about 7 to about 9 and at a temperature of about 40° C. The thyroxin is separated from the iodinated protein by hydrolysis, precipitated with an acid and purified by recrystallization.—CARL L. LAUTENSCHLAGER, WILLY LUDWIG and PAUL VON MUTZENBECHER, assignors to WINTHROP CHEMICAL CO., INC. U. S. pat. 2,130,985, Sept. 20, 1938. (A. P.-C.)

Tryptophan—Determination of, by a Modified Glyoxylic Acid Method Employing Photoelectric Colorimetry. An accurate and reliable method for the estimation of tryptophan is described. It is based on the glyoxylic acid reaction, and involves the use of the Evelyn photoelectric colorimeter. The technic makes it possible to ascertain readily whether the color being measured is due only to tryptophan. The method has been applied to casein, of which, if necessary, only 25 mg. is required. The tryptophan is readily determined on a solution obtained by dissolving the casein in 10 or 20% sodium hydroxide or 5% formic acid by heating for a few minutes. With respect to alkali hydrolysis of casein under pressure, tryptophan is unstable in the sodium hydroxide hydrolysis, but is very stable in the baryta hydrolysis. The age and source of the casein are shown to be factors causing variations in the tryptophan content of different samples of casein.—J. L. D. SHAW and W. D. MCFARLANE. *Can. J. Research*, 16, B (1938), 361–368; through *Chem. Abstr.*, 33 (1939), 505. (F. J. S.)

Urea—Further Notes on a New Colorimetric Technic for the Estimation of, in Urine. Pipette 0.2 cc. of urine into a small test-tube. Add to this 1 cc. of a 10% solution of stannous chloride in concentrated hydrochloric acid (this solution is not stable and should be kept on ice when not in use) and 0.3 cc. of a mixture made by dissolving 0.3 cc. of freshly distilled furfuraldehyde in 7 cc. of glacial acetic acid and made up to 21 cc. with 5% gum ghatti solution. Mix the contents of the tube and allow to stand at room temperature for thirty minutes. (If the room temperature is below 10° C., forty-five minutes; if above 20° C., twenty minutes are sufficient.) An intense purple color develops. Add 4 cc. of a mixture of 3 parts of 30% sodium acetate and one part of 5% gum ghatti solution, mix and allow to stand thirty minutes. The color changes from purple to golden-brown. Compare in a colorimeter with a standard color developed from a known solution of urea or read the depth of color in terms of extinction coefficient or optical density with a photometer. With ordinary concentrations the accuracy with a colorimeter is ±2%.—E. OBERMER and R. MILTON. *Analyst*, 63 (1938), 423. (G. L. W.)

Vegetables—Microbiological Methods for the Examination of Canned. Suggested methods for the examination of non-acid and semi-acid canned vegetables are described, dealing with physical examination and preparation of the can, removal of sample and culture media.—E. J. CAMERON. *J. Assoc. Official Agr. Chem.*, 21 (1938), 452–454. (A. P.-C.)

Vitamin A Concentration—Apparatus for Measuring. Vitamin A is determined by measuring the absorption of filtered light from a sodium-vapor lamp.—RONALD L. MCFARLAN and JAS. W. REDDIE, assignors to UNITED DRUG CO. U. S. pat. 2,123,573, July 12, 1938. (A. P.-C.)

Vitamin A—Iodometric Determination of. Iodometric titration of vitamin A with decinormal iodine gives results agreeing with those obtained by the Carr-Price colorimetric method.—V. SOLJANIKOWA-NIKOLSKAJA. *Z. Vitaminforsch.*, 6 (1937), 117–119; through *Chimie & Industrie*, 39 (1938), 728. (A. P.-C.)

Vitamin A—Oxidation of. Oxidation of vitamin A by aluminium tertiary-butoxide in the presence of diethylketone gave a C_{20} aldehyde in the form of a yellow oil. Subsequent reduction failed to yield vitamin A but a similar, physiological active compound was obtained which the authors showed to bear a resemblance to vitamin A in several respects.—E. HAWORTH, I. M. HEILBRON, W. E. JONES, A. L. MORRISON and J. B. POLYA. *J. Chem. Soc.*, (London) (1939), 128. (W. T. S.)

Vitamin B_1—Estimation of Blood. The Schopfer phycomyces test has been applied to the estimation of vitamin B_1 in the blood. The modified method described can be adapted as a reasonable test for vitamin B_1 nutrition, and appears to be the best method at present available for dealing with the small quantities of vitamin B_1 in the blood, but it is too laborious and exacting in the technic to serve as an ordinary routine laboratory method. The range for the vitamin B_1 content of blood in eight normal subjects was 6.5 to 16.5 μg. per 100 cc. From the authors experiments vitamin B_1 was found to be present in normal amounts in the blood of patients with subacute combined degeneration of the spinal cord, polyneuritis (excluding that due to alcohol and malnutrition), pernicious anemia without neurological involvement before and after treatment, and secondary microcytic anemia. Gross deficiencies were present in alcoholic neuritis (4 μg. per 100 cc.), nutritional neuritis (3.5 and 4.5 μg. per 100 cc.), scurvy (4.8 and 5.5 μg. per 100 cc.), and malnutrition (4.7 μg. per 100 cc.); partial deficiencies were noted in simple achlorhydric anemia (5.3 μg. to 6 μg. per 100 cc.).—E. N. ROWLANDS and J. F. WILKINSON. *Brit. Med. J.*, 4060 (1938), 878. (W. H. H.)

Vitamin B_1—Hydration of. The degree of hydration of vitamin B_1 at 25° was determined gravimetrically at sixteen different aqueous pressures in the range between 1 and 19 mm. It was necessary to crystallize the vitamin by a standard procedure in order to obtain reproducible results. The degree of hydration was found to increase continuously from approximately 0.4% of water at 1 mm. to 5.2% at 19 mm. At the aqueous pressure of the saturated solution (20.9 mm.), the degree of hydration of the solid vitamin corresponds approximately to one molecule of vitamin.—W. A. BASTEDO, JR., N. R. TRENNER and T. J. WEBB. *J. Am. Chem. Soc.*, 60 (1938), 2303. (E. B. S.)

Vitamin B_1—Process for the Manufacture of. Vitamin B_1 is manufactured by reacting 2-methyl-2-alkoxy-3-chloro-tetrahydrofurane with 2-methyl-4-amino-5-thioformylaminomethyl pyrimidine.—MAX KLINGENFUSS, assignor to HOFFMANN-LAROCHE, INC. U. S. pat. 2,127,446, Aug. 16, 1938. (A. P.-C.)

Vitamin B_1—Standardized Method for the Determination of. On the basis of the data submitted, especially when appraised in comparison with the performance and response of groups of animals submitted to similar tests but with less control and standardization of the dietary components and supplements, it appears that the vitamin B_1 determination involving the specificity of the polyneuritic reactions may be standardized by employing a comparatively simple basal diet supplemented with pure entities or proved concentrates as the source of other dietary essentials.—G. C. SUPPLEE and R. C. BENDER. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 636–638. (E. G. V.)

Vitamin B_1—State of, in Blood. In human blood there is practically no free vitamin B_1, but warming above 60° liberates it. Since cocarboxylase estimates as free vitamin B_1 by Schopfer's method, the vitamin cannot be present in blood as the pyrophosphoric ester, but must be bound so that it is not available to the fungus. It is probably bound to protein and is possibly first phosphorylated. The rate at which this combination occurs can be tested by injecting the vitamin and estimating the free and combined vitamin in the blood at subsequent intervals.—H. M. SINCLAIR. *Chemistry and Industry*, 57 (1938), 471. (E. G. V.)

Vitamin B_1 and Its Synthetic Analogues. With a view of determining the structural features necessary for vitamin activity, a number of synthetic analogues have been prepared. The results of this work indicate a remarkable structural specificity, for, apart from alteration in the nature and position of the alkyl substituent on the pyrimidine nucleus, any change in the vitamin molecule destroys the physiological action almost completely.—A. R. TODD. *Pharm. J.*, 141 (1938), 182. (W. B. B.)

Vitamin C—Chemical Determination of, Function and Distribution in Vegetable Tissues. A review and description of the various methods.—M. VISCONTINI. *Bull. soc. sci. hyg. aliment.* 26 (1938), 215–230. (A. P.-C.)

Vitamin D in Foodstuffs. A Discussion of Policy. The distribution and human requirements of vitamin D are discussed, together with the vitamin intake supplied by food. The author does not believe that as a general rule vitamins should be added to foodstuffs, but that it is better to choose one single foodstuff as the recognized vehicle for each vitamin.—A. W. KNAPP. *Chemistry and Industry*, 57 (1938), 558–561. (E. G. V.)

Vitamin-Containing Fish Oils—Partially Hydrogenated. A partially hydrogenated vitamin-containing fish oil (such as cod liver oil) having a melting point within the range from about 30° to about 45° C., and free from objectionable odor and taste and tendency to form gummy products when exposed to the air, is obtained by hydrogenating a vitamin-containing fish oil under a hydrogen pressure materially above atmospheric in the presence of a highly active nitrogen catalyst at a materially elevated temperature not exceeding about 125° C. while violently agitating the oil so as to shower or spray it in contact with hydrogen.—ALEXANDER D. BARBOUR, assignor to the ONTARIO RESEARCH FOUNDATION. U. S. pat. 2,125,215, July 26, 1938. (A. P.-C.)

Vitamins. IV. Chemical and Physical Properties. A discussional survey of the vitamins for the practicing pharmacist. Among those vitamins discussed are: vitamin A, vitamin B_1 and B_2, nicotinic acid, vitamin C, vitamin D, vitamin E. Vitamin A and its precursors are said to be stable to heat, in the absence of oxidizing agents. Vitamin B_1 is fairly stable in aqueous solutions in the presence of weak acids, and it is not destroyed when heated for several hours at temperatures below 100° C. in neutral or acid media, but it is destroyed above 120° C. Vitamin B_2 (riboflavin) is stable in acid solutions, but is affected by alkalis. Nicotinic acid is an oxidation product of nicotine. Vitamin C (ascorbic acid) is fairly stable to heat in the absence of oxygen, but is unstable to heat in the presence of air or oxygen, especially in neutral or alkaline solutions. Vitamin D in the form of calciferol dissolved in olive oil, cod liver oil, halibut liver oil or in liquid paraffin is unchanged or at most only slightly changed after fifteen to twenty months' storage. Vitamin E is stable at high temperatures (up to 250° C.) in the dry state.—ANON. *Pharm. J.*, 141 (1938), 391. (W. B. B.)

Vitamins and Hormones in Plants—Biological Significance of. A discussion of the physiological significance which can be attributed to vitamins A, D, C, B_1 and B_2, and also ergosterol (provitamin D, and also considered to be the pro(ovarian hormone)) in plants, together with a review of the chief facts relative to the biological action of the growth hormones of green plants, natural and synthetic heterauxines. The principal distinctive characteristics of the growth

hormones of green plants offer striking analogy with those of animal hormones.—N. BEZSSONOFF. *Compt. Rend. 17me Congr. Chim. Ind., Paris* (Sept.-Oct. 1937), 881-890. (A. P.-C.)

Vitamins. I. Nomenclature. The known vitamins are classified as follows: *Vitamin A:* the term includes vitamin A proper and the pro-vitamins A—*alpha, beta* and *gamma* carotenes and kryptoxanthine. *Vitamin B Complex:* includes vitamin B_1, vitamin B_2 (G), riboflavin, P-P factor, filtrate factor and nicotinic acid, vitamin B_3, vitamin B_4, vitamin B_5, vitamin B_6. *Vitamin C:* known as ascorbic or cevitamic acid. *Vitamin D:* variously known as irradiated ergosterol, calciferol (vitamin D_2), irradiated 7-dehydro-cholesterol (vitamin D_3). *Vitamin E:* known as the anti-sterility or anti-abortion factor. *Vitamin K:* known as the anti-hemorrhagic vitamins in chickens. *Vitamin P:* a flavone or flavonol glycoside. *Vitamin F:* known as linoleic acid. A comprehensive table is given which outlines the units of measurements used in the determination of potency of vitamins, and compares these units with each other.—ANON. *Pharm. J.*, 141 (1938), 179. (W. B. B.)

Vitamins. V. Physiological Action and Signs of Deficiency. A general discussional survey for the practicing pharmacist. When large doses of vitamin A are taken by mouth, the liver is able to store an amount far in excess of the body's immediate needs, and this excess is utilized in times of vitamin A deficiency. Chronic infections, nephritis and other diseases of the bladder and kidney diminish the vitamin A reserves. After oral administration of vitamin A, storage reaches a maximum in three to four hours, the excess being either excreted in the feces or destroyed. The characteristic effect of vitamin A deficiency is shown in changes in the epithelial cells which form a lining to many structures in the body. The wide distribution of vitamin B_1 in the human body suggests that it has an important rôle in the functioning of every cell, rather than in the activity of special organs or of specialized tissues. Symptoms associated with vitamin B_1 deficiency are associated with disturbances of the functions of the nervous system, the gastro-intestinal tract and the blood-forming mechanism. Long continued deficiency leads to changes in nerve fibers so that neuritis is a frequent symptom of mild or even moderate deficiency. Vitamin C (ascorbic acid) deficiency has become rare since the value of fresh vegetables and fruit juices has been recognized. Deficiency of vitamin C leads to structural changes in the teeth of animals, a fact which has been utilized as a method of biological assay. Without a sufficient vitamin D, calcium salts are not laid down in the bones which thus become soft and rickets results. Although direct proof of the effects of vitamin E on the physiological processes in the human species is lacking, there are strong grounds for believing that deductions made from animal experiments are applicable to man.—ANON. *Pharm. J.*, 141 (1938), 440. (W. B. B.)

Vitamins. III. Requirements of Human Subjects. Recommendations have been made of 1500 international units per day of vitamin A as the minimum requirements for infants and 2000 to 2500 international units as a suitable daily allowance. A diet which meets average minimum requirements in other respects is adequate for adults if it provides from 3000 to 6000 international units of vitamin A per day. Diets calculated to contain at least 5000 international units of vitamin A daily are recommended for pregnant and nursing women. The amount of vitamin B_1 necessary depends not only upon the age and weight of the individual, but also upon the calorie value of the food, and can be expressed in the form of an equation:

$$\frac{\text{Daily requirements of vitamin } B_1}{\text{Daily total energy exchange}} = \text{Body weight in Gm.} \times \text{a constant}$$

The vitamin requirements are expressed as "mg. equivalents" (1 international unit = 20 mg. equivalents) and the constant for humans = 0.0000284. On this basis an adult consuming 2500 to 3000 calories, requires from 300 to 375 international units of vitamin B_1 per day. The vitamin B_1 requirements of children are greater in proportion to body weight than those of adults, and during pregnancy and lactation, women need from three to five times the normal amount. It is probable that the body requires approximately 0.04 mg. of riboflavin per day for optimum growth. On the basis of the capillary resistance test it has been estimated that the absolutely indispensable minimum daily requirement of a healthy adult is from 0.39 mg. to 0.48 mg. of ascorbic acid per Kg. of body weight. Tests for vitamin C excretion lead to the conclusion that the requirements for this vitamin are greater in childhood than in adult life, they are even greater during pregnancy, and greatest of all during lactation. During pregnancy a woman requires from 100 to 300 mg. of vitamin C daily; from 5 to 10 mg. daily is necessary to protect an infant from scurvy, and from

100 to 150 mg. are necessary to meet the normal vitamin C requirements of a child of pre-school age. The average adult requires from 25 to 75 mg. daily of vitamin C. As there is at present no means of detecting the presence of vitamin D in blood and excreta, data concerning the body's daily requirements of this vitamin are lacking. Furthermore, the constant synthesis of vitamin D in the skin under the influence of sunlight renders it difficult to compare quantitative clinical tests. The amount of vitamin D required to prevent rickets in infants has been established at different levels by different workers, the quantity having been assessed ranging from 135 to 1125 international units daily. For premature infants and for babies whose growth rate exceeds the normal, 4500 units is suggested as a suitable dose for the first four months of life, after that the dose may be reduced to 1125 units of vitamin D daily. The daily amount of vitamin D needed by an adult has been estimated as from 250 to 700 international units and for women during pregnancy and lactation the amount is much higher. No proof has been offered that large doses of vitamins A, B_1, riboflavin, vitamin C are detrimental to humans. Numerous reports assign to large doses of vitamin D a definitely toxic action on the human subject.—ANON. *Pharm. J.*, 141 (1938), 228. (W. B. B.)

Vitamins. II. Value of Common Foods. A comprehensive list of common foods and their vitamin contents. Bread, cereals, dairy products, fruits, fish liver oils and fish body oils and meats are in the list.—ANON. *Pharm. J.*, 141 (1938), 208. (W. B. B.)

Yeast—Vitamin B Content of, Factors Affecting. Five strains of yeast were grown on three different media, and the yield and vitamin B content of the yeasts were determined. The yield varied both with species and with medium. Calculated on sugar fermented, the weight of dry yeast ranged from 21.4 to 42.5% for grain wort, from 28.0 to 42.7% for molasses salts medium, and from 11.4 to 34.3% for glucose salts medium. The vitamin B content was about the same for most of the yeasts on the same medium but varied considerably with different media. The figures per Gm. of dry yeast were 10 I. U. for grain wort yeast, 3 to 4 I. U. for molasses yeast, and 2.5 to 3.3 I. U. for glucose salts yeast. *"Endomyces vernalis"* showed much less variation in vitamin B content with change of medium. Addition of a vitamin B concentrate, crystalline vitamin B, nucleic acid or liver extract to the glucose-salts medium greatly increased the vitamin B content of baker's yeast. From 50 to 100% of the added vitamin was recovered in the yeast crop. Abstraction of vitamin B from the medium took place also under anærobic conditions and resulted in a yeast containing 20 I. U. per Gm. of dry matter. However, the yield under anærobic conditions was greatly reduced. The absorption of vitamin B from the medium is probably related to the need of this compound in the respiratory processes of the cell. About 70% of the vitamin B content of the grain was found in the wort. Sterilization of the wort for 45 minutes at 15 pounds per square inch pressure destroyed about 20% of the extracted vitamin. However, this was not lost, as the yeast appeared able to reconstitute the vitamin from the decomposition products.—P. L. PAVCEK, W. H. PETERSON and C. A. ELVEHJEM. *Ind. Eng. Chem.*, 30 (1938), 802–805. (E. G. V.)

ANALYTICAL

Abbott Laboratories—Microchemical Laboratory of. Floor plans of the research building and description of the microanalytical laboratory are given. E. F. SHELBERG. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 704–706. (E. G. V.)

Acetic Acid—Microdetermination of. To 5 cc. of acetic acid solution add 1 drop of 0.1% solution of phenol red in neutral 20% alcohol. Heat the solution on a water bath and titrate with 0.01–0.04*N* sodium hydroxide until the color changes from yellow to pink (orienting determination). To another 5 cc. of acetic acid solution add 1 drop of the indicator, and about 90% of the previous amount of sodium hydroxide. Heat the solution and titrate. Allow for the volume of sodium hydroxide solution required to react with the indicator. The results differ by 0.7–2% from those obtained by determination by Pregl's method for the microdetermination of solid organic acids. As little as 0.0254 mg. of acetic acid in 5 cc. can be detected.—I. M. KORENMAN. *Lab. Prakt.* (U. S. S. R.), 6 (1937), 36–37; through *Chem. Abstr.*, 33 (1939), 504. (F. J. S.)

Acetone—Determination of, with Salicylaldehyde. Korenmann's method for the colorimetric determination of small quantities of acetone in alkaline solution by means of salicylaldehyde is unreliable, as the intensity of the color is not proportional to the acetone concentration. This

lack of proportionality is due to the fact that alkali alone also colors salicylaldehyde a greenish yellow. This difficulty can be overcome by acidifying the solution of which the color is to be measured, by means of 60% sulfuric acid, without diluting it with water. Under these conditions, the color due to acetone is reddish yellow.—E. K. NIKITINE and S. A. VERCHINSKI. *J. Prikl. Khim.*, 10 (1937), 755–758; through *Chimie & Industrie*, 39 (1938), 656. (A. P.-C.)

Acrolein and Formaldehyde—Determination of, in the Air. The determination of acrolein consists essentially in adding hydrogen peroxide and hydrochloric acid to its solution in alcohol, mixing, adding phloroglucinol solution and estimating the acrolein content from the pink coloration produced. Under these conditions formaldehyde produces a yellow color, so that in presence of the two there is obtained a yellowish pink. It is possible to determine the two together by the use of mixed standards. Formaldehyde should be first identified by means of Hehner's reagent.—I. L. UZDINA. *Hig. Truda*, 15 (1937), No. 3, 63–66; through *Chimie & Industrie*, 40 (1938), 260. (A. P.-C.)

Air and Gas Protection. VIII. The Detection of Chemical Poisons in Drinking Water at the Source. The apparatus and materials necessary for fitting up a small field laboratory for testing water for poisons are listed. The method of carrying out the tests is described. The reagents for testing for chloride ion and oxidizability are so chosen that unpermissable amounts in water can be detected. Water contaminated by gaseous, mist forming or liquid chemicals can be detected by its odor, especially at 50°, by the increased oxidizability, the high chloride ion content or a change in p_H. Dichloroethyl sulfide or arsines are especially dangerous in drinking water because of the slow hydrolysis they undergo.—J. THOMANN. *Schweiz. Apoth.-Ztg.*, 76 (1938), 429–434. (M. F. W. D.)

Ampul Glass—Chemistry and Pharmacology of. The following points were considered: the physical chemistry of the solute, including tabulation of relation of concentration and conductance and relation of conductance to the area-capacity ratio, methods for testing large containers and pharmacological properties. Experiments used yeast, *Daphnia magna* and goldfish; rats and rabbits; dogs and human subjects. It was found that the Kimble titration method distinguishes between resistance glass and soft glass only. The electroconductivity or the residue methods are necessary to distinguish between treated and untreated soft glass and between soft glass and resistance glass when containers are new but either may be unsatisfactory for used containers. If a standard is set allowance must be made for difference in ratio of area of glass exposed to the volume of water. Sodium silicate predominates in the water-soluble constituents but these constituents have no pharmacological significance in the concentration in which they exist in sterilized parenteral solutions in glass containers. This conclusion is based on single injections and not a series.—R. K. SNYDER. *J. Am. Pharm. Assoc.*, 28 (1939), 7. (Z. M. C.)

Arsenic—Determination of. Copper sulfate, sulfuric acid and thin strips of zinc are added to the solution. Arsine is absorbed by a piece of filter paper saturated with a saturated silver nitrate solution and by silver nitrate solution. The yellow tint of the paper is compared with a standard scale. Since not all arsine is not absorbed by the filter paper and some silver arsenide is changed into arsenious acid and silver, the results are not accurate. A solution containing 0.03 mg. arsenic gave a coloration corresponding to 0.005–0.01 mg. on the scale.—I. M. KORENMAN. *Lab. Prakt.* (U. S. S. R.), 4 (1938), 23–24; through *Chem. Abstr.*, 33 (1939), 496. (E. G. V.)

Arsenic—Determination of Small Quantities of, in Foodstuffs. The method described is essentially the Gutzeit.—K. B. KHAÏT. *Voprosy Pitaniya*, 6 (1937), No. 2, 71–76; through *Chimie & Industrie*, 40 (1938), 143. (A. P.-C.)

Arsenic Determination—Sensitization of Paper Strips with Filtered Mercuric Bromide Solution in the Gutzeit Method of. The filtration technic permits the use of a relatively large quantity of mercuric bromide solution for sensitization without the necessity for discarding it soon after it is first used. The solution can be filtered and used repeatedly for at least 3 or 4 months at a considerable saving of time and materials.—RICHARD S. ROSENFELS. *J. Assoc. Official Agr. Chem.*, 21 (1938), 493–496. (A. P.-C.)

Arsenic—Note on the Determination of. The method of Marsh can give, on the same solution, results varying in the ratio of 1:4. The method of the Brit. Pharm. also is unreliable. Accurate results are obtained by the use of the apparatus and technic developed about 5 years ago

by Martin and Pien (*Bull. Soc. Chim. France*, 47 (1930), 646–654), and available (with directions for use) for Établissements Poulenc, Paris.—CH. BERTIN. *Ann. Fals.*, 31 (1938), 215–218. (A. P.-C.)

Arsenic—Quantiative Determination of. The arsenic content of inorganic compounds was determined volumetrically and gravimetrically by precipitating the arsenic as uranyl ammonium arsenate with a 0.1*N* solution of uranyl acetate. The gravimetric procedure consisted of converting the uranyl ammonium arsenate into uranosic oxide, U_3O_8, and weighing it as such. The method was applied to certain organic compounds of arsenic after they had been converted to arsenic acid by the Carius method or a modification of the Kjeldahl method. Some typical results are given.—DAVID T. LEWIS and VIVIAN E. DAVIS. *J. Chem. Soc.* (London) (1939), 284. (W. T. S.)

Arsenic—Volumetric Determination of, in Food Products. Organic matter is destroyed by wet combustion with sulfuric acid or with sulfuric-nitric acid mixture; arsenic is reduced by means of sulfur dioxide; the solution is neutralized to litmus with solid sodium bicarbonate, and arsenic is titrated with iodine solution in presence of starch indicator. The results are generally slightly low (about 1.2% on the average).—V. S. FEDOROVA and A. N. SOLOV'EVA. *Voprosy Pitaniya*, 6 (1937), 123–126; through *Chimie & Industrie*, 39 (1938), 971. (A. P.-C.)

Ascorbic Acid—Application of the Photoelectric Principle to the Determination of. By the use of an original, previously-described apparatus called the photelgraph, the authors have succeeded in automatically recording, by the photoelectric principle, various processes in which a relative change in trans-illumination of the specimen occurs during the process (coagulation of the blood, Wassermann reaction). This principle has been applied to a study of the well-known specific reduction of a solution of methylene blue under the influence of artificial light in the presence of ascorbic acid. Under standardized conditions this process is quantitative as concerns each of the three main factors participating in this photochemical process. It has been possible to determine quantities less than 0.05 microgram of ascorbic acid per 100 cc. of solution.—K. K. NYGAARD and TH. GUTHE. *Pharm. J.*, 141 (1938), 181. (W. B. B.)

Ascorbic Acid—Estimation of, in Citrus Juices. An Iodine Titration Method. Twenty cc. of the natural-strength juice are transferred to a 250-cc. Erlenmeyer flask and 4 cc. of 12*N* sulfuric acid are added. The added acid lowers the p_H of the sample to about 0.02 to 0.08 by the hydrogen electrode. Freshly standardized 0.01*N* iodine solution is then added until an excess of 1 or 2 cc. is present. Excess iodine may be detected by color change in the sample or by the addition of a drop of starch solution. The test solution is allowed to stand for about 0.5 minute for the reaction to go to completion. Standardized 0.01*N* thiosulfate solution is now added to give an excess of about 1 cc., with 3 cc. of 0.5% starch solution added as the indicator. A trial titration may be run to determine the amounts of iodine and thiosulfate solutions needed to obtain the desired excess values. Finally, more of the 0.01*N* iodine solution is added slowly until the well-known starch-iodine end-point is reached. The total volume of the iodine solution added minus the volume of the thiosulfate solution used (on the iodine equivalent basis) equals the volume of iodine solution consumed by the reducing substances in the sample. One cc. of 0.01*N* iodine solution is equivalent to 0.88 mg. of ascorbic acid.—J. W. STEVENS. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 269–271. (E. G. V.)

Biological Ash—Quantitative Spectrographic Estimation of Trace Elements in. The sample was introduced into the anode by the method of successive additions. The density of the lines formed on the films was measured with a simplified microdensitometer. Analyses for manganese, iron, vanadium, copper, silver and titanium were made of the ash of separate whites and yolks of high and low viscosity eggs, and estimates were made of the relative amounts of silicon, aluminum and phosphorus.—P. H. BELL. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 579–582. (E. G. V.)

Bismuth—Gravimetric Determination of, with the Aid of Picric Acid. Add to the bismuth nitrate solution slightly acidified with nitric acid, an excess of picric acid, neutralize to methyl orange and then add ammonium carbonate. The bismuth is precipitated quantitatively as the basic bismuth picrate, which is washed, dried and ignited to the bismuth oxide. The determination may be carried out in the presence of lead. If small amounts of lead are present a simple washing of the bismuth precipitate is sufficient, but if large amounts of lead are present the precipitate should be washed, dissolved and reprecipitated as above. The precipitation is not in-

fluenced by copper or cadmium. If a mixture of the metals, precipitate with hydrogen sulfide, treat the sulfides with hydrochloric acid to dissolve the bismuth sulfide, change to a nitric acid solution and proceed as above. The method permits determination of bismuth equivalent to 2.0 mg. of bismuth oxide.—H. ETIENNE. *Bull. soc. chim. Belg.*, (May 1938); through *J. pharm. Belg.*, 20 (1938), 686. (S. W. G.)

Boron—Estimation of, by a Modified Flame Test. Air passes at a rate of 150 cc. per minute through a calcium chloride drying tube and a flowmeter into the bottom of a test-tube, where it bubbles through the 7 cc. of liquid containing the boron sample. A mixture of air, alcohol vapor and methyl borate passes out the top of the test-tube, through the nozzle, and through the thin part of a fan-shaped Bunsen flame, igniting and forming a small auxiliary flame at right angles to the other. It is this small flame that is colored distinctly green as long as an appreciable amount of methyl borate is present. The alcohol flame itself is blue-green, but the green imparted to the flame by the boron differs enough so that one has but little difficulty recognizing an end-point. Observation of the flame at intervals of a few seconds is recommended rather than continuous observation. That point when the constant blue-green of the alcohol flame is noted at two successive observations is taken as the end-point. After a few trials this point is readily determined. —H. C. WEBER and R. D. JACOBSON. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 273. (E. G. V.)

Buffers and Buffer Action. A discussion.—A. W. THOMAS. *Am. Perfumer*, 37 (1938), No. 4, 39–40. (G. W. F.)

Calcium Gluconate. The Warsaw Pharmacopœia gives the following specifications for calcium gluconate; (1) On heating 1 Gm. of the preparation with 1 Gm. phenylhydrazine, 1 Gm. of 50% acetic acid and 10 cc. water for forty-five minutes, a phenylhydrazone melting 200° should be obtained. (2) An aqueous solution of calcium gluconate (1:30) gives a yellow color with ferric chloride and a white precipitate with ammonium oxalate in acetic acid. (3) Tests for the sulfate, chloride and heavy metal ions should be negative. (4) An aqueous solution (1:50) of the salt should not reduce Fehling's solution. (5) The $[\alpha]_D^{20°}$ of a 4% solution is +8 to +10°. (6) The loss in weight of a sample heated at 120° should not be more than 1%. (7) The percent of calcium can be determined by precipitation as calcium sulfate.—J. WOJCIECHOWSKI. *Wiadomosci farmac.*, 64 (1937), 473; through *Pharm. Zentralhalle*, 79 (1938), 720. (N. L.)

Calcium—Separation of, as Sulfate by Precipitation in Concentrated Methanol Solution. Evaporate the solution to a volume of 4.5, 9.0 or 19 cc. or evaporate to dryness and dissolve in sufficient water to obtain the desired volume. Then add 0.5 or 1.0 cc. of 9*N* sulfuric acid (1 volume of concentrated acid to 3 volumes of water) and precipitate the calcium sulfate by the slow addition of 45, 90 or 180 cc. of methanol in accordance with the volume of the aqueous solution, so that the final volume is 50, 100 or 200 cc. having a methanol concentration of 90%. Stir constantly during the addition of the methanol. Add 1.0 or 2.0 cc. of 9*N* sulfuric acid to the sample solution and evaporate until the volume is 5.0 cc. Then add 15 cc. of water and precipitate the calcium by the slow addition of 180 cc. of methanol while stirring constantly. After precipitating by either method and allowing the solution to stand until precipitation is complete, filter through a weighed porcelain filter crucible, preferably a Koenig crucible. Wash the precipitate with 90% methanol, first by decantation, then by stirring up the precipitate collected in the filter crucible with a stream of wash liquid and allowing the precipitate to remain in contact with each portion of wash liquid for a few minutes. Depending upon the quantity of calcium and other metals that are present, a total of 30 to 100 cc. will be required for washing. Dry the crucible and its contents for 30 to 45 minutes at 110°, then ignite in an electric muffle for 30 to 45 minutes at 400° to 450°, cool in a dessicator and weigh as anhydrous calcium sulfate. By this method calcium can be accurately separated from a preponderant excess of magnesium and from small amounts of aluminum and iron, but not from other commonly associated elements such as strontium. The method is especially convenient for the rapid determination of calcium in magnesite and in technical grades of magnesium oxide. It is less satisfactory for the determination of high percentages of calcium.—E. R. CALEY and P. J. ELVING. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 264–269. (E. G. V.)

Cannabis—League of Nations Subcommittee on. Supplement to the Fourth Report. The following procedure is given for separating the different constituents of cannabis. *Alcohol.*— Add 100 cc. of petroleum ether to 5 Gm. of the sample and shake frequently during one hour.

Filter, collect 80 cc. of the filtrate and transfer to a separatory funnel. Extract with 50, 30, 30, 20, 20-cc. portions of *N*/10 sodium hydroxide. Wash the petroleum ether solution twice with water, adding the washings to the combined alkaline aqueous solutions, filter through cotton into a tared flask, remove the solvent and place in a desiccator for twelve hours, then weigh. This gives the alcoholic extract from 4 Gm. of sample. *Phenol I.*—Extract the alkaline aqueous solution in a separatory funnel with 100, 75, 75 cc. portions of ether. To the combined ethereal solutions add 5 cc. of *N* sulfuric acid, shake, separate then wash twice with water. Filter into a tared beaker and proceed as for the alcohol. The residue obtained is the amount of phenol I in 4 Gm. of the sample. *Phenol II.*—To the alkaline aqueous solution remaining after extraction with ether add 20 cc. of *N* sulfuric acid, then extract with 100 cc. of ether. Wash the ethereal solution twice with distilled water, filter into a tared beaker and proceed as for the alcohol. The residue obtained is the amount of phenol II in 4 Gm. of the sample. *Phenol III.*—Add 25 cc. of petroleum ether to the phenol residues obtained as above and let stand over night. Decant the solution, wash the undissolved residue twice with petroleum ether, dry in a current of air then place in a desiccator for twelve hours. The residue, which is mainly obtained from the phenol II fraction, is the phenol III obtained from 4 Gm. of the sample. The alcoholic and phenol II fractions are responsible for the biologic activity with the alcoholic fraction which is about 55.5% of the total petroleum ether extract. The alcoholic fraction gives an intense alkaline Beam reaction. This reaction therefore indicates the presence of the principal constituent of the resin of cannabis which is responsible for its addictive properties. The phenol II fraction does not always give a positive alkaline Beam reaction, but it does give the acid reaction. Therefore, the acid Beam test should be carried out whenever a negative reaction is obtained by the alkaline test. Phenol I does not show constant physiologic activity, but it is responsible for the optical activity of the resin of cannabis.—F. De Myttenaere. *J. pharm. Belg.*, 20 (1938), 683–686, 702–707, 723–728. (S. W. G.)

Carbon and Hydrogen—Determination of. A compact, easily built combustion train for the determination of carbon and hydrogen in samples of organic compounds weighing from 50 to 125 mg. is described. The apparatus is mounted on one short ring stand, takes up little desk space, and can be easily moved to a convenient place without dismantling, when not in use. The amount of gas used is measured by the introduction of a new type of gasometer. This makes results more consistent. Heating is done electrically throughout (the boat may also be heated by a flame). Pyrex glass may be used permanently for the combustion tube, when special care is taken and the temperature is kept at about 550°. It is recommended that, when available, harder glass may be substituted and a temperature of 650° be used for more rapid combustion.—S. Natelson and E. B. Conner. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 276–279. (E. G. V.)

Carbon and Hydrogen—Determination of. A compact and movable outfit is described for the determination of carbon and hydrogen on samples ranging from 2.5 to 35 mg. An analytical or microbalance may be used, depending upon the amount of material that is available. Little more time is required for the determination of the semimicrosample than for the microsample. An aspirator is described for conditioning the absorption tubes. Precipitated silver is used in the combustion tube to hold back large amounts of halogen.—S. Natelson, S. S. Brodie and E. B. Conner. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 609–612. (E. G. V.)

Catechu—Knowledge of. A short review of the various components obtained by the extraction of catechu.—R. Wasicky. *Pharm. Zentralhalle*, 79 (1938), 345–346. (N. L.)

***p*-Chlorometaxylenol—Determination of, in Antiseptic Solutions.** Add 2 cc. of a 50% solution of sodium hydroxide to 20 cc. of the solution to be investigated in a 50-cc. distillation flask and distill the alcohol. Transfer the residue to a separatory funnel with 10 cc. of water and remove any essential oil by two extractions with 10 cc. each of petroleum spirit (b. p. 40–60° C.). Wash the petroleum spirit extracts twice with 10 cc. of water. Treat the combined aqueous solutions with 20% calcium chloride solution to precipitate soap. Filter the calcium soaps on a Buchner funnel and wash three times with 10 cc. of hot water. Acidify the filtrate and washings with hydrochloric acid and extract three times with 25 cc. of ether (A). Extract the calcium soaps after washing with hot water three times with 15 cc. of boiling alcohol, combine the alcohol washings and dilute with twice their volume of water, filter and remove the alcohol under diminished pressure. Filter the aqueous solution, acidify with hydrochloric acid and extract three times

with 25 cc. of ether (B). Evaporate A and B together and dissolve the residue in the smallest quantity of 10% sodium hydroxide solution and make up to 60 cc. with water. Pass carbon dioxide through this solution for thirty minutes then extract the suspension three times with 25 cc. of ether. Dry the ethereal solution over sodium sulfate and filter into a tared flask. Distill off the ether and dry the residue in a vacuum desiccator over calcium chloride and paraffin wax and weigh.—R. P. MERRITT and T. F. WEST. *Analyst*, 63 (1938), 257. (G. L. W.)

Cocaine—Detection of, in Mixtures of Cocaine and Nupercaine. A method is given whereby one mg. of cocaine in the presence of 100 mg. of nupercaine can be readily detected. The method is only a qualitative one.—CHARLES MILOS. *Am. J. Pharm.*, 109 (1937), 416. (R. R. F.)

Cyanides—Determination of Small Quantities of, in Fumigated Products. A description of the technic of the colorimetric Prussian blue method.—M. M. REINES and A. I. KRUPKIN. *J. Prikl. Khim.*, 10 (1937), 960–962; through *Chimie & Industrie*, 40 (1938), 360. (A. P.-C.)

2,6-Dichlorophenolindophenol—Standardization of, with Ferrous Compounds. The use of ferrous compounds (particularly ferrous ammonium sulfate) in the presence of metaphosphoric acid or oxalic acid is suggested as a basic standard for 2,6-dichlorophenolindophenol.—A. J. LORENZ and L. J. ARNOLD. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 687. (E. G. V.)

Disinfectants—Analysis of. The merits of the *F. D. A.* method for determining phenol coefficient are briefly discussed, and adoption of the method as official is recommended.—C. M. BREWER. *J. Assoc. Official Agr. Chem.*, 21 (1938), 417–418. (A. P.-C.)

Drugs—Examination of. Calcium Lactophosphate. Arsenic can be detected in this compound by the old method using sodium hypophosphite (Dietzel and Siegert) however, since a dark color arises, it cannot be definitely concluded that arsenic is present and a Gutzeit test must be carried out. *Quinine Dihydrochloride and Carbamate.*—The following method is proposed: Dissolve 0.5 Gm. of the substance in a beaker (75 cc.) in 5 Gm. water, add 5 Gm. sodium hydroxide and 40 Gm. ether, shake vigorously for some minutes. Add 1 Gm. of tragacanth powder, shake again for a short time, allow to stand for 5 minutes and pour off 20 Gm. of the clear solution into a tared flask. After evaporation of the ether on a water bath, dry at 100° C. and weigh. *Soluble Manganese Citrate.*—The N. F. VI monograph is recommended. *Spirit of Ethyl Nitrite.*—A table showing the stabilizing effects (?) of potassium tartrate, sodium tartrate, magnesium carbonate, potassium bicarbonate and sodium sulfite as indicated by titrating the acid formed by *N* potassium hydroxide.—KONRAD SCHULZE and GERDA VOIGT. *Deut. Apoth. Ztg.*, 53 (1938), 1089–1091. (H. M. B.)

Ergometrine—Acidimetric Titration of. The purity of 5 commercial ergometrine preparations was examined. To determine the presence of other secale alkaloids the difference in solubility of the picrates was used. On dissolving 2 mg. ergometrine in 2 cc. water and adding 2 drops of 2*N* hydrochloric acid and five drops of 0.9% picric acid, the solutions should remain clear. The presence of 2% of ergotoxine or ergotamine may be detected by this test. All the preparations gave clear solutions. Electrometric titration of ergometrine with 0.1*N* hydrochloric acid (quinhydrone electrode) showed a definite inflexion of the titration curve at p_H near 4.4. *Colorimetric Titration.*—0.1–0.15 Gm. ergometrine is dissolved by warming in 15–20 cc. water and a little more than the theoretical quantity of 0.1*N* hydrochloric acid. The solution is cooled and bromphenol blue indicator added. It is titrated to blue-green color change with 0.1*N* hydrochloric acid. The results agreed with micro-Kjeldahl assays. *Microtitration.*—5–10 mg. ergometrine are dissolved in somewhat more than the theoretical quantity of 0.02*N* hydrochloric acid and titrated with 0.02*N* hydrochloric acid as in the macrotitration. This must be done by daylight and the solution shaken in the direct light from the window because of the fluorescence of ergometrine. The acid constant and dissociation constant of ergometrine was determined at about 22° C. by measuring the p_H with glass electrode in mixtures of 0.02*N* hydrochloric acid with a solution of 0.01 molar with respect to ergometrine and 0.02*N* with respect to potassium chloride. From Brönsted's formula $p_{Ac} = 6.80$ and $p_B = 7.28$.—F. REIMERS. *Dansk Tids. Farm.*, 12 (1938), 193. (C. S. L.)

Ethylene Glycol—Determination of. A mixture of 50 cc. of *N*/10 potassium permanganate solution, 10 cc. of approximately 0.025*M* glycol solution and 30 cc. of 4*N* sodium hydroxide solution is allowed to stand 1.5 hours after which 50 cc. of 4*N* sulfuric acid are added and the mixture allowed to stand one hour. Add 10 cc. of 10% potassium iodide solution and titrate the liberated

iodine with $N/10$ sodium thiosulfate solution. A blank determination is desirable. Under these conditions glycol reacts with five atoms of oxygen corresponding with complete oxidation to carbon dioxide and water —R. CUTHILL and C. ATKINS. *Analyst*, 63 (1938), 259. (G. L. W.)

Ethylene Oxide and Carbon Dioxide—Gasometric Method and Apparatus for the Analysis of Mixtures of. A gasometric method for the analysis of ethylene oxide mixed with carbon dioxide is reported. Ethylene oxide is swiftly and quantitatively removed from the gas phase by a relatively small amount of sulfuric acid. This reagent absorbs over five thousand times its own volume of ethylene oxide, and the quantity used (only 0.2 cc.) dissolves no significant amount of carbon dioxide. The carbon dioxide is absorbed in a concentrated solution of potassium hydroxide. A reproducibility of $\pm 0.05\%$ is attained; the accuracy is commensurate. All gases are measured dry in a new apparatus designed to perform this type of analysis rapidly.—J. R. BRANHAM and M. SHEPHERD. *J. Research Natl. Bureau Standards*, 22 (1939), 171. (F. J. S.)

Fluorine Spray Residue—Determination of. Suggestions are made to facilitate the control of distillation of fluorine, and for the end-point matching on the titration. Interfering ions are compared. A procedure which gives 102.4% recovery, using a single perchloric acid distillation, is given.—W. F. EBERZ, F. C. LAMB and C. E. LACHELE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 259–262. (E. G. V.)

Ginkgo Tree. A review of the phytochemistry of the plant. Eighteen references are given.—KARL MEYER. *Deut. Apoth. Ztg.*, 53 (1938), 1136–1139. (H. M. B.)

Gold Number in Analytical Practice. The gold number of potato starch is about 25, soluble starch about 10–15, gelatin 0.005–0.01, casein, 0.01, egg albumen 0.08–0.10, acacia 0.15–0.5. A reference is given for the preparation of a suitable gold solution. The author summarizes this paper as follows: (1) Attention is drawn to the possibility of utilizing the gold number in investigations where proteins and carbohydrates require differentiation, or where changes in protein structure are involved. (2) Data are given relating to an examination of canned beans with meat stock. (3) Data are instanced from preliminary investigations into protein denaturation, in which milk and egg white were employed.—J. F. MORSE. *Analyst*, 63 (1938), 156. (G. L. W.)

Hydrogen Peroxide—Process for Vacuum Distillation of. A solution containing active oxygen is passed from a feed tank through ascending tubes into a tubular evaporator, the tubes being heated in such a manner that a continuous movement of the liquid from the feed tank to the tubular evaporation is produced solely by the difference in temperature between the feed tank and the tubes. The whole apparatus is maintained under a substantially uniform vacuum by connecting he feed tank and receiver separately to the same vacuum system.—JEAN MERCIER. U. S. pat. 2,124,257, July 19, 1938. (A. P.-C.)

***p*-Hydroxybenzoic Acid—Colorimetric Test for the Detection of, in the Presence of Salicylic Acid.** *p*-Hydroxybenzoic acid when coupled with an excess of phenyldrazonium chloride yields a mixture of mono-, bis- and tris-azophenols (I) which is insoluble in solutions of alkali carbonates. Salicylic acid yields 4-hydroxy-azobenzene-3-carboxylic acid which is soluble in alkali carbonate solutions. An ethereal solution of I when treated with sodium hydroxide solution develops a deep red color immediately as long as the ethereal solution is in contact with the alkali solution. The method of testing is as follows: A solution of 5 Gm. of aniline in a mixture of 13 cc. of concentrated hydrochloric acid and 26 cc. of water is diazotized at or below 5° C. with a solution of 4.5 Gm. of sodium nitrite in 20 cc. of water. A solution of *p*-hydroxybenzoic acid either alone or mixed with salicylic acid is prepared in a little sodium hydroxide solution and cooled to 5° C. An excess of the diazo solution is added and, after standing for a short time the mixture is acidified and extracted with ether. In the case of mixtures of the two hydroxybenzoic acids, the ethereal solution is shaken with sodium carbonate solution to remove the azobenzene salicylic acid compound, the ethereal layer is separated and shaken with a little sodium hydroxide solution. A deep red color develops in the ether and the alkali solution remains practically colorless. When *p*-hydroxybenzoic acid is present alone, the extraction with sodium carbonate solution is unnecessary. The test is not quantitative.—S. G. STEVENSON and J. C. L. RESUGGAN. *Analyst*, 63 (1938), 152. (G. L. W.)

***p*-Hydroxybenzoic Acid Esters—Titration of.** Esters of *p*-hydroxybenzoic acid are difficult to saponify in aqueous-alcohol solution, but this is more readily done in aqueous solution.

However titration does not give a good end-point and saponification is not a satisfactory means of quantitative analysis of the esters. The free acid formed must be titrated as dibasic acid (p_H about 11), or as monobasic acid (p_H = 6.8). The latter is more accurate but better results are obtained if, after saponification with sodium hydroxide, the *p*-hydroxybenzoic acid formed is titrated bromometrically by Koppeschaar's method. As much of the ester is taken as corresponds to a utilization of 30–40 cc. of 0.1*N* potassium bromate. This is warmed in an iodine number flask on the water bath with 10 cc. sodium hydroxide reagent solution for 15 minutes. After cooling, 50 cc. of 0.1*N* potassium bromate solution is added and, when dissolved, 15 cc. of about 2*N* hydrochloric acid. After standing 15 minutes, 10 cc. of 10% potassium iodide solution are added and the solution is titrated with 0.1*N* sodium thiosulfate solution with vigorous shaking. 1 cc. of 0.1*N* potassium bromate is equivalent to 0.002534 Gm. of methyl ester, 0.002768 Gm. of ethyl ester, 0.003002 Gm. of propyl ester or 0.003802 Gm. of benzyl ester. Results were good with the methyl, ethyl or propyl ester but the benzyl ester yielded low results even with a recrystallized preparation.—P. REIMERS. *Dansk. Tids. Farm.*, 12 (1938), 203. (C. S. L.)

Indicators—Adsorption. Certain indicators have the property of being easily adsorbed by gelatinous precipitates or by colloidally dispersed particles from the liquid and the end of the precipitation is sharply marked by a change in color of the precipitate or the supernatant liquid. The sodium derivative of fluorescein, tropeolin yellow OO, bromphenol blue, metanil yellow, methyl violet and tartrazine have been used in determinations of bromides and chlorides. Safranin colors the silver chloride precipitate red until the point of equivalence, when the color of the precipitate changes sharply to blue. Diiodo-dimethyl-fluorescein is used in the determination of iodide in the presence of chloride, the precipitate becoming red at the end-point. Eosin permits the titration of chloride in acid solutions; while rhodamine 6G permits the inverse titration of silver in acid solution. Diphenylamine blue may be used in the silver nitrate titration of chloride in sulfuric acid medium. Diphenylcarbazide may be used in the titration of cyanide by silver nitrate; while cyanate may be determined in the presence of cyanide by using fluorescein as indicator. Sodium alizarin-sulfonate, alizarin red or eosin may be used as internal indicators in the titration of lead with sodium molybdate. Lead (nitrate or acetate) may be titrated by adding to a known volume of standard neutral sodium oxalate solution, using dichloro- or dibromo-fluorescein. The same reaction may be used for determination of nitric or acetic acid. Sulfuric acid or soluble sulfates may be titrated with lead solution using eosin as indicator. Zinc in sulfuric acid solutions may be titrated with ferrocyanide solution in the presence of diphenylamine or diphenylbenzidine. Sulfuric acid may be titrated with barium chloride in the presence of tetrahydroxyquinone which turns from yellow to brown then to red at the saturation point. Barium may be titrated by a standard potassium chromate solution in the presence of rosolic acid. The color variations of these indicators is due to molecular rearrangements.—A. JOUNIAUX. *Ann. chim. anal. chim. appl.* (Jan. 1938); through *J. pharm. Belg.*, 20 (1938), 746. (S. W. G.)

Lactic Acid—Modification of the Permanganate-Iodometric Method for the Determination of. When the quantity of lactic acid is very small, the method of Friedmann and Kendall gives too large an error. A modification of the method is described in which 5 mg. of lactic acid can be determined within 1% of the truth. This consists (1) in circulating water at about 21° around the condenser; (2) using an oxidizing flask equipped with a tube reaching to the bottom, through which the potassium permanganate solution is added, and air is aspirated during the reaction. The air that carries the acetaldehyde is then broken into fine bubbles by passing through the fritted glass plate of the Jena 1-G-3 funnel used to hold the sodium bisulfite solution. The funnel is covered with a rubber stopper through which passes a tube connected to the pump for aspirating the air. In this way, acetaldehyde enters the solution of sodium bisulfite very finely broken up and reacts completely. The average error is about 1%, though on quantities around 0.10 mg. it is as much as 30%. Zinc lactate gives more reliable results than sodium lactate.—P. E. GALVAO C. H. FLORENCE and J. PEREIRA. *Arquivos inst. biol.* (Sao Pãulo), 9 (1938), 48–50; through *Chem. Abstr.*, 33 (1939), 90. (F. J. S.)

Lead Sulfate—Solubility of, in Solutions of Sulfuric Acid, Determined by Dithizone with a Photronic Cell. New determinations of the solubility of lead sulfate in sulfuric acid solutions have been made, using diphenylthiocarbazone, commonly called dithizone, as the reagent. This provides a very sensitive method for small quantities of lead. The equivalence point was de-

tected by a simple arrangement of a photronic cell and color filter. The range of concentrations of acid extended from 0.1 to 50% sulfuric acid. Determinations of the lead could be made with an average error not exceeding 0.7 microgram. Determinations were made at 25° and 0° C., employing solutions, some of which were brought to saturation equilibrium from undersaturation and others from supersaturation. Important maxima and minima in the solubility curves which had not been reported previously were found. Tables are given for the solubility of the salt at 25° and 0° C. Comparison is made of the effect of sulfuric acid on the solubility of lead and mercurous sulfates. The trend of the curves for these is strikingly similar, although the latter is more than eighty times as soluble.—D. N. CRAIG and G. W. VINAL. *J. Research Natl. Bur. Standards*, 22 (1939), 55. (F. J. S.)

Marihuana—Field Tests for. The test, particularly adapted to the determination of this drug in cigarettes is simple, quick, reliable, distinctive, delicate and fairly permanent. A portion of a suspected cigarette (without the wrapper), or as little as one-tenth of a Gm. of the suspected weed, dried and somewhat comminuted, is placed in a small, wide-mouthed container. To it is added, followed by immediate shaking for five seconds, a small but excessive amount in volume of a test solution, consisting of benzene (nine parts) and sodium hydroxide (2%) dissolved in ethyl alcohol (one part). The liquid is then immediately decanted into an evaporating dish. A positive test, recognized by the appearance of a color change from slightly yellowish to pinkish within one to two minutes, becoming deeper red after standing a short time, indicated the presence of cannabinol. For its further characterization, spontaneous evaporation of the reddish liquid leaves a dry, partially pinkish to violet, rather persistent, residue. This dissolves to an orange-red solution in strong ammonia and with a violet to almost bluish violet color in acetone.—ARNO VIEHOEVER. *Am. J. Pharm.*, 109 (1937), 589. (R. R. F.)

Mercury—Determination of, in Organic Compounds. After the destruction of the organic matter with hydrochloric acid and potassium chlorate, it is recommended to electrolyze the diluted hydrochloric acid solution with an electrode of gold attached to a platinum wire. No data are given to show that the anode of platinum is not attacked by the chlorine gas but it is stated that if a cathode entirely of gold is used, it is attacked.—R. JACQUEMAIN and G. DEVILLERS. *Bull. soc. chim.*, 5 (1938), 1338–1340; through *Chem. Abstr.*, 33 (1939), 504. (F. J. S.)

Mercury—Ethanolamine in the Determination of, in Inorganic and Organic Compounds and Pharmaceutical Preparations. The method for the determination of mercury in salts, oxides and mercurochrome follows: Slip the weighing bottle containing the sample into the digestion tube, add 3 to 5 cc. of monoethanolamine, and attach the cold finger. Suspend the digestion tube loosely from a clamp and gently boil the amine with a microburner for at least five minutes. In some cases colloidal mercury begins to appear as soon as the amine strikes the salt. At the boiling temperature the colloidal mercury quickly disappears and the reduction is probably complete in a very short time, but at least five minutes boiling should be allowed. The mercury appears as a single globule at the bottom of the test-tube or at the narrow part of the pear. Cool the tube and contents rapidly to below 100°, by lowering the tube into a beaker of cold water, and wash down the condenser with water. After removing the condenser add more water to bring the total volume 15 or 20 cc. to reduce the viscosity of the amine. In some cases, but not usually, an insoluble material may appear on dilution. When only mercury is to be determined, remove the liquid from the tube by means of the filtration arrangement designed by Pregl for the determination of halogens, but employ a blank tube without any filtering medium. This reduces the filtration time to a matter of seconds. Correct placing of the lower end of the siphon tube facilitates removing the liquid without disturbing the mercury. Wash the globule several times with small amounts of water and suck this over as above. In each case all but a fraction of a cc. of the wash liquid may be easily removed. Finally bring the globule over to the prepared micro halogen filter tube by lowering the siphon over the globule and gently applying suction. If the globule breaks into several smaller globules as it falls on the mat of the filter tube, assemble these by gently tapping the tube so that the particles roll around and come into contact with each other. Wash the globule several times with water and finally several times with dry acetone. Remove the filtering tube from the suction flask and thoroughly wipe it with moist flannel. Then place it in the filtering arrangement with a perfectly dry suction flask, attach a cotton filter tube and aspire a gentle current of air through the tube for 5 minutes. Finally place the tube near the balance and weigh it after 10 minutes. For microwork, 10 minute aspirations and 15 minute

standings are advisable. The filter tubes are of the type used for handling the silver halides, and have coarse sintered-glass disks and thick asbestos mats. The mats should be firmly pressed with the blunt end of a glass rod to make the upper surface as hard as possible. The tubes are prepared for use by washing with water and dry acetone and drying as indicated above. The mercury may be determined volumetrically. For organic compounds other than salts the sample is refluxed with 3 to 5 cc. of monoethanolamine and 2 to 3 cc. of dioxane. For microwork add about 0.2 Gm. of sodium in small pieces from time to time, and for larger samples use correspondingly larger amounts of sodium. The mercury set free by the reduction emalgamates with unreacted sodium and appears at the end of a half-hour, refluxing as a small hard pellet at the bottom of the tube. After the heating period, remove the liquid contents of the tube as usual and thoroughly wash the pellet with water in the tube. Cover it with about 5 cc. of water and boil the water until the amalgam no longer evolves hydrogen, showing that all the sodium has been destroyed. This usually takes about 5 minutes. From this point on the procedure is the same as above.—W. H. RAUSCHER. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 331–333. (E. G. V.)

Microanalysis. Inorganic micromethods of quantitative analysis are now sufficiently developed to warrant their adoption in both research and technical problems. The filter-stick technic has been successfully used already in problems of plant nutrition in growth experiments with barley. Another application of micromethods actively in progress is in the analysis of dust, especially in connection with work on silicosis and allied diseases caused by the inhalation of dangerous dusts.—J. MATTHEWS. *Pharm. J.*, 141 (1938), 181. (W. B. B.)

Naphthalene—Determination of, in Poultry Lice Products. A study was made of the application of available methods to pure naphthalene: sublimation with Hortvet sublimator at reduced pressure, picric acid precipitation and bromination. In no case were satisfactory results obtained, and the methods are being studied further.—R. JENKINS. *J. Assoc. Official Agr. Chem.*, 21 (1938), 416–417. (A. P.-C.)

Naphthalenesulfonic Acids—Microscopic Identification of Some Important Substituted. A rapid and relatively simple method has been developed for the microscopic identification of a number of important naphthylamine, naphthol and aminonaphthol sulfonic acids by means of their benzoyl derivatives. The procedure has been standardized so as to be applicable to the entire group of acids; only small amounts of material are required. The benzoyl derivatives offer a possible method of separation of some of the acids. The characteristics and microscopic appearance of 15 of these sulfonic acids and their derivatives have been tabulated, including optical data for the latter, and photomicrographs of characteristics have been prepared.—W. F. WHITMORE and A. I. GEBHART. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 654–661. (E. G. V.)

Nicotine—Determination of, in Forensic Material. Mix finely chopped liver with citrate buffer and papayotin, the proteolytic enzyme from papaya, activated previously with hydrocyanic acid. Preserve with toluene and incubate for 48 hours at 40° with frequent shaking. Heat for 1 hour on a water bath, filter off clear liquid and wash the residue with acidulated water. Evaporate to small volume, extract once with ether (acidified), then 3 times with ether in a strongly alkaline medium. Treat the latter extracts with ether solution of picric acid, then filter off the precipitated nicotine dipicrate and weigh. The purity of the material can be tested by melting point as well as by mixed melting point, with the dipicrate precipitated from the pure nicotine.—F. HALSTROM. *Acta Med. Scand., Suppl.* 90 (1938), 420–435; through *Chem. Abstr.*, 33 (1939), 89. (F. J. S.)

Nicotinic Acid Amide—Colorimetric Determination of. Various accurately weighed quantities of nicotinic acid amide (1–25 mg.) were fused for 1 hour with exactly 4 times the quantity of 2,4-dinitro-1-chlorbenzene. Then the cooled melt was treated with ether to dissolve the unchanged dinitrochlorbenzene, the ether extract rinsed into a separatory funnel and the fusion vessel washed out several times with water and ether. All the extracts were quantitatively rinsed into the separatory funnel, 10 cc. more water added, and the mixture thoroughly shaken. The aqueous layer was drawn off and the ether layer extracted twice with water. The combined aqueous extracts were placed in a volumetric flask and the dissolved ether removed by careful warming. After cooling, the flask was filled with water and the clear solution placed in a colorimeter cup and 1–2 drops of 20% potassium hydroxide added. The immediately appearing yellowish red color was promptly examined because it fades in time. A standard curve was plotted from the extinction modulus. The solutions were also examined in a tintometer and standard curves

plotted in terms of red and yellow units. 6 mg. of an impure cozymase preparation was examined by this method and found to contain 7.5% of nicotinic acid amide. The extract from 500 Gm. of fresh beef liver was examined and found to contain 2.26 mg. of nicotinic acid amide.—P. KARRER and H. KELLER. *Helv. Chim. Acta*, 21 (1938), 463. (G. W. H.)

p_H—Determination of, with Monochromatic Indicators by Means of the Pulfrich Photometer. A study of the application of α-, β- and γ-dinitrophenol to the determination of p_H by means of the Pulfrich photometer. A series of colored solutions was prepared with these indicators and the p_H's were determined electrometrically. The β-indicator is particularly suitable for the p_H range 1.30 to 3.70, the α for 2.50 to 4.33 and the γ for 3.62 to 5.74. The method of carrying out the determination is described.—E. LUCCHI. *Giorn. biol. ind.*, 7 (1937), 154–163; through *Chimie & Industrie*, 40 (1938), 235–236. (A. P.-C.)

Phosphoric Acids—Determination of Ortho-, Pyro- and Meta-, by Colorimetric p_H Titrations. Titrating HPO_4, $H_4P_2O_7$ and H_3PO_4 with sodium hydroxide to p_H 4.4 (using Bromocresol green) gives $NaPO_3$, $Na_2H_2P_2O_7$ and NaH_2PO_4. Then by titrating to p_H 8 (using thymol blue), with the addition of sodium nitrate to prevent too much hydrolysis, the latter two are converted to $Na_4P_2O_7$ and Na_2HPO_4. If now an excess of silver nitrate is added to precipitate the insoluble silver salts, the last hydrogen can be titrated to a methyl orange end-point, with sodium hydroxide. A nomograph curve is shown for varying compositions, giving the exact end-point values for the composition of the acid tested. Weak acids or weak bases cannot be present.—A. B. GERBER and F. T. MILES. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 519–524. (E. G. V.)

Pyrethrins, Derris and Cubé—Determination of. The Wilcoxson mercury reduction method for the determination of Pyrethrin I, as modified by Holaday (*Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 5) is satisfactory when applied to pyrethrum powder, to pyrethrum powder mixtures and to mineral oil-pyrethrum extracts. Pine oil, oleic acid and derris resins do not interfere. The method seems to be specific for Pyrethrin I and is not affected by the usual ingredients of pyrethrum spray materials.—J. J. T. GRAHAM. *J. Assoc. Official Agr. Chem.*, 21 (1938), 413–415. (A. P.-C.)

Quinine Hydrochloride Pills—Complete Chemical Examination of. Weigh a definite number of the pills. Remove the superficial layer of paraffin or wax with petroleum ether, then dry and powder. Place about 5 Gm. of the powder, accurately weighed, in a porous glass crucible which has been dried at 110° and weighed. Cover with a wad of defatted and dried cotton and weigh again. Dry in an oven at 110° to constant weight to obtain moisture. Place in a continuous extraction apparatus (Carlswerk extractor is recommended) and extract the fatty matter with petroleum ether over a sand bath. Dry the crucible and residue to constant weight to determine the amount of fat extracted. Replace in the extractor and extract the anhydrous quinine hydrochloride with chloroform. The sugar in the residue may be extracted with 95% ethyl alcohol although several hours may be required for its solution. The residue will generally be mainly starch and talc and may contain traces of acacia, lycopodium, etc. Ignite a weighed portion of the dried residue and from the weight lost the amount of talc may be determined. The substances separated above, after obtaining their weights directly, or indirectly, may be determined quantitatively by assay procedures as checks on their purity.—G. N. THOMIS. *J. pharm. chim.*, 28 (1938), 111–114. (S. W. G.)

Rhus Glabra. An extensive examination of the fruits of this plant was made, including moisture determination, selective solvent extraction by the Dragendorff method, an ether extraction determination, arsenic, ash and its constituents, determination of the constituents of the fixed oil, etc.—G. H. MCFADDEN and R. L. MCMURRAY. *Am. J. Pharm.*, 109 (1937), 397. (R. R. F.)

Sodium and Orthophosphate Ions—Spectrophotometric Determination of. *Phosphate Ion.*—Make acid to methyl red with diluted acetic acid, then add, for each 10 cc. of the solution, 2 cc. of a 1:10 dilution of a solution containing glacial acetic acid 50 Gm., crystalline sodium acetate 100 Gm., and distilled water enough to make 1000 cc. To 2 cc. of the prepared sample in a centrifuge tube add 10 cc. of a solution containing 40 Gm. of uranyl acetate per liter. The sample used should not contain more than one-half mg. of phosphoric anhydride. Heat on a boiling water bath for five minutes then centrifuge. Wash the precipitate twice with diluted sodium acetate reagent (1:100) by mixing, heating on the water bath and then centrifuging. To the drained residue add 0.5 cc. of hydrochloric acid (1:10) and rotate the tube to dissolve any particles ad-

hering to the walls. Transfer the liquid to a graduated 10-cc. flask, washing with a mixture of glycerin and water (1:1). Mix, add 0.5 cc. of 20% solution of potassium ferrocyanide, mix and let stand for twenty minutes. Observe in a spectrophotometer after inverting several times to mix the color uniformly. A Pulfrich spectrophotometer is used together with Wratten screens Nos. 53 and 57; and the thickness of the observed column is 10 mm. Screen 53 (yellow) extinguishes the color produced by 0.150 mg. of phosphorus pentoxide in 10 cc. of the sample when the reading is 1.00; while screen 57 (yellow-green) extinguishes the color produced by 0.257 mg. of phosphorus pentoxide in 10 cc. of sample. *Sodium Ion.*—If phosphate is present, remove by precipitation with uranyl acetate in very slightly acid solution. The alcoholic reagent of Blanchetiere (modified by Kahane) (crystalline uranyl acetate 32 Gm., magnesium acetate 100 Gm., acetic acid 20 cc., alcohol (90%) 500 cc., distilled water to make 1000 cc.) is recommended. Mix the sample and reagent in a centrifuge tube, let stand for fifteen minutes, centrifuge, wash three times with 95% alcohol, then continue as above for phosphate ion. When observed through a column 10 mm. thick and the readings are 1.00, screen 53 is equivalent to 0.0534 mg., and screen 57 is equivalent to 0.091 mg. of sodium in 10 cc.—A. LECLERE. *J. pharm. chim.*, 28 (1938), 152–158. (S. W. G.)

Sodium Thiosulfate Solution—Decinormal, Standardization of, with Potassium Dichromate. A modification of the method proposed in the 6th revision of the German Pharmacopœia. Place 10 cc. of 10% potassium iodide solution in a 500-cc. Erlenmeyer flask, dilute with water to 100 cc., acidify with 20 cc. of 25% hydrochloric acid, from a burette add 20 cc. of decinormal potassium dichromate with constant stirring, and immediately titrate the liberated iodine with the thiosulfate solution to be standardized, adding a little starch indicator toward the end of the titration.—E. TSCHIRCH. *Pharm. Ztg.*, 82 (1937), 450–451; through *Chimie & Industrie*, 39 (1938), 653. (A. P.-C.)

Spongia Fluviatilis. The ash of this fresh-water sponge, occurring in Russia and eastern Poland, has been examined and found to contain: *Meyenia Müller*i (ash 77.4%).—Silica 90.9, phosphates (P_2O_5) 0.89, ferric oxide present, manganese 1.55, alumina 0.98, lime 0.41, magnesium 0.18, potassium 0.06, sodium 0.07%; *Euspongilla Lacustris* (ash 36.1 to 47.5%).—Silica 92.1 to 93.7, phosphates 2.2 to 4.2, ferric oxide 0.5 to 2.5, manganese 0.3 to 0.8, alumina 0.6 to 1.5, lime 0.1 to 2.7, magnesium 0.1 to 0.3, potassium 0.2 to 0.5 and sodium 0.1 to 0.2%.—P. OFICJALSKI. *Farm. Wspolczesna*, 5 (1936), 108–116, 155–194, 262–282; through *Chimie & Industrie*, 39 (1938), 720. (A. P.-C.)

Spot Analysis—Inorganic and Organic. Spot tests are described for the detection of manganese, phosphoric acid, reducing substances, hydrogen peroxide, reducing sugars, paladium, silver, ammonia, sulfides and other sulfur compounds, bismuth and acetates.—F. FEIGL. *Chemistry and Industry*, 57 (1938), 1161–1165. (E. G. V.)

Sulfamic Acid as a Standard of Reference in Acidimetry. Sulfamic acid, NH_2SO_3H, is a crystalline, non-hygroscopic solid, available on the market in any desired quantity at a moderate price. It is a strong acid in aqueous solution and can be titrated with bases, using indicators with transition ranges varying from a p_H of 4 to 9. Sulfamic acid is an excellent acidimetric standard of reference and should find widespread use in analytical chemistry. In precision and accuracy it compares well with other acidimetric reference materials. It can be purified and dehydrated easily and thus be obtained in uniform and exact composition.—M. J. BUTLER, G. F. SMITH and L. J. AUDRIETH. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 690–692. (E. G. V.)

Sulfur Ointments—Official, and Their Assay. The sample, containing approximately 0.03 Gm. of sulfur, is covered with 0.2 Gm. of potassium cyanide, water and acetone are added, and the mixture is evaporated to dryness at temperature greater than the melting point of the ointment. Evaporation is repeated twice after additions of acetone. The residue is repeatedly extracted with hot water, the combined extracts being boiled with boric acid and, when cool, treated with phosphoric acid and enough aqueous bromine to produce a yellow color. The solution is decolorized with phenol solution, and, after 15 minutes, excess of potassium iodide is added. The mixture is kept for 30 minutes in darkness and titrated with sodium bisulfite.—H. M. BURLAGE and C. E. BRADY. *J. Elisha Mitchell Sci. Soc.*, 51 (1935), 241–242; through *J. Soc. Chem. Ind.*, 57 (1938), 1228. (E. G. V.)

Theobromine—Extracting, from Cacao-Containing Material. Material such as cacao press-cake is treated with water heated to about 60° to 100° C. to effect wetting and dispersion,

and, without further heating, there is added to the mass a mixture of water and an alkaline-earth oxide such as lime, and the solids are separated from the liquid (the total quantity of water added being sufficient to dissolve substantially all the theobromine present).—BENJAMIN J. ZENLEA, assignor to ROCKWOOD & Co. U. S. pat. 2,118,129, May 24, 1938. (A. P.-C.)

Vinegar—Analysis of. I. Spirit, Malt Distilled Malt and Artificial Vinegars and Their Differentiation. Determinations of total solids, ash, phosphates and nitrogen are valueless in certain instances, but in these the oxidation, iodine and ester values are shown to be definitely useful. In determining these three values the masking effect of the presence of caramel is overcome by distilling the sample and using the distillate for all determinations; decolorization by active carbon was found to be unsatisfactory. Oxidation value is defined as the number of cc. of $N/100$ potassium permanganate used by 100 cc. of vinegar in 30 minutes under the standard conditions described. Iodine value is defined as the number of cc. of $N/100$ iodine absorbed by 100 cc. of vinegar under the standard conditions described. Ester value is defined as the number of cc. of $N/100$ potassium hydroxide required to saponify the esters contained in 100 cc. of vinegar under the standard conditions described. It is demonstrated how the data derived by these new methods can be utilized in the distinction of spirit vinegar from artificial vinegar and of distilled malt vinegar from diluted acetic acid.—F. W. EDWARDS and H. R. MANJI. *Analyst*, 63 (1938) 410. (G. L. W.)

Volumetric Solutions—Standard, Preparation of. A collaborative study of the present tentative *A. O. A. C.* methods for the preparation and standardization of decinormal sodium hydroxide and hydrochloric acid solutions showed that they were quite satisfactory.—R. L. VANDAVEER. *J. Assoc. Official Agr. Chem.*, 21 (1938), 410–412. (A. P.-C.)

Wash Bottles—Permanent Covering for the Necks of Hot Water. A cheap, permanent, impervious and non-slip grip can be made by applying a pulp of filter paper and water to form a layer about $^3/_{16}$ in. thick round the neck of the wash-bottle, allowing it to dry, and applying several coats of cellulose varnish. It is essential that the pulp should be dry before the varnish is applied and that the varnish should soak well into the pulp. The slightly rough surface of the pulp affords a good non-slip grip for the hand and the varnish is unaffected by hot water.—ANON. *Chemistry and Industry*, 58 (1939), 50. (E. G. V.)

Water—Determination of, in Vegetable Oils. The following procedure has been developed for the determination of water in vegetable oils; 10–15 Gm. of oil and 12 Gm. of glycerin (88–90%) are shaken and agitated for five minutes. This is then repeated and the water-content of the glycerin is determined by use of the refractometer using the equation, $0.03 + 769\ p\text{-}(n_o\text{-}n)/m$, where n_o and n represent the refractive indexes before and after shaking; p and m are the number of Gm. of glycerin and water used, respectively. If the oil is anhydrous, it will absorb water from the glycerin until the former contains 0.03% water.—P. Z. ZAITSCHENKO, V. P. RSHECHIN and N. I. POZONKINA. *J. Appl. Chem. Russ.*, 10 (1937), 908–916, through *Seifensieder-Ztg.*, 65 (1938), 19. (N. L.)

Water Analysis—Contribution to. I. Specific Conductivity as a Measure of Total Dissolved Solids. The direct estimation of total dissolved solids by evaporation and drying at temperatures varying from 100° to 180° is not reliable since some salts found in waters may still retain water of crystallization at the latter temperature. Experiments were conducted to determine the applicability of conductivity measurements to this problem. It was found that (*a*) dissolved carbon dioxide has a negligible effect on the determination of dissolved solids in natural waters, (*b*) three empirical "type" curves could be drawn representing respectively, sulfate or nitrate waters, bicarbonate or mixed saline waters and chloride or carbonate waters and (*c*) the specific conductivity was increased or decreased by 2.4% of the value at 18° C. for each 1° C. above or below this standard temperature, respectively. The correction factor may be applied between 10° and 30° C. A measurement of the specific conductivity will give the saline content of the water with considerable accuracy if the approximate proportions of bicarbonate, carbonate, chloride, sulfate and nitrate are known. **II. Determination of Hardness.** A critical study of three methods of determining hardness was made. Some refinements in the palmitate titration method were suggested which were intended to increase its accuracy for soft waters. **III. Comparison of Distillation and Direct Methods of Estimating Free and Albuminoid Ammonia in Waters.** Whenever the physical condition of the water itself makes it

possible, the direct method may be employed in place of the standard method. A Hellige comparator is recommended.—W. H. KITTO. *Analyst*, 63 (1938), 162. (G. L. W.)

Water of Analytical Quality—All-Glass Still for the Continuous Production of Distilled. The still, made of Pyrex glass, is so constructed that the water is collected at a temperature very close to its boiling point so that the gases volatilized from the water will not tend to redissolve.—I. C. P. SMITH. *Chemistry and Industry*, 57 (1938), 963–965. (E. G. V.)

Zinc—Colorimetric Micromethod for the Determination of. The method is applicable for determination of quantities of zinc ranging from 0.05 to 1.0 mg. After a preliminary separation of the zinc from interfering elements, 5-nitroquinaldic acid is used as a precipitating agent. The precipitant is filtered from the excess reagent, and converted into an orange-colored, water-soluble compound by reduction with stannous chloride. The intensity of color is measured by means of a photoelectric colorimeter. Precipitation of zinc by 5-nitroquinaldic acid is complete within a range of p_H 2.5 to p_H 8.0 after digestion for 30 minutes. Ammonium chloride and sodium chloride in concentrations greater than 0.7*N* inhibit the complete precipitation of the zinc. The intensity of the color of the reduction product of 5-nitroquinaldic acid is independent of the acid concentration at acidities lower than 0.8*N* and of the concentration of stannous chloride. The intensity of color increases appreciably with rise in temperature of the solutions, making it necessary to carry out all the readings at the same temperature.—W. L. LOTT. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 335–338. (E. G. V.)

Zinc—Electrolytic Determination of, in Foodstuffs. The method is based on double electrolysis of the zinc in aqueous medium, using copper plated platinum electrodes, at a temperature not exceeding 80° C. Organic matter is destroyed by wet combustion with sulfuric-nitric acid mixture. After electrolysis all of the nitric acid and part of the sulfuric acid are eliminated. After the first electrolysis the zinc is dissolved in 3% sulfuric acid; the solution is rendered alkaline and electrolyzed a second time. Copper or brass electrodes can be used instead of platinum. Presence of small quantities of iron and copper do not interfere with the electrolysis. The accuracy of the method is of the order of 0.4 mg.—N. D. PODOBED and F. A. CHIGIRINSKAYA. *Voprosy Pitaniya*, 6 (1937), No. 2, 59–66; through *Chimie & Industry*, 40 (1938), 142. (A. P.-C.)

PHARMACOGNOSY

VEGETABLE DRUGS

Arbutus Plants. I. Comparative Pharmacochemical Investigations on Arctostaphylos Uva Ursi and Bergenia Species. The arbutin and tannin contents of a number of Bergenia and Arctostaphylos plants are reported with the result that the leaves of certain Bergenia can well replace the leaves of *Arctostaphylos uva ursi*. The following modification of Grimm's method for the determination of arbutin is offered: Boil under a reflux with 3 x 5 cc. portions of ether; after each boiling, the sample is centrifuged and the separated ether is poured off. Evaporate the residual ether with gentle warming and, in a similar manner, boil the dry material with 3 x 10 cc. portions of water, pour off the clear extracts obtained by centrifuging and heat the combined extractions with 2 cc. of a solution of lead subacetate. Separate the precipitate by centrifuging, wash with 5 cc. water. The liquids are united in a third tube, add 3 cc. sulfuric acid, centrifuge again and wash. The clear liquids are united and transferred to a 100-cc. Ehrlenmeyer flask and heated gently on a sand-bath under a reflux condenser for an hour. The liquid is titrated with 0.1*N* iodine, as by the Grimm method. The $\%$ arbutin $= \dfrac{\text{cc. } 0.1N \text{ iodine} \times 0.014055 \times 100}{\text{weight of sample}}$.

Changes in content by drying are also reported. Sixteen references are given.—O. MORITZ. *Deut. Apoth. Ztg.*, 53 (1938), 653–657. (H. M. B.)

Chemical Division—Report of. Camphor oil prepared from leaves and twigs of *Cinnamomum camphora* grown in Mauritius showed $d_{15.6}^{15.5}$ 0.9189, $[\alpha]_D^{16}$ 33.22 and n_D^{20} 1.4754. The oil contained 0.5% cineole but little or no safrole. The alkaloids extracted from *Erythroxylacene hypercifolium* and *Erythroxylacene laurifolium*, which grow wild in Mauritius, contained no cocaine.—R. LINCOLN. *Dept. Agr., Mauritius, Ann. Ret.* (1935), 33–37 (Pub. 1936); through *Chem. Abstr.*, 33 (1939), 2283. (F. J. S.)

Chicle into Chewing Gum. Chicle, the concrete juice of the sapodilla tree, *Achras sapota*, forms the basis from which chewing gum is made by the addition of flavoring agents and sugar. The latex is obtained from the tree in much the same way as rubber. V-shaped cuts are made in the bark with a cutlas or machete. The cuts are extended up the trunk for 20 to 30 feet, the trappers climbing and supporting themselves by means of "climbing bands" of rope. The latex trickles down the cuts and is collected in a receptacle fixed at the base of the tree. Coagulation is hastened by the application of heat, and to this end the collected latex is heated in an open cauldron supported over a fire upon a primitive tripod. During the boiling the material is stirred with a pole to expose it continually to the air over as large a surface as possible, until a sample taken from the pot is found to set on cooling. When this is reached, and the latex has become cool enough to handle, the product is poured on to a canvas sheet and kneaded into blocks weighing from 5 to 20 pounds apiece. The blocks are left over night and then packed for export in bales weighing about 100 pounds each. On arrival in this country the chicle is ground, filtered, refined and sterilized. In this finished condition it becomes the true raw material for chewing sweets, and only requires the addition of flavoring agents and sugar, rolling out, cutting and packing to produce the finished sweetmeat.—ANON. *Chemist and Druggist*, 129 (1938), 218. (A. C. DeD.)

Color Evaluation—Method for. Null or zero deflection is used in electrical measurement circuits for comparing values of resistance voltage and others. This paper tells how to construct and use a two-cell color evaluator, and draws the following conclusions: With suitable selection and sufficient care in manipulation, null method equipment may be used for color evaluation of drugs and other samples with favorable accuracy; without suitable equipment and careful operation, the error may be much greater than by visual comparison.—PAUL F. SHUEY and L. K DARBAKER. *J. Am. Pharm. Assoc.*, 27 (1938), 1216. (Z. M. C.)

Datura Stramonium Linné—Chemicopharmaceutical Study of. Both the seed and leaf of *Datura stramonium* have been official but in recent years the seed has been dropped despite the fact that it represents a higher percentage of the dried plant and is richer in alkaloid than the leaf. Its action is similar to belladonna which has largely replaced it. A historical review of its origins and uses is given.—R. W. CLARK. *Pharm. Arch.*, 9 (1938), 89–96; through *Chem. Abstr.*, 33 (1939), 1880. (F. J. S.)

Digitalis Thapsi L.—Value of, as Substitute for Digitalis Purpurea L. A morphologic description of the sample of *D. Thapsi* from Spain is given. The authors' experiments led to the following conclusions: The pharmacologic activity of *D. Thapsi* was found to be equal to if not superior to that of *D. Purpurea*. The activity is attributed to the presence of a chloroform-soluble glucoside which resembles crystallized digitalin in its pharmacodynamic and toxic properties. The infusion of the drug has a very intense diuretic action on the chloralosed dog when administered intravenously. No arterial hypertension in noted in the animal under the influence of the infusion. *D. Thapsi* seems to be a substitute for *D. Purpurea* rather than an adulterant of the latter. According to the assay procedure in the French Codex the sample of *D. Thapsi* studied would be reported as a very good digitalis. *D. Thapsi* is frequently used in Spain in place of *D. purpurea*.—A. JUILLET, F. MERCIER and L. VIGNOLI. *J. pharm. chim.*, 28 (1938), 465–77. (S. W. G.)

Medicinal Plants of Colonial Italian Africa. A list of plants and their principal medicinal uses are given.—C. MASINO. *Boll. chim.-farm.*, 77 (1938), 278–282; through *Chem. Abstr.*, 33 (1939), 3066. (F. J. S.)

Nicotiana Rustica—Post-Harvesting Treatment of, for the Production of Citric Acid. With the prolongation of the after-ripening period the quantity of citric acid increases and of dry matter and micotine decreases. By splitting the stalks one day prior to harvesting the output of citric acid is effectively increased.—A. L. BUZNITSKII. *Vsesoyuz. Nauch.-Issledovatel. Inst. Tabach. i Makhoroch. Prom.*, 134 (1938), 17–44; through *Chem. Abstr.*, 33 (1939), 1877. (F. J. S.)

Peppers of Northern Caucasia as a Source of Vitamins. Peppers contain as much as 200–250 mg. of vitamin C per 100 Gm. of fresh material or 1500–5400 mg. per 100 Gm. of dry matter. The variations are due to varietal differences. The vitamin, sugar and acid contents are higher at physiological maturity as compared with technical maturity. By proper breeding it is possible to get hybrids with high sugar and vitamin C content.—L. G. GOMOLYAKO. *Bull. Applied Botany,*

Genetics Plant Breeding (U. S. S. R.), Suppl. 84, *Vitamin Problems* II (1937), 107–116; through *Chem. Abstr.*, 33 (1939), 1366. (F. J. S.)

Provitamin A (Carotene)—Wild Rose as a Source of. *R. amblyotis* and *R. tubrifolia* contain appreciable quantities of carotene. As the fruit ripens, naturally or artificially, the vitamin content increases. Ripening in the dark does not increase the vitamin content.—L. L. PROZOROVSKAYA. *Bull. Applied Botany, Genetics Plant Breeding* (U. S. S. R.), Suppl. 84, *Vitamin Problems*, II (1937), 231–234; through *Chem. Abstr.*, 33 (1939), 1783. (F. J. S.)

Rhubarb and Rhaponticum—Testing of. A brief review of chemical, morphological and histological, and fluorescence tests which have been proposed for the detection or determination or rhaponticum in rhubarb.—ELMER H. WIRTH. *J. Assoc. Official Agr. Chem.*, 21 (1938), 585–587. (A. P.-C.)

Sarsaparilla of Parana. Therapeutic value augments blood cholesterin in immunizing properties. Has anti-hemolytic activity. Useful orally for gastric ulcer. Detailed pharmacognostic description is given of Brazilian species, with plates of histologic structure.—CARLOS STELLFELD. *Tribuna Farm.*, 6 (1938), 5. (G. S. G.)

Spring Herbs—Microscopical Investigation of. Characters for the identification of bladder campion (*Silene inflata*) are described.—V. MOUCKA. *Z. Unters. Lebensm.*, 76 (1938), 247–253; through *J. Soc. Chem. Ind.*, 11 (1938), 1361. (E. G. V.)

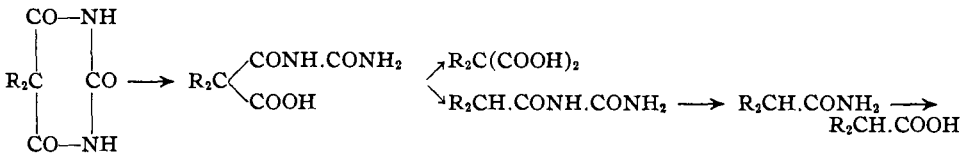
Tropical Seeds and Their Contents—Contribution to the Knowledge of Some. *Torresea cearensis* Fr. Allem (A) was found to be used as a substitute for tonka beans. The seed of A was found to contain only 0.07% coumarin, 28.14% bright yellow oil with a saponification value 198.6, iodine value 116.6, acid value 6.49, free fatty acids 3.26%, refractive index 1.4712. The fruits of *Afzelia africana* Schmitt., of *Prosopis strombulifera* Benth., of *Lacryma Jobi* L., the seeds of Ko-Sam (*Brucea sumatrana* Roxb.), of *Balanites aegyptica* Del. and of *Anatto Bixaorellana* L. are described. Photographs are offered in each case. Thirteen references are given.—FRANZ BERGER. *Scientia Pharm.*, 11 (1938), 122–124. (H. M. B.)

Verbena—Algerian, Cultivation of. The new French Codex has made official the dried leaves of *Lippia citriodora* (*Verveine odorante*). It is cultivated in southern France and in Algeria. The plant is a small shrub, indigenous to South America. Its culture requires a good, fertile and well-drained soil. The plants are propagated from shoots and twigs, and in good years each plantation furnishes three crops. The leaves have a fragrant, lemon-like odor, especially when rubbed between the fingers. The verbena leaves yield about 0.90 to 1% of an essential oil containing 35% of citral. The chief use of the plant is for the preparation of infusions. About four or five leaves are infused in a cup of boiling water, and the infusion strained and sweetened to taste. This makes an agreeable digestive drink.—ANON. *Chemist and Druggist*, 130 (1939), 455. (A. C. DeD.)

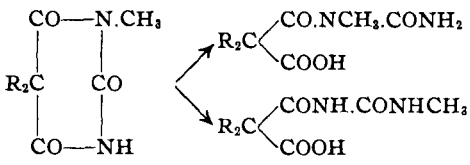
PHARMACY

GALENICAL

Barbituric Acid Derivatives—Decomposition of. The course of the decomposition of substituted barbituric acids is as follows:



Trisubstituted acids may decompose in either of two ways:



The method employed for the analysis of partially decomposed solutions consisted of alternate filtration, extraction with ether, and addition of acid, the operations being repeated at p_H 5 to 5.5, 3 to 3.5 and in fully acid solution. The fractions obtained were examined and, as far as possible, identified. For the experiments on the decomposition of solutions the acids were dissolved with an equivalent quantity of sodium hydroxide, and the solutions were examined after boiling for three hours and also after keeping for eight days at room temperature. The results obtained are summarized in the form of a table. With the exception of diethylbarbituric acid, the yields of the substituted malonuric acids were higher when the solutions were allowed to stand with excess of alkali (1.5 to 2 equivalents).—H. ASPELUND and L. SKOGLUND. *Farm. Notisbl.*, 46 (1937), 81, 98; through *Quart. J. Pharm. Pharmacol.*, 11 (1938), 291. (S. W. G.)

Carotene—Preparation of Colloidal Solutions of. A carotene (I) solution in carbon disulfide is diluted with Me_2CO and ethyl alcohol. The main portion of the carbon disulfide is distilled and hot water vapor is drawn through the solution at reduced pressure to displace the organic solvents. When the latter are removed, the colloidal I is transferred *in vacuo* to evacuated ampuls and sealed. These solutions are stable for several years without loss in color. If the solution contains too much carbon disulfide at the beginning of the preparation, the I coagulates.—S. D. BALAKHOVSKII and F. A. RACHEVSKII. *Bull. biol. med. exptl. U. R. S. S.*, 5 (1938), 519–520 (in French); through *Chem. Abstr.*, 33 (1939), 2653. (F. J. S.)

Dakin Solutions—Production of Durable (Stable) Concentrated. Aqueous sodium hydroxide (1 liter), for example, as a 10% solution, is saturated with boric acid and aluminum chloride (3 Gm.) is added. This solution is then treated with chlorine until precipitation of aluminum hydroxide begins and is finally filtered.—L. MELLERSH-JACKSON. From Sanosa Ges. m. b. H. Brit. Pat. 481,732; through *J. Soc. Chem. Ind.*, 11 (1938), 1295. (E. G. V.)

Enteric Medicaments—Study of Mastic in the Preparation of. Report is made of the efficiency of mastic-talc and mastic-magnesium stearate as enteric coating material and attention was given to the possibility of commercial adaptation. Efficiency was determined by means of radiographs. Method of applying the coatings is described. Tables indicate location of pills when they disintegrated or when last radiograph was taken if they didn't disintegrate. The efficiency of the mastic-talc coating was 48.5% and the mastic-magnesium stearate was 62.5%. The former is not recommended though its efficiency is higher than some materials used commercially. Efficiency of mastic-magnesium stearate is sufficiently high to warrant its recommendation to pharmaceutical manufacturers. Both coatings are applicable to factory methods in which the coating pan is used. A high-boiling solvent like methyl propyl ketone is better to dissolve mastic than a volatile solvent like acetone because no blisters appear in the coating. Amount of material in coating can be determined by finding the average gain in weight. A better degree of enteric efficiency is found if number of pills disintegrating in the small intestine and the ascending colon are used for determination, since absorption from transverse and descending colon is incomplete.—F. S. BUKEY and C. J. KLEMME. *J. Am. Pharm. Assoc.*, 28 (1939), 87. (Z. M. C.)

Ergometrine—Stable Solutions of. The authors found that ascorbic acid increases the preservation of ergometrine solutions. A solution of ergometrine hydrochloride (5 mg. per cc.) containing 10 mg. of ascorbic acid retained full activity for 7 months; after 15 months the loss was 45–50% and after 18 months 70%, while a solution without ascorbic acid lost 50% in the first month and 70% in two months. Activity was tested on the isolated guinea-pig uterus.—A. SALOMON and R. W. SPANHOFF. *Pharm. Weekblad*, 75 (1938), 798. (E. H. W.)

Ergot Preparations. II. Stability of Ergometrine and Ergotoxine Ethanesulfonate in Injection Solutions and Tablets. The stability of aqueous solutions of the two ergot alkaloids above named, without heating, and after heating for 2 hours at 80° C. or one hour at 100° C. was investigated. The ergotoxine salt was less stable; 65% was destroyed in 6 months' storage, when only 19% of the ergometrine was lost. (Solutions not heated.) If ergometrine solution had been heated to 80° C. for 2 hours, after 6 months' storage 35% was lost. If heated to 100° C. for one hour, after 6 months' storage 70% of the ergometrine was lost. Erogmetrine tablets (0.5 mg.) were unaltered in potency after 6 months' storage.—S. A. SCHOU and M. TÖNNESEN. *Dansk Tids. Farm.*, 12 (1938), 268. (C. S. L.)

Galenical Pharmacy and the Future of the Pharmacist. A discussion of the future of the pharmacists and of galenical pharmacy facing the increasing use of pharmaceutical specialties and the decreasing demand for prescription medication in Denmark.—S. A. SCHOU. *Arch. Pharm. og Chemi*, 45 (1938), 669. (C. S. L.)

Hospital Pharmacy—Notes on the Operation of. The author reviewed the difficulties which are encountered in the preparation and preservation of large quantities of Carrel-Dakin solution, compressed yeast tablets, sterile solutions, etc. Suggestions were made as to how these difficulties may be largely overcome and attention was called to several precautions necessary to the operation of a hospital pharmacy.—JOHN CAMERON. *China Med. J.*, 55 (1939), 280. (W. T. S.)

Liquor Eastonii pro Syrupo. Many attempts have been made to produce concentrated liquor for the preparation of Easton's Syrup, but only a limited degree of success has been attained. In the case of Easton's Syrup the components cannot be concentrated into a single solution of four times the strength of the syrup, since concentration leads to heavy precipitation. A simple solution of quinine and phosphoric acid can be made at the desired concentration in the absence of combined phosphate. Precipitation is due to the high concentration of the phosphate radical in depressing the solubility factor of the quinine phosphate below the available dilution. By substitution another radical in place of the phosphoric acid combined with the iron, solubility should remain within the dilution limit available. Ferrous sulfate taken in place of the ferrous acid phosphate reduces the heavy precipitation otherwise experienced, but introduces another difficulty in the formation of a double-ion complex depositing in the form of crystals of the composition $Quinine.H_2SO_4.H_3PO_4$. Ferrous chloride seems to remove all the difficulties of precipitation; but it was observed that, at concentrations greater than that required for the production of a 1 to 3 liquor, or if in company with additional combined phosphate, hard glassy crystals would deposit, having the composition $Quinine.HCl.2H_3PO_4$. Glycerin did not appear to render any service as a solvent, although it might delay precipitation; it seems to act as a diluent in company with water. In summary, there seem to be only two alternatives for consideration in regard to a concentrated liquor: (*a*) a single solution four times the strength of the B. P. syrup, necessitating the use of ferrous chloride in place of ferrous acid phosphate, with subsequent alteration of the official formula; (*b*) retention of the present formula and employing two solutions, each eight times the strength of the official syrup in their respective ingredients, for mixing in equal parts. These solutions are already formulated in the liquors of the B. P. Codex.—A. J. JONES. *Pharm. J.*, 141 (1938), 301. (W. B. B.)

Morphine Content—Changes in, of Opium and Tinctura Opii Simplex During Storage for Ten Years. The content of morphine in opium decreased somewhat in ten years. The content in Tinctura Opii Simplex increased during the same time. It is proposed to store the tincture in alkali-free and air-tight small bottles and avoid storage of more than six to twelve months. Some connection was found between acid number and time of storage of the tincture.—I. NOVAK. *Ber. ungar. pharm. Ges.*, 15 (1939), 13–17; through *Chem. Abstr.*, 33 (1939), 3068. (F. J. S.)

Tinctures—Active Matter in, Made by the Percolation Procedure Prescribed by Pharm. Hung. IV and Its Connection with the Time of Percolation. To obtain sufficiently strong tinctures for quantities of 500 Gm. or less, percolation should be at the rate of 6–8 drops per minute; for 500–1000 Gm. it should be at the rate of 12–16 drops per minute.—Z. BARI. *Magyar Gyógyszerésztud. Társaság Értesitője*, 14 (1938), 599–613; through *Chem. Abstr.*, 33 (1939), 1877. (F. J. S.)

PHARMACOPŒIAS AND FORMULARIES

Extra Pharmacopœia II—Review of the New Edition of. Volume II of Martindale's Extra Pharmacopœia is strikingly different in format, as compared to the previous volume. Although the binding and size of volume II are uniform with volume I, greater use of the larger of the two sizes of type in which the book is printed is noticed. The analytical addenda section, which provides summaries of the standards for drugs and chemicals in foreign pharmacopœias as well as in the B. P. and the B. P. C., has been brought up-to-date by the inclusion of substances in the B. P. Addendum, the U. S. P. XI and the new French Pharmacopœia. The section on chemical nomenclature is entirely new. Recent advances in analysis are given. In the chapter on "Chemotherapy" there is recorded the discovery of the sulfanilamide group of drugs.—ANON. *Pharm. J.*, 141 (1938), 575. (W. B. B.)

Italian Pharmacopœia—Fluidextracts of the. Alterations, means of preserving, control of taste of the alterations and particular chromatic reactions, observations on the results of the control of taste of the various fluidextracts are discussed.—V. ZANOTTI. *Farm. Ital.*, 5 (1937), 466, 528, 587, 649. (A. C. DeD.)

Pharmacopœia—Next British, Probable Additions to. Among the substances which it is understood will be included in the next B. P. which is to be published in 1941 are: sulfanilamide; certain preparations of sex hormones; mandelic acid, possibly in the form of an elixir, for which, of course, it will be necessary to describe the materials employed; halibut liver oil; and some of the vitamins, such as vitamin B_1 and B_2, which recently have been isolated as crystalline substances and for which international standards of potency have been adopted. Very likely standards of assay for tablets, such as aspirin tablets, will be included. A standard process of sterilization for solutions that contain antiseptic agents may be included.—ANON. *Pharm. J.*, 141 (1938), 417. (W. B. B.)

Pharmacopœia—Royal Northern Hospital. The Pharmacopoeia of the Royal Northern Hospital (Great Britain) contains formulæ that are almost without exception sound examples of practical prescribing. In this pharmacopœia, there has been no attempt to secure those petty economies which are a prominent feature of some hospital pharmacopœias. The only representative of the more recently introduced drugs is a mixture of ammonium mandelate containing 50 grains of this salt in one fluidounce and flavored with licorice, syrup, spirit of chloroform, tincture of orange and soluble saccharin. The system followed in the arrangement of the contents, although adopted widely in hospital pharmacopœias, is not one that makes reference to any particular formula very easy, although in the R. N. H. Pharmacopœia an attempt has been made to meet the objection by the inclusion of a comprehensive index. Proofreading appears to have been carefully done, and there are very few misprints.—ANON. *Pharm. J.*, 141 (1938), 497. (W. B. B.)

Swiss Pharmacopœia V—Some Analytical Considerations of. Some of the identity or purity tests prescribed by the Swiss Pharmacopœia for the following are discussed, their weaknesses pointed out and modifications suggested: distilled water, silver nitrate, caffeine sodiobenzoate, extracts (test for heavy metals), hydrastis and potassium iodate for primary standard.—K. SEILER. *Schweiz. Apoth.-Ztg.*, 76 (1938), 589. (M. F. W. D.)

United States Pharmacopœia XI. Commentary.—HERBERT HARMS. *Deut. Apoth. Ztg.*, 53 (1938), 1102–1104, 1187–1190. (H. M. B.)

Water of Crystallization. It is of importance to note the water of crystallization in making solutions of sodium sulfate, calcium chloride, sodium carbonate, etc., and the need for official statement in pharmacopœia as to whether the pure salt shall contain 2 or 6 molecules of water.—EUCLIDES DE CARVALHO. *Bol. Assoc. Brasil. Farm.* (Sept. 1937); through *Trib. Farm.*, 5 (1937), 153. (G. S. G.)

NON-OFFICIAL FORMULÆ

Absorption Bases and Their Uses. Absorption bases are valuable because (1) they are easily prepared and possess great stability; (2) they have remarkable capacity for absorbing water; and (3) they are said to afford ready reabsorption through the skin. Lanolin creams have several disadvantages: (1) they change their color on the surface; (2) the lanolin odor is difficult to conceal; and (3) sticky consistency. Lanolin is capable of absorbing 100 to 200% of water due to cholesterin, meta- and oxycholesterin, cetyl and carnaubyl alcohols but not to sebacic acid esters. Cholesterins are obtained from wool fat by saponification and the extraction of unsaponifiable matter with gasoline. This extract is bleached and purified by fractional crystallization. Cholesterins increase the absorptivity of fats for water and are good emulsifying agents, producing chiefly water-in-oil emulsions. Several formulæ are given for creams. *Cream.*—25% absorption base (extra), 5% paraffin oil (semi-viscous), 0.5% cetyl alcohol, 2% lanolin (light color), 0.3% cholesterin (technically pure), 3% glycerin or diethyl glycol (purest possible), 0.3% calcium glycerophosphate (neutral), 63.9% distilled water. *Liquifying Cream.*—20% absorption base (extra), 5% cetyl alcohol, 5% spermaceti, 10% spermaceti (deodorized), 15–20% bees' wax (white), 50–55% paraffin oil (semi-viscous). *Vitamin A Cream.*—20% absorption base, 5% β-carotin solution in oil (4:1000), 5% avacado oil (decolorized), 3% ceresin, 3% glycerin, 64% distilled water. *Sun Tan Cream.*—20% absorption base (extra), 70% yellow vaseline, 0.5%

methyl umbelliferone, 2% methyl salicylate or valerate, 3% calcium carbonate (precipitated), 3% magnesium carbonate (precipitated), 1% titanium dioxide (pure as possible), 0.5% lavender oil extract. *Skin Oil.*—5% oxycholesterin or absorption base, 15% olive oil (highest quality), 80% paraffin oil (semi-viscous). *Emulsified Skin Oil.*—55% paraffin oil (semi-viscous), 5% oxycholesterin or absorption base, 40% distilled water.—H. JANISTYN. *Am. Perfumer*, 35 (1937), No. 3, 45-46. (G. W. F.)

Cold Creams—Inexpensive Greaseless. An emulsifying agent consisting of diethylene glycol stearate (69%), sodium stearate (4%) and stearic acid (27%) is recommended in preparing the following creams of this type: (1) Emulsifier as above 50 lb., paraffin 75 lb., petrolatum white 45, mineral oil (light technical, white) 5 gals., water 27, potassium carbonate 12 oz. Heat the emulsifier, petrolatum and mineral oil together with slow agitation; temperature not over 90° C. Dissolve the salt in water and heat to 90° C. and add to this the oil solution agitating slowly. Then agitate until cool enough to pour. (2) Emulsifier (as above) 11 parts by weight, petrolatum (white) 8, paraffin 6, mineral oil (light technical, white) 20, water 75, borax 1. Procedure as in (1) except that the oil-wax solution, heated to 90° C., has added to it the aqueous alkaline solution which has been heated to boiling. (3) Emulsifier as above 8 parts by weight, mineral oil as above 3, paraffin 15, petrolatum (white) 7, stearic acid 3X, 1, borax 2, water 100. Procedure as in (2).—CHARLES S. GLICKMAN. *Drug Cosmetic Ind.*, 43 (1938), 556–557. (H. M. B.)

Cosmetic Dermatology. Cetyl Alcohol. Cetyl alcohol in its purest form (100%) is becoming an important ingredient of ointment bases, superfatted cosmetics, lipsticks, rouge, beard softeners, shaving soaps and powders and massage-, vanishing- or tissue-creams. It forms water-absorbent emulsions, facilitates the inclusion of numerous medicaments, is readily included in compounded ointments and is claimed to aid in the passage of certain medicaments through the epidermis. It is insoluble in water and soluble in alcohol, CS_2, $CHCl_3$, ether, glycol and diglycol ethers and benzene. It mixes with fats and oils. It is tasteless, odorless and non-irritating. On application to the skin it renders the surface velvety rather than smooth and slippery. It is not affected by acid, alkali, light or air and does not become rancid. The purest grade of cetyl alcohol is formed by KOH-saponification of spermaceti. An inferior, irritating product is obtained by a recent catalytic reduction process for the production of cetyl alcohol from fats, cetyl palmitate and palmitic acids. Cetyl alcohol is added in about 2 7% concentration to ointment bases, and in lesser concentration to stabilize emulsions. Equal parts of a 2% solution of cetyl alcohol in mineral oil and a 1% solution of soap in water form a thick creamy emulsion showing only a very slight separation on long standing. Cetyl alcohol has been found helpful in creams for eczema and pruritus. A common powder for such cases consists of equal parts of powdered cetyl alcohol and boric acid. Formulæ are given of ointment bases for a scalp pomade, for a colorless lip pomade, for an ointment pencil, etc., containing cetyl alcohol. The preparation of such ointments in the pharmacy is described.—H. GOODMAN and A. SUESS. *Urol. Cutaneous Rev.*, 42 (1938), 909–910; through *Chem. Abstr.*, 33 (1939), 1443. (F. J. S.)

Cosmetics for the skin. (Cont.) Formulæ are given for seventeen liquid deodorants, ten powder deodorants, twelve deodorant creams and five deodorant stocks.—H. JANISTYN. *Seifensieder-Ztg.*, 65; *Der Parfümeur*, 12 (1938), 344–345. (N. L.)

Depilatories. Numerous formulæ taken from the literature are discussed. The active materials are mostly sulfides of alkali or alkaline-earth metals to which various other compounds are added to reduce skin irritation or similar effects.—W. WOLF. *Fette u. Seifen*, 45 (1938), 688–690; through *Chem. Abstr.*, 33 (1939), 3971. (F. J. S.)

Depilatories—Composition of. Sodium sulfide, sodium bisulfite, the sulfides of calcium, barium and strontium and auripigment (an arsenic trisulfide mineral) as components in these preparations are discussed. These preparations are divided into adhesive materials and epilating waxes, liquid products, powders and pastes. Nineteen formulæ are given.—EKMANN. *Riechstoff-Ind. u. Kosmetik*, 10 (1938), 221–227. (H. M. B.)

Face—Agents for the Care of the. Facial toilet waters are discussed and nineteen formulæ offered. The advantages of waters containing high molecular weight sulfur compounds (1 formula) are discussed.—EKMANN. *Riechstoff-Ind. u. Kosmetik*, 13 (1938), 197–203. (H. M. B.)

Face Creams. The author discusses the acid-face creams, nourishing creams, hormone creams and rolling massage creams and gives formulæ for each type.—S. P. JANNAWAY. *Perfumery Essent. Oil Record*, 30 (1939), 165. (A. C. DeD.)

Hand Preparations. A varied selection of formulæ for hand preparations, which are both simple to prepare and profitable to sell, are given.—*Chemist and Druggist*, 129 (1938), 598. (A. C. DeD.)

Manicure Preparations. Typical formulæ for nail polish, nail polish remover, cuticle cream and removers, nail white and bleach, and hand creams, jellies, lotions are given.—S. P. JANNAWAY. *Perfumery Essent. Oil Record*, 29 (1938), 472. (A. C. DeD.)

DISPENSING

Benzocaine. A review on benzocaine, together with several prescriptions in which its use is valuable, namely, teething lotion, antiseptic toothache drops, earache oil, earache drops and a vanishing cream for sun- and wind-burn.—C. C. CLARK. *Can. Pharm. J.*, 72 (1939), 137–138; through *Chem. Abstr.*, 33 (1939), 3069. (F. J. S.)

Cholesterol in Ointments. Report is made of experimental work with cholesterol in ointments. White petrolatum 98 Gm. and cholesterol 2 Gm. is proposed as a base. This base was tried with a number of ointments of ammoniated mercury and ointments of phenyl mercuric nitrate. These ointments were tested for antiseptic value. A tabulation shows test organism, method, width of zone and mercury coefficient. Use of cholesterol in an ointment permits use of large quantities of aqueous solutions or suspensions. Ammoniated mercury ointment made with the proposed base has a higher antiseptic potency than the U. S. P. ointment. Phenyl mercuric nitrate ointment made with an aqueous solution of the salt was distinctly more potent.—PING-LU LI and RUDOLPH A. KUEVER. *J. Am. Pharm. Assoc.*, 27 (1938), 1217. (Z. M. C.)

Cinchona Decoctions—Preparation of, with Hydrochloric Acid and with Sodium Bicarbonate. The studies of the author permit the following conclusions: the preparation of cinchona decoctions with the addition of hydrochloric acid increased the alkaloid content by about 50% and the amount of sugars formed by hydrolysis of the glycosides. The decoction prepared with the addition of sodium bicarbonate is more highly colored but therapeutically less active.—G. GARBARINO. *Fitoterapia.*, 13 (1937), 68; through *Scientia Pharm.*, 9 (1938), 82. (M. F. W. D.)

Culaphtol—Composition of, and a Substitute Formula. Culaphtol, Leo, has been examined as to composition by the Danish Apothecaries Control Laboratory and a corresponding preparation can be made as follows: copper sulfate 5.00 Gm., sodium potassium tartrate 19.75 Gm., normal sodium hydroxide 31.70 cc., distilled water *q. s. ad* 1000 cc. If sterilized by autoclaving or boiling a slight reduction of the copper salt occurs. Alkaline sodium potassium tartrate solutions color yellow on autoclaving.—V. H. MIKKELSEN. *Arch. Pharm. og Chemi*, 45 (1938), 616. (C. S. L.)

Cystine—Decomposition of, in Aqueous Solution. When cystine is boiled in distilled water, cysteine, hydrogen sulfide and sulfur are formed and the decomposition proceeds at essentially the same rate in air as in nitrogen. The various sulfur fractions account for 96.3–100.6% of the original sulfur but not all of the sulfur present at the end of the experimental period could be accounted for as sulfur of cystine, cysteine, hydrogen sulfide and sulfur. There was a progressive decrease in the p_H of the solutions as the time of heating was increased, indicating the formation of decomposition products of an acid nature. No ammonia was liberated from the reaction mixture and presumably no deamination occurred since the total nitrogen content of the cystine solution remained unaltered. The solutions were boiled for intervals of 0.5–48 hours and the relationship between the decomposition and the time of heating was approximately linear.—J. I. ROUTH. *J. Biol. Chem.*, 126 (1938), 147 154; through *Chem. Abstr.*, 33 (1939), 534. (F. J. S.)

Enteric Pills—Preparation of. Pills with various coatings were compared in artificial gastric juice, in 0.5% sodium carbonate solution and radioscopically *in vivo*. Gluten, salol and simple keratin coatings were unsatisfactory. Zein, keratin over sandarac-tolu mixture and formaldehyde-treated gelatin coatings gave good results. The salol coating did not dissolve in any case.—C. LEYTON and M. PENAFIEL. *Anales quim. farm.* (Chile), (1938), 23–29; through *Chem. Abstr.*, 33 (1939), 2282. (F. J. S.)

Homeopathic Prescription. The author presents a rather complete discussion of the form of the homeopathic prescription, the abbreviations used and their significance and the differences between the French and German schools. Numerous examples are included.—KARL HAAS. *Schweiz. Apoth.-Ztg.*, 76 (1938), 661–668. (M. F. W. D.)

Homogenization Apparatus. A description of a laboratory size, hand operated homogenizer in the laboratory of the Technical Division of the Royal Swedish Pharmaceutical Institute. Microphotographs show the differences in dispersion of various oil emulsions before and after homogenization.—G. KÄLLROT. *Farm. Revy.*, 37 (1938), 733. (C. S. L.)

It Can Be Done, Series No. 18. Another of the series of difficult or unusual prescriptions with directions for overcoming the incompatibilities.—J. LEON LASCOFF. *J. Am. Pharm. Assoc.*, 28 (1939), 163. (Z. M. C.)

Linimentum Calcis with Ichthyol. The author describes the difficulties of mixing lime liniment and ichthyol. Linimentum Calcis is a water-in-oil emulsion which separates in the presence of alkali ions; in this case ammonia. Van der Wiele attempted to eliminate this by preparing calcium ichthyolate, but no permanent emulsion has as yet been prepared in that way. The lime liniment is somewhat unstable, and the antagonistic action of the ammonium ion through mass action, in a reverse sense, must be prevented. This may be brought about by the addition of slaked lime; the ichthyol probably being partially changed to calcium ichthyolate. The article directs: Linimentum Calcis 50, ichthyol 2.5, calcium hydroxide 1. As a rule 0.8 to 1.05 Gm. of lime are necessary. The liniment is mixed with the ichthyol whereupon the emulsion is broken; the powdered lime is then added slowly with constant stirring until the emulsion again forms. The emulsion is a beautiful one; it is a water-oil emulsion which by homogenizing and upon standing becomes very thick, so that it must be dispensed in a wide-mouth bottle. Magnesium oxide may also be used to restore the broken emulsion. This emulsion, viewed under the microscope, is less finely divided and does not become thick on standing. The ichthyol is in the oil-phase in these emulsions, the emulsion remaining in the type water-oil, which is of therapeutic interest since the cell walls of the epidermis probably contain water-oil emulsions of high viscosity themselves.—E. VERSTRAETE. *Vlaamsche Pharmaceutisch Tijdschrift*, 1 (1938), 7; through *Pharm. Weekblad*, 75 (1938), 365. (E. H. W.)

Liquid Petrolatum—Preparation of Emulsions of. A large number of liquid emulsions prepared as recommended by the pharmacopœias of different countries were examined microscopically. None of them contained the petrolatum in a uniform degree of emulsion. A formula is given with details for the preparation of a homogeneous emulsion containing 50% of liquid petrolatum.—J. E. MACHADO and J. SONOL. *Rev. facultad cienc. quim.* (Univ. nacl. La Plata), 12 (1937), 47–78; through *Chem. Abstr.*, 33 (1939), 2282. (F. J. S.)

Normalax—Substitute Formula for. Normalax contains 60% bassorin and 9% frangula bark, with cocoa and sugar. A substitute formula is cited: Gum sterculia (fine granules) 600 Gm., pulverized frangula bark (No. 20 sieve) 90 Gm., magnesium oxide, 10 Gm., mixture of cocoa powder 85 Gm., with talcum 15 Gm., of the mixture *q. s.* and of a mixture of sugar syrup 100 Gm. with concentrated spirit 10 Gm., *q. s.* for granulation. The granulation technic is cited.—A. T. NIELSEN. *Arch. Pharm. og Chemi*, 45 (1938), 730. (C. S. L.)

Phenylmercuric Acetate—Veterinary Preparation of an Elastic Suppository of. For application in the cervical canal of the uterus of cows or mares in metritis the following formula is recommended: White gelatin 70 Gm., distilled water 105 Gm., phenyl mercuric acetate 1 Gm., glycerine 220 Gm., kaolin 144 Gm., makes 100 elastic suppositories or rods of 9–10 mm. diameter and length 60 mm., inclusive of a tip portion 12 mm. long. Preparation method is cited. The rods melt at body temperature.—A. LANNUNG. *Arch. Pharm. og Chemi*, 45 (1938), 613. (C. S. L.)

Prescription—Survey of the Present-Day. A survey investigated the following points: writing habits and peculiarities of physicans; whether any significant proportion of our prescriptions contain vitamins, barbiturates and glandular products; frequency of proprietary products compared with official ingredients. Seven per cent of prescriptions with pencil, less than 25% are in Latin, 87% use the apothecary system. Some percentages of different types of prescriptions are given. Vitamins and glandular products make 20% or more of the dollar volume. More than 11% contain barbiturates. Proprietaries constitute 32% of the total.—FREDERICK LASOWSKY. *J. Am. Pharm. Assoc.*, 28 (1939), 96. (Z. M. C.)

Pulvis Ipecacuanhæ—Standardized Preparation of. The variations in the content of active matter of commercial ipecac powders make the preparation of extracts of a given active matter content very difficult. It is proposed to determine the alkaloid content of the powder (ranging generally between 2.7 and 2.9%) and mix it with weighed amounts of lactose so as to obtain a mixture containing exactly 2.0% active matter. This mixture can be stored in small, air-tight bottles and extracts can be prepared easily if wanted.—I. NOVAK. *Ber. ungar. pharm. Ges.*, 15 (1939), 43–46; through *Chem. Abstr.*, 33 (1939), 3068. (F. J. S.)

Sterilized Water for Injections. In the preparation of a solution, using sterilized water, contamination may occur at least from the non-sterile medicament. It is contended that in preparations of the following where final sterilization is carried out by autoclaving or by filtration, the use of previously sterilized water is unnecessary: bismuth, B. P. (Addendum); iron, B. P.; iron and arsenic, B. P. C.; morphine, B. P.; peptone, B. P. C.; quinine and urethane, B. P. C.; sodium chloride and acacia, B. P. (Addendum); strychnine, B. P. C. All of these injections may be sterilized by autoclaving or by filtration. Where sterilization is not ultimately carried out, the water used should be freshly distilled. When tyndallization is employed, sterilized distilled water should be used in the preparation of the solution. Sterilized water should also be used in the preparation of all injections which undergo no final sterilization, aseptic precautions being taken.—G. W. G. SMITHERS. *Pharm. J.*, 141 (1938), 438. (W. B. B.)

Suppositories—Higher Alcohols as Excipients for. The advantages of adding cetyl alcohol (0.60 Gm.) to cacao butter (24 Gm.) in preparing a vehicle for suppositories are discussed together with the use of the higher alcohols in the preparation of masses, creams and emulsions.—A. FERRARIS. *Boll. chim. farm.*, 77 (1938), 725–727; through *Chem. Abstr.*, 33 (1939), 3065. (F. J. S.)

Talc—Applications of.—H. WIESENTHAL. *Teer u. Bitumen*, 36 (1938), 297–299; through *J. Soc. Chem. Ind.*, 11 (1938), 1293. (E. G. V.)

PHARMACEUTICAL HISTORY

Alum—History of. Although the preparation of $KAl(SO_4)_2.12H_2O$ was not begun until the early middle ages somewhere in Asia Minor, the manufacture of alum in Bohemia (from raw materials in the carboniferous system) is mentioned in 1407. The raw material consisted of alum slates which were leached with water and then treated with old urines precipitating $NH_4Al(SO_4)_2.12H_2O$. Alums were also prepared at Cachovice (1544), Chomutov (1558) and Mukacevo (1792).—J. FLEK. *Chem. Obzor*, 13 (1938), 76–78, 97–99, 121–122, 141–144; through *Chem. Abstr.*, 33 (1939), 936. (E. G. V.)

Austrian Pharmaceutical Society—65th Year of the. A review of the activities of the society.—O. ZEKERT. *Scientia Pharm.*, 11 (1938), 125–126. (H. M. B.)

Bag—in the, for Ninety Years. The author describes some of the interesting things found in a pair of saddle bags owned and used by Dr. Ezra Smith Parke, father of one of the founders of Parke, Davis and Company.—WALTER M. CHASE. *J. Am. Pharm. Assoc.*, 27 (1938), 1262. (Z. M. C.)

Calamine—History of. The report considers derivation of name, the first use of term zinc, comments on lapis calaminaris, smithsonite and analysis of calamine.—HELEN L. CREECH and C. O. LEE. *J. Am. Pharm. Assoc.*, 28 (1939), 116. (Z. M. C.)

Friesland in Pharmacy. An historical account of Pharmacy in Friesland.—P. VAN DER WIELEN. *Pharm. Weekblad*, 75 (1938), 735. (E. H. W.)

German Apothecaries as Collectors of Folk Lore and Songs. Historical.—RODERICK WALD. *Wien Pharm. Wochschr.*, 71 (1938), 220–222. (H. M. B.)

German Pharmacy—First Years of, as an Independent Science. An address.—H. KAISER. *Suddeut. Apoth.-Ztg.*, 79 (1939), 29–31, 34–42; through *Chem. Abstr.*, 33 (1939), 2652. (F. J. S.)

History and Etymology of the Elements. A concise review of all the known elements.—M. CRABBE. *J. pharm. Belg.*, 20 (1938), 592–595, 614–617. (S. W. G.)

Olive Oil—Recovery of. This is one of the Berolzheimer series of alchemical and historical reproductions. It represents the process of olive oil extraction as practiced about 1570. The original painter was Giovanni Stradano (1536–1605).—*Ind. Eng. Chem.*, 31 (1939), 189. (E. G. V.)

Pharmaceutical Collections in the Friesland Museum. A description of this collection is given.—P. SPAANDER. *Pharm. Weekblad*, 75 (1938), 729. (E. H. W.)

Pharmacist in Old Solothurn (Switzerland). History of the first pharmacies in Solothurn. —F. SCHUBIGER. *Schweiz. Apoth.-Ztg.*, 76 (1938), 505. (M. F. W. D.)

Pharmacy—Bio-Bibliography of the History of. A review of the history of pharmacy by Giovanni Carbonelli is given.—U. TERGOLINA-GISLANZONI-BRASCO. *Farm. ital.*, 5 (1937), 517. (A. C. DeD.)

Purgatives of the Sixteenth and Seventeenth Centuries. A summary of the therapeutic uses and pharmaceutical preparations of calomel, rhubarb, senna, jalap, aloes and other vegetable drugs known during the sixteenth and seventeenth centuries.—A. SÜSSENGUTH. *Pharm. Zentralhalle*, 79 (1938), 620–623. (N. L.)

PHARMACEUTICAL EDUCATION

Biochemistry—Teaching of, to Medical Students. Didactic work is taught to small groups by the conference method. In the practical work, emphasis is placed upon the quality rather than the quantity of work done.—S. BLISS. *J. Assoc. Am. Med. Colleges*, 14 (1939), 50–52; through *Chem. Abstr.*, 33 (1939), 2543. (F. J. S.)

Grades in a Pharmacy School—Influence of Working and Study Hours upon. Report is made of grades of students, average number of hours at outside work and available study hours. Results seem to indicate that students working most had the best grades.—L. K. DARBAKER. *J. Am. Pharm. Assoc.*, 28 (1939), 110. (Z. M. C.)

Hospital Pharmacy Interneships. A description of what sort of work is given and how it is managed at the University of Michigan Hospitals.—H. A. K. WHITNEY. *J. Am. Pharm. Assoc.*, 28 (1939), 167. (Z. M. C.)

Pharmacist and His Function in Gas Protection. A discussion of the function of the pharmacist during gas raids and attacks.—TAUBER. *Wien. Pharm. Wschr.*, 71 (1938), 94. (M. F. W. D.)

Scientific Literature—Co-Ordination of. A scheme for improved publication and abstracting comprises: (1) the recognition of a limited number of periodicals as the correct medium for publication of work; (2) the preparation of their own short abstracts by all authors; (3) such abstracts to be checked as to form and accuracy by the editors, and copies to be sent separately to organizations publishing periodical bibliographies. The relation of books, theses, patents, etc., to the scheme is discussed. The scheme would save both time and money. The necessity of a complete national library, and the advantages of air-conditioning in a library, are pointed out. A detailed criticism is given of the Universal Decimal Classification, which is shown to contain fundamental illogicalities, to be inflexible, too largely open to error, and unsuitable for use except by a few experts. It is shown that the system cannot be stable, so that reclassification is always necessary.—J. LEWKOWITSCH. *Chemistry and Industry*, 57 (1938), 1199–1205. (E. G. V.)

PHARMACEUTICAL LEGISLATION

Drugs and Cosmetics—Dyes for. A list of ninety-three coal tar dyes believed to cover all requirements to manufacturers of foods, drugs and cosmetics has been compiled by the U. S. Food and Drug Administration of the Department of Agriculture. Manufacturers and importers of dyes are urged to submit samples of their products for certification without delay. This list is included.—ANON. *Perfumery Essent. Oil Record*, 29 (1938), 385. (A. C. DeD.)

Histology. Its Importance in Pharmaceutical Education and Legislation. Endocrinology shows increasing importance in medicine and developments in medicine, if concerned with dispensing of therapeutic agents, become of interest to pharmacists. Reasons for the introduction of histology into curricula are discussed. From the legislative standpoint it should be remembered that these products are involved in court trials and pharmacists should know what they are handling.—FREDERICK GRILL. *J. Am. Pharm. Assoc.*, 28 (1939), 177. (Z. M. C.)

Java Citronella Oil. Official survey of the new regulations is given.—ANON. *Perfumery Essent. Oil Record*, 30 (1939), 180. (A. C. DeD.)

Opium—International Control of. The History of the Past Thirty Years. Passages from an address covering developments concerning international opium control over a thirty-year period.—ANON. *Pharm. J.*, 141 (1938), 415. (W. B. B.)

Patent Litigation in 1938. A review of the outstanding decisions.—N. LITTELL. *Ind. Eng. Chem.*, 31 (1939), 120–123. (E. G. V.)

Pharmacy—Regulation of, in Germany, Switzerland and Italy. The official control of pharmacy, schools of pharmacy, duties of the pharmacist in air raid protection of civilians in Germany, the requirements of admission and courses of study in pharmacy schools, the working conditions and stipends of apothecaries and their assistants, are considered. The German pharmaceutical industry is also discussed.—A. BERG. *Farm. Revy.*, 37 (1938), 770, 789, 811. (C. S. L.)

Professional Pharmacy—Recent National Legislation Affecting. Subjects considered are marihuana taxing law, the source of and tax on distilled spirits, including alcohol, venereal disease control act, fair labor standards act, federal trade commission act, Federal Food, Drug and Cosmetic Act and regulations under the Harrison Act.—E. F. KELLY. *J. Am. Pharm. Assoc.*, 28 (1939), 113. (Z. M. C.)

Specialties and Nostrums in Prescription Stock—Control of. Suggestions are offered in order to promote discussion out of which some plan for control may evolve. There are four classes of remedies: (1) official, (2) open formulæ of reputable pharmaceutical houses, (3) nostrums, which are secret formulæ, and (4) private formulæ. There is little to criticize in official formulæ. Ten suggestions are made relative to decisions concerning the other three.—JOHN F. MCCLOSKEY. *J. Am. Pharm. Assoc.*, 27 (1938), 487. (Z. M. C.)

Specialty Drug Laws—Administration of, in the Northern Countries. A lecture given before the Northern Apothecaries Congress in Helsingfors. The northern European countries have led in the establishment of official control of the introduction of drug specialties. Sweden innovated such control in 1914. Examinations of manufacturers' claims by the Swedish Apothecaries Control Laboratory began in 1923. Much credit is given to Dr. A. Rising for his work in furtherance of this control after 1927. In 1934 governmental control was instituted in Sweden. The principal difference in the official governmental control lay in the registration of, and study of, specialties already on the market, as well as new offerings, whereas the Apothecaries Society control had previously considered only new offerings. This official control of all specialties now holds in Sweden and Norway. In Denmark and Finland only new offerings are controlled by the official commissions. Differences of administration of control in the various Scandinavian countries are discussed. Under the Swedish laws protecting freedom of the press, advertising claims cannot be controlled prior to their issue, but after issue are examined by the control commission and if unsatisfactory the registration of the product may be canceled. The usefulness of these controls in banishing from the apothecary shops preparations of no therapeutic value ("humbug preparations") is lauded. The plan to establish a joint northern country (Nordiska) specialty commission is held to constitute a further useful advance.—H. PALME. *Arch. Pharm. og Chemi*, 45 (1938), 541 (in Swedish). (C. S. L.)

PHARMACEUTICAL ECONOMICS

Ointments in Hospitals—Economy of Manufacturing. The author directs attention to the great saving to a hospital if ointments are prepared there instead of purchased, particularly if made in quantity by means of motor-driven mills. A list of common ointments with the saving per pound is included. LOUISE F. SCHMITZ. *J. Am. Pharm. Assoc.*, 27 (1938), 1244. (Z. M. C.)

Pharmaceutical Ethics *vs.* Economics. The author begins her discussion by asking several pertinent questions and goes on to show that economics of Pharmacy should be interpreted and controlled in "terms of statistical pharmaceutical history." Statistics are available from the Bureau of Foreign and Domestic Commerce, the Bureau of Census and a number of other sources. He should spend less time selling food and more time building up his prescription business, he should reclaim the business now done by dispensing physician, he should develop business in reagents for physicians, chemicals used in industries and in numerous other ways where department stores and grocery stores are now doing business.—B. OLIVE COLE. *J. Am. Pharm. Assoc.*, 27 (1938), 1251. (Z. M. C.)

Pharmacy—a Balance Sheet of. The author discusses the following liabilities: increase in prescriptions calling solely for proprietaries; multiplicity of these proprietaries; coined trade names; hospitalization plans and insurances; notoriety due to illegal sale of liquor and abuse of licenses by a few unscrupulous persons; and misleading advertising. Assets are the following: Fair Trade laws; increase in own-label produets; modernization of physical assets; availability of "review lectures" and "clinics;" the use of the radio to advertise the profession of pharmacy;

prevalence of prerequisite laws; the new Federal Food Drug and Cosmetic Act. The last-named asset is discussed at some length.—J. H. GOODNESS. *J. Am. Pharm. Assoc.*, 27 (1938), 1255. (Z. M. C.)

Prescriptions—Fair Pricing of. The author submits a new scheme for pricing prescriptions. —EDWARD S. ROSE. *J. Am. Pharm. Assoc.*, 27 (1938), 1238. (Z. M. C.)

Therapeutics Committee. Purposes of the committee include recommendations relative to additions to and deletions from the stock carried; functions which the committee should assume; policy of operation; and other recommendations upon pharmaceutical problems that may appear necessary from time to time. Sub-titles show scope of the paper: drug policy, professional stores policy, formulary, narcotic regulations, the writing of narcotic prescriptions.—ROGER K. LAGER. *J. Am. Pharm. Assoc.*, 28 (1939), 171. (Z. M. C.)

MISCELLANEOUS

Ampuls—Investigation into the Limit of Alkalinity of. The main requirements of glass used in ampul manufacture are: (1) it must not be of too high melting point, so that it can be readily manipulated; (2) it must break with a clean fracture, and not splinter or granulate, and be tough; (3) the finished ampul should yield little or no free alkali from the surface. The authors have carried out extensive work on a modification of the B. P. "Whole Ampoule" test, using the various types of ampuls specified in the British Standards Specifications. Eleven detailed tables are given to demonstrate how the various types of ampuls measure up to the specifications when tested by the official methods, but some makes of ampuls fail to pass the authors' modified tests.—H. GARTSIDE and J. PRITCHARD. *Pharm. J.*, 141 (1938), 651, 675. (W. B. B.)

Aspirin Tablet—Saccharin. A tablet containing acetylsalicylic acid in therapeutic quantity contains an amount of saccharin much less than that of aspirin but sufficient to mask the taste and to increase the rate of absorption of the aspirin.—JACOB A. GLASSMAN. U. S. pat. 2,134,715, Nov. 1, 1938. (A. P.-C.)

Body Secretions—Deodorizing. A deodorizing composition is prepared from an aldehyde or ketone compound such as hexamethylenetetramine together with an aromatic acid such as salicylic acid and a stabilizer such as methyl-*p*-hydroxybenzoate capable of combining with any formaldehyde liberated to avoid corrosive or irritating action and render the composition suitable for contact with mucous membranes.—JAMES W. H. RANDALL and HUBERT VAN GRUNENBERG. U. S. pat. 2,131,235, Sept. 27, 1938. (A. P.-C.)

Cetyl Alcohol in Cosmetics. Cetyl alcohol, $C_{16}H_{33}OH$, occurs as an odorless, tasteless, solid fatty alcohol of wax-like consistency; it exists in many waxes of animal origin, particularly spermaceti, from which it is generally obtained. Another source is vegetable oils such as cocoanut, from which it is obtained by hydrogenation. Cetyl alcohol is suitable for incorporation, in varying proportions, in a large number of cosmetic preparations and produces a velvety feeling on the skin when applied in suitable admixture. A number of examples of the wide range of preparations in which cetyl alcohol may be incorporated are given.—ANON. *Chemist and Druggist*, 129 (1938), 219. (A. C. DeD.)

Chemicals and Drugs—Fine, Recent Advances in. A review of the past year's work.—E. R. C. EDYVEAN. *Chemistry and Industry*, 57 (1938), 1155–1157. (E. G. V.)

Cosmetic Irritants. A summary.—L. TULIPAN. *Arch. Dermatol. Syphilol.*, 38 (1938), 906–917; through *Chem. Abstr.*, 33 (1939), 1439. (F. J. S.)

Detergents for Domestic Purposes—Manufacture of, from Fatty Alcohol Sulfonates. Aliphatic alcohol sulfonates (I) can be used as domestic detergents when mixed with suitable substances, for example, stearin and cetyl alcohol, which produce readily moldable masses and form aqueous emulsions easily. I may be used in hair washes when, for example, methylcellulose is added to decrease the drying effect on the hair. The preparations are neutral, produce abundant non-irritant lather and do not reduce the neutral fat content of the skin or hair.—A. BOHANES. *Chem. Obzor*, 13 (1938), 70–73; through *J. Soc. Chem. Ind.*, 57 (1938), 1447–1448. (E. G. V.)

Fluorides—Sulfamic Acid. By reaction of a fluoride such as potassium, sodium or zinc fluoride upon the chlorides of dimethyl sulfamic acid, diethylsulfamic acid, β,β-dichlorodiethylamine, piperidine, morpholine, β,β-dicyanodiethylamine, methylhexylamine, methyldodecylamine, etc., corresponding fluorides are formed which are suitable for use as insecticides.—

GERHARD SCHRADER and OTTO BAYER, assignors to WINTHROP CHEMICAL CO. U. S. pat. 2,130,038, Sept. 13, 1938. (A. P.-C.)

Hirudin—Preparation of. A discussion of three recent methods.—ANON. *Deut. Apoth. Ztg.*, 53 (1938), 1229. (H. M. B.)

Hormones—Use of, in Cosmetics. A review of the application and use of hormones in cosmetic preparations.—H. SCHWARZ. *Seifensieder-Ztg.*, 65; *Der Parfümeur*, 12 (1938), 664. (N. L.)

Insecticides. Insecticides adapted to be applied as a spray containing minute drops comprise a volatile material capable of dissolving fats, waxes, etc., and liquid at ordinary temperature and pressure together with a normally gaseous material comprising essentially a hydrocarbon having a boiling point below −20° C. under ordinary conditions, the gaseous material being dissolved in the liquid in a quantity sufficient to saturate the liquid with gas under a pressure of several atmospheres at normal temperature and an additional small percentage of a gaseous hydrocarbon having a considerably lower boiling point than the first-mentioned hydrocarbon. Suitable ingredients are propane containing methane in small proportion.—ERIK ROTHEIM. U. S. pat. 2,128,433, Aug. 30, 1938. (A. P.-C.)

Kaolins—Study of the Ukrainian, with the Purpose of Using Them in Medicine. It was found that with the purest samples, the adsorptive capacity increases with the activation; however, the method of activation changes the adsorptive capacity quantitatively as well as qualitatively.—J. FIALKOV, G. WEISMAN and L. KOROSTYSHEVSKY. *Trans. Ukrainian Inst. Exp. Pharm.*, 1 (1938), 107. (C. J.)

Mixers in the Process Industries. The specific mixer which will give the best final results depends on a number of translation factors, the investigation of which is of greatest importance. Translation, the hardest mechanical step, is greatly simplified by such analysis. The choice of materials of construction is the responsibility of the user, to be influenced, however, by the workability of the choice into desirable equipment. The design of the mechanical features of mixing equipment plays an important part in assuring continuous service.—G. MACLEAN and E. J. LYONS. *Ind. Eng. Chem.*, 30 (1938), 489–492. (E. G. V.)

Mixers—Propeller Type. The wide use of propeller-type agitators is discussed. A questionaire in the form of a mixing problem work sheet is given.—E. S. BISSELL. *Ind. Eng. Chem.*, 30 (1938), 493–496. (E. G. V.)

Paragenoses—Nature of. The author describes those substances which, when added to perfumes, whether deliberately or involuntarily, have a very marked influence on the olfactive effects as paragenoses. Paragenoses with beneficial effect were termed positive, those showing contrary effects, negative. The author describes the phenomenon of paragenoses fully.—A. MULLER. *Perfumery Essent. Oil Record*, 29 (1938), 230. (A. C. DeD.)

Perfume Bases—Application of Little-Used Flower Oils as. *Narcissus Jonquilla* L., *Dianthus caryophyllus* L., *Acacia dealbata* Link (Mimosa), *Hyacinthus orientalis* L., Narcissus, *Spartium junceum* L. (Broom), *Sambucus ebulus* L. (Elder), *Anthoxanthum odoratum* L. (Scent grass) and Patchouly, their uses and production are described.—L. LABAUNE. *Riechstoff-Ind. u. Kosmetik*, 13 (1938), 191–196. (H. M. B.)

Per Salts in Pharmaceutical Use. The chemistry and preparation and the chemical, pharmacological and physiological properties of the persulfates, perborates and percarbonates are described. Short descriptions of the pharmaceutic preparations, Persodina Lumiere, Persulfovanadina, Noel Bottu, Borodat, Perborax, Pergenol and Ozet-Bad are given.—D. GIOVANNI. *Boll. chim. farm.*, 77 (1938), 637–641; through *Chem. Abstr.*, 33 (1939), 1875. (F. J. S.)

Petrolatums—Medicinal, Best Conditions for the Preparation of. Activated "gumbrin" clay is best for bleaching petrolatum. Untreated "gumbrin" is unstable in water and its mechanical strength is unsatisfactory. "Nal'chikhin" clay in its natural as well as activated state is very strong mechanically and resistant to water but is inferior in its bleaching qualities to "gumbrin." The highest suitable concentration of sulfuric acid to be used in treating clays is 40%. "Nal'chikhin" clay is difficult to regenerate by burning as well as with alcoholic benzene. "Gumbrin" loses very little of its activity when regenerated by heating to 500°. Coarse-grain clay should be heated at not over 180–200°. The experiments are described.—R. A. KADANOVSKAYA. *Azerbaidzhanskoe Neftyanoe Khoz.*, 2 (1938), 53–57; through *Chem. Abstr.*, 33 (1939), 3067. (F. J. S.)

Pipettes and Viscometers—Drainage of. Errors due to incomplete drainage of several types of liquids from pipettes and viscometers were discussed. The authors found that pipettes having the shape of a double cone were superior to those of the more conventional cylindrical and spherical shapes.—GRINNELL JONES and EDNA FERRELL. *J. Chem. Soc.* (London) (1939), 325. (W. T. S.)

Porpoise Blubber—Composition of. Porpoise and dolphin fat cannot be used for food because of the flavor and high butyric acid content (27%). The fat could be used as a source of butyric acid and its esters, and as a perfume fixative, a base for cosmetics or as a pomade ingredient.—N. V. WILLIAMS and B. B. KLUBOVA. *Schr. zentr. Forsch.-Inst. Lebensmittelchem.* (U. S. S. R.), 4 (1935), 166–169; through *J. Soc. Chem. Ind.*, 11 (1938), 1321. (E. G. V.)

Potassium Chlorate in Toothpastes. A review of the antiseptic activity and therapeutic value of potassium chlorate in the preparation of toothpastes.—H. SCHWARZ. *Seifensieder-Ztg.*, 65; *Der Parfümeur*, 12 (1938), 161–162. (N. L.)

Radix Belladonnæ in New Dress. Reference is had to a decoction of belladonna root with medicinal charcoal and camphor current in Bulgaria as the "Bulgarische Kue" for chronic epidemic encephalitis with Parkinson phenomena.—A. DORNER. *Suddeut. Apoth.-Ztg.*, 79 (1939), 22; through *Chem. Abstr.*, 33 (1939), 2652. (F. J. S.)

Raspberry Juice—Preparation of, with Filtration Enzyme. The juice may be easily pressed and filtered by adding Filtragol to the unfermented fruit mash.—ZIMMERMAN and MALSCH. *Destillateur u. Likorfabr.*, 49 (1936), 448–450; through *J. Soc. Chem. Ind.*, 57 (1938), 1492. (E. G. V.)

Sapamines. The uses of sapamine and its homologs in the preparation of emulsions and cosmetics are briefly discussed. Sapamine is $Me(CH_2)_7CH:CH(CH_2)_7CONHCH_2CH_2NEt_2$.—A. PFISTER. *Anales quim. farm.* (Chile) (1938), 14–17; through *Chem. Abstr.*, 33 (1939), 2282. (F. J. S.)

Shaving Creams and Soaps. The author describes the compounding and manufacture of the old style shaving creams, brushless shaving creams and shaving soaps.—S. P. JANNAWAY. *Perfumery Essent. Oil Record*, 29 (1938), 354. (A. C. DeD.)

Styptics. This class of therapeutic agents are discussed emphasizing recent contributions. Twenty-four references are given.—M. A. LESSER. *Drug Cosmetic Ind.*, 43 (1938), 552–555. (H. M. B.)

Tooth-Cleansing Material. A solid artificial resin such as one formed from formaldehyde and cyanamide is used in powdered form as a tooth-cleansing material (suitably with glycerin and various other admixtures).—HANS SCHMIDT, assignor to WINTHROP CHEMICAL CO. U. S. pat. 2,130,034, Sept. 13, 1938. (A. P.-C.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Aconitine—Action of Magnesium on Poisoning with. The action of magnesium salts on aconitine poisoning was studied on cats, rabbits and the heart-lung preparations of dogs. Aconitine causes heart arrhythmias in cats which resemble closely the results of aconitine poisoning in dogs described extensively by Scherf. Similar extra systoles can be produced in the isolated heart (heat-lung preparations of dogs). The paralyzing action of large doses of magnesium salts on the production and conduction of the stimulus and the contractility of the heart observed in dogs by Rothberger and Zwillinger was also seen in the studies on cats. A comparison of magnesium chloride, sulfate and gluconate solutions with equivalent amounts of magnesium showed that the inorganic salts all cause the same quantitative effect on the heart and blood pressure; on the other hand, the gluconate, while giving an equal effect on the heart, produces less fall in blood pressure. Aconitine arrhythmias were abolished by intravenous injections of magnesium salts in solution. The abolition of the extra systoles and the return to sinus rhythm proceed in stages through a progressive depression of the secondary sources of stimuli. The regulating action of magnesium is transient but can be reproduced. Under the influence of magnesium, cats tolerate 2.5 to 3 times the fatal dose of aconitine. The treatment with magnesium salts assures rabbits of a protection against fatal intravenous doses of aconitine; the animals survive and recover quickly. The action depends on the prevention of the fibrillation tendency of the heart by magnesium; the rapid recovery from the toxic symptoms is in part dependent on the

accelerated removal of the aconitine resulting from the diuresis produced by the magnesium salts. The mechanism of the magnesium action, its similarity to potassium and its differences from the action of quinine are pointed out. Further, reference is made to the possibility of using the experimental results in the therapeutic treatment of aconitine poisoning in man.—E. E. HUEBER and D. LEHR. *Naunyn-Schmiedeberg's Arch.*, 189 (1938), 25; through *Scientia Pharm.*, 9 (1938), 102. (M. F. W. D.)

Adrenaline Hyperglycemia—Action of Aqueous Extract of Pineal Gland on. An injection at the same time of aqueous extract of pineal gland does not change in rabbits the sugar line from 0.1 mg. of adrenaline, but, on the other hand, it has a certain braking action on the hyperglycemia from smaller doses (1/20–1/40 mg.) of adrenaline.—G. FRADA. *Biochim. terap. sper.*, 25 (1938), 315. (A. C. DeD.)

Analeptics—Clinical Experience with Newer. The authors have made a rather extensive trial of Metrazol, picrotoxin and coramine in a variety of cases where great depression of the central nervous system resulted from the use of sedative or hypnotic drugs, opiates, intravenous anesthetics and ether. On the whole, they found Metrazol and picrotoxin to be valuable agents for combating the depressive effects of barbiturate poisoning, morphine overdose and too deep ether anesthesia. The drugs were of little value in combating surgical shock. The authors advocate giving multiple small doses of these analeptics, waiting between doses to observe the effects. Patients may be given repeated injections until they begin to show signs of awakening, or until abnormal motor excitability is manifested by muscular twitchings. This repetition of small intravenous doses is the essential feature characterizing the proper technic of using picrotoxin as an analeptic.—BURSTEIN and ROVENSTINE. *Anesthesia and Analgesia*, 16 (1937) 151; through *Abbott Abstract Service* (1937), No. 368. (F. J. S.)

Anesthesia—Recent Advances in. Anesthesia by inhalant is facilitated by use of intratracheal tube inserted through nostril. Contributes to quieter respiration, and allows better access to patient by surgeon and assistant. Use of tribromethanol by rectum is also advantageous for patient, and to maintain fireproof conditions. Cyclopropane may be used only in that concentration which does not markedly affect the pulse. A barbiturate, morphine and atropine are useful for preliminary medication, half given the night before. Tribromethanol by rectum in basal anesthetic doses good to use for children. Local regional and spinal anesthesia combine well with general anesthesia. Field blocks minimize amount of general anesthetic needed. Safest agent procaine, next metycaine. Procaine epinephrine in perdural injection used as substitute for spinal anesthesia; value depends on experience. Evipal and pentothal sodium used intravenously for brief anesthesia. Intravenous anesthesia should not be used on children under 10 years because it is a respiratory depressant. Anesthesia should be induced slowly, and for not too long duration.—JOHN S. LUNDY. *J. Am. Med. Assoc.*, 110 (1938), 434. (G. S. G.)

Anesthetics and Hypnotics. The ideal local anesthetic is not yet available. Benzamine lactate represents a splendid success as a local anesthetic. It is less toxic than cocaine, but it possesses the unwanted property of causing slight irritation when injected. Epicaine combines in one molecule the essential features of the procaine and adrenaline molecules. Examination of a series of the barbiturates disclosed the remarkable fact that the number of carbon atoms in the groups on C^5 is never less than four or more than eight and that one of these groups, at least, is always aliphatic in character. Outside these limits the compounds formed are either too toxic or inactive.—ANON. *Pharm. J.*, 141 (1938), 467, 577, 674. (W. B. B.)

Anesthetics—Pharmacology of Some New Local. The authors summarize their experiments as follows: Twenty-four local anesthetics have been examined for toxicity and anesthetic potency. Their anesthetic indices relative to procaine have been measured and their anesthetic action in man evaluated. The mode of death in acute experiments in dogs has been investigated and the effect of sodium barbital upon the acute toxicity in dogs has been determined. Some of the compounds have been injected into the portal veins of dogs and the differences in hemodynamic action and the effects upon respiration between this route of injection and the systemic route have been described. The surface anesthetic potency has been determined for rabbit cornea and a surface anesthetic index has been computed. It is concluded that: Five of 24 substances examined have favorable anesthetic-indices, are relatively free from local injury to the tissues when injected in the effective concentrations used, they are rendered less toxic by the prior administration of

sodium barbital and in fatal doses the respiration fails before the circulation. These five substances are worthy of cautious clinical trial. The injection of cocaine, procaine and some of the other local anesthetics described in this paper, into the portal circulation of the dog does not cause discernible changes in blood pressure or respiration until an amount approximating the fatal dose by a systemic vein has been injected. The fall in blood pressure following systemic-vein injection of cocaine, procaine and some of the other local anesthetics described here is approximately the same percentage of the original blood pressure for the same dose per Kg. of animal when either ether or sodium barbital is the anesthetic.—A. R. McINTYRE and R. F. SIEVERS. *J. Pharmacol.*, 63 (1938), 369. (H. B. H.)

Apomorphine—Effect of, on the Movements of the Small Intestine in Unanesthetized Dogs. The subcutaneous and intravenous injections of small amounts of apomorphine in the dog produce a fall in intestinal tone and partial cessation of contractions.—D. SLAUGHTER and E. G. GROSS. *J. Pharmacol.*, 63 (1938), 289. (H. B. H.)

Barbiturates, Thio-Barbiturates and Picrotoxin—Irritability of the Cardiac Vagus Nerves as Influenced by the Intravenous Injections of. The authors summarize their work as follows: (1) All of the barbiturates studied in this investigation (evipal sodium, sodium pentobarbital, ortal sodium and sodium amytal) depressed and cardiac vagus nerves of dogs, cats and monkeys. (2) Pentothal sodium, sodium thio-ethamyl and sodium thio-pentobarbital may increase the responsiveness of the heart to vagus nerve stimulation. (3) In some experimental animals picrotoxin antagonizes the cardiac vagus depressant action of the barbiturates (evipal, pentobarbital and ortal).—CHARLES M. GRUBER, CHARLES M. GRUBER, JR., and NICHOLAS A. COLOSI. *J. Pharmacol.*, 63 (1938), 215. (H. B. H.)

Benzedrine—Psychological Effects of. Benzedrine might be regarded as a derivative of the ephedrine series, *nor*-ephedrine differing from benzedrine in the replacement of a carbon atom in the side chain of benzedrine by a hydroxyl group. In the form in clinical use it was a racemic mixture of *d*- and *l*-phenylisopropylamine, the end carbon atom being asymmetrically combined. It was first introduced for its vasoconstricting effect on the nasal mucosa. It was extremely active in awakening animals from anesthetic sleep—at least as active as coramine but less active than cariazol or picrotoxin. Unlike the latter drugs, however, it did not produce clonic convulsions. It seemed clear that the benzedrine group and the picrotoxin group acted by influencing different parts of the central nervous system, and it was possible that the awakening was brought about by the mediation of nervous stimuli originating for the benzedrine group in the cerebrum, for the ephedrine group no one knew where, and for the picrotoxin group somewhere in the neighborhood of the red nucleus.—ANON. *Pharm. J.*, 141 (1938), 469. (W. B. B.)

3,4-Benzopyrene—Estrogenic Activity of. The estrogenic dose for mice lies between 4 and 31 mg. The results are variable, so is the incidence of tumor formation.—ISABELLA H. PEERY. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 346. (A. E. M.)

Beta-Phenylisopropylamine—Action of, on Basal Metabolism. After injection of beta-phenylisopropylamine the basal metabolism becomes in most cases higher, sometimes lower.—F. LENZI and S. LENZI. *Biochim. terap. sper.*, 25 (1938), 312. (A. C. DeD.)

Carcinogenic Agents—Action of, on Mice Exempt from Mammary Carcinoma. Tar, 1:2:5:6-dibenzanthracene, and radon produced squamous epitheliomas or sarcomas in mice of several strains exempt from spontaneous mammary carcinoma. The carcinogenic agents were incapable of producing glandular cancer in animals not constitutionally predisposed to it. None of the strains of mice now known can be considered completely non-cancerous, since all develop malignant tumors in response to exogenous factors.—N. DOBROVOLSKAIA-ZAWADSKAIA and N. ADAMOVA. *Bull. Assoc. franç. étude cancer*, 27 (1938); through *Brit. Med. J.*, 4055 (1938), 690E. (W. H. H.)

Cholecystokinin and Secretin—Absorption of, from the Colon and Rectum. Secretin may be absorbed to a slight extent from the dog's colon when administered in relatively enormous doses. Cholecystokinin was not absorbed. Cholecystokinin (4500 dog units) when placed in the rectum of man is not absorbed to any significant extent.—H. DOUBILET and A. C. IVY. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 129. (A. E. M.)

Convulsants—Antianesthetic Effects of Some, in the Albino Mouse. A group of commonly used convulsants were tested for antianesthetic properties on unsymmetrical *n*-propyl-*o*-tolyl urea and sodium-ethyl (1-methyl-butyl) barbiturate anesthetized mice, and the statistically treated

results warrant the following deductions: Picrotoxin and metrazol are the most effective antianesthetics, followed closely by benzedrine. Caffeine and ephedrine are of lower potency and strychnine shows no antianesthetic power. Anesthesia affects the toxicities of the antianesthetics variously, from a more than twofold decrease in the M. L. D. of picrotoxin to a fivefold increase in the M. L. D. of benzedrine. Picrotoxin and metrazol appear to be the safest and benzedrine the unsafest of the particularly potent antianesthetics. The authors point out that this observation reflects the potential danger in using benzedrine for this purpose, but since benzedrine is a relatively effective antianesthetic it should be a very useful analeptic and nothing in our tests indicates that it cannot be used with safety for the latter purpose in the absence of anesthesia.—Axel M. Hjort, Edwin J. De Beer and David W. Fassett. *J. Pharmacol.*, 63 (1938), 421. (H. B. H.)

Digitalis—Study of. *Digitalis purpurea* and *D. lanata* are discussed. The following advantages are given for the latter. Constant innocuousness with therapeutic doses; elimination without accumulation; causes no sclerosis of the vascular walls; a high, rapid, intense and cyclic cardiotonic action; produces no pathologic sequel, except digitalism. *D. lanata* may replace the more dangerous and inconstant *D. purpurea* and the even more dangerous strophanthus. It should be preferred to the chemical cardiac tonics: coramine, cycliton, sympatol, etc., and also to sparteine. *D. purpurea* contains active principles which vary with the environment: the Vosges Mountains yield a plant which is five times as active as that grown on the central plateau and ten times as active as that which grows in Normandie or in the suburbs of Paris.—L. Hubert. *Rev. Flora Med.*, 4 (1938), 547; through *J. pharm. Belg.*, 20 (1938), 634. (S. W. G.)

Divinyl Oxide—Effect of, on Intestinal Activity in Vivo. Contrary to the *in vitro* results, all animals showed effects identical to those obtained with ether, namely, diminished muscular tone and complete inhibition of intestinal contraction during all planes of surgical anesthesia.—C. L. Burstein. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 396. (A. E. M.)

Drugs—Effects of, on Coronary Circulation. The effect of epinephrine, acetylcholine, acetyl-beta-methylcholine, nitroglycerine, sodium nitrite, pitressin and histamine upon the coronary circulation of the denervated isolated heart was observed in a series of fifty-seven dogs and sixteen cats. This was done by perfusing the coronary system with blood under constant temperature and pressure in a heart inactivated by producing ventricular fibrillation. The advantages of this method over those previously used are discussed. In the case of the dog it was found that epinephrine, added to the perfusing fluid, uniformly produced a coronary vasodilatation, at times preceded by a transitory vasoconstriction. The dioxane derivative, 933 F., appeared to abolish or decrease this initial vasoconstriction. Ergotamine tartrate and atropine sulfate had no effect upon the epinephrine response; the ergotamine was not given, however, following a vasoconstriction. In the cat, epinephrine produced either vasodilatation or vasoconstriction of the coronary blood vessels, but more often the former. No diphasic response was noted. Ergotamine tartrate had no effect upon the vasodilator response of epinephrine; its action on the vasoconstrictor response was not tested. Atropine was without effect on the epinephrine action. In the dog, the acetylcholine derivatives produced only vasodilatation, but in the cat either vasoconstriction or vasodilatation. While ergotamine tartrate and the dioxane derivative, 933 F., had no effect upon the action of the acetylcholine derivatives, atropine abolished or diminished both the vasoconstrictor response in the cat preparation and the vasodilator response in the cat and dog preparations. The nitrites and histamine, when injected into dog preparations, uniformly produced vasodilatation. Pitressin caused vasoconstriction. From these experiments, indirect evidence was obtained for the belief that in the dog the sympathetic fibers to the coronary blood vessels contain at least vasoconstrictor fibers and the vagi only vasodilator fibers, while in the cat, the vagi appear to contain vasoconstrictor and vasodilator fibers.—L. N. Katz, E. Lindner, W. Weinstein, D. I. Abramson and K. Jochim. *Arch. inter. Pharmacodynamie*, 59 (1938), 399. (W. H. H.)

Ephedrine—Action of. Although it has been reasonably established that the active substance liberated by cholinergic nerves is acetylcholine, the active substance liberated by adrenergic nerves has not yet been identified with certainty. The experiments described represent an attempt to identify the active substance or substances, and provide new examples of the ability of ephedrine to sensitize tissues to adrenaline and show that it may sensitize them to the extent of stimulating adrenergic nerves. Stimulation of the sympathetic nerves in a rabbit's ear, an

improved method for perfusion of which is described, caused vasoconstriction and the liberation of a substance which could be detected colorimetrically with arsenomolybdic acid. Low concentrations of *l*-ephedrine sensitized the rabbit's ear, the cat's nictitating membrane and the frog's heart not only to *l*-adrenaline but also to the stimulation of adrenergic nerves. *l*-Ephedrine increased the yield of the substance liberated by the nerves so that its properties could be studied. It was not *nor*-adrenaline, epinine, corbasil or adrenalone, but might be adrenaline. These actions of ephedrine are attributed to the inhibition of amine oxidase, an effect which is compared with the inhibition of choline esterase by eserine.—J. H. GADDUM and H. KWIATKOWSKI. *J. Physiol.*, 94 (1938), 87; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 156. (F. J. S.)

Ephedrines as Active Agents in the Struggle against Anoxemia. The duration of the resistance of a chloralosed dog to an acute anoxemia (atmosphere containing 2.41% oxygen) can be tripled by an injection of ephedrine, norephedrine or pseudo-norephedrine. This effect is explained by a central action and by a peripheral action of these drugs.—LEON BINET and MOISE STRUMZA. *Compt. rend.*, 207 (1938), 543. (G. W. H.)

Fumaric and Succinic Acids in the Tissues. A method for the simultaneous dosage of fumaric and succinic acids in the tissues is described. This method permits dosage up to 0.1 mg. of fumaric and 0.1 mg. for the sum of the two acids. The found values in the pectoral muscle, cardiac muscle, liver, testicles, cerebral tissue and blood of the pigeon are given.—L. MASSART and G. VAN GREMBERGEN. *Arch. inter. Pharmacodynamie*, 60 (1938), 65. (W. H. H.)

Gelsemium—Biological Assay of. Data are submitted to show that the pigeon emesis method, outlined in a previous paper, is a satisfactory method for measuring the activity of gelsemium. Sensitiveness of pigeons to repeated injections was studied; other biological methods were tried; consideration was given to what principle or principles are responsible for the emetic action. Alkaloids reported in the literature were isolated and tested pharmacologically. A bibliography through 1935 was prepared. Experimental work reported covers tabulation of results of the pigeon emesis assays and discussion of the data, tabulation of results of other assays with discussion details of the investigation of the alkaloids. The following conclusions were reached: Pigeons do not become more sensitive to repeated injections than the limits of experimental error; accuracy is from 5 to 20%; perparations made from drug grown in Florida have emetic doses smaller than other preparations made from the drug on the market; frogs are not a suitable test animal; the 75% M. L. D. for mice and the M. Em. D. for pigeons run somewhat parallel, indicating that pigeon emesis does measure activity; sempervirine and gelsemoidine produce emesis in pigeons but gelsemine and gelsemidine do not, in doses of 20 mg. per Kg. Another worker has reported emesis with gelsemicine. The method is economical, simple, rapid and has a definite end-point.—B. V. CHRISTENSEN and L. G. GRAMLING. *J. Am. Pharm. Assoc.*, 27 (1938), 1208. (Z. M. C.)

Histaminase—Action of, Contained in Extracts of Intestinal Mucous Membrane on Histamine. "Torantil" is a dried extract of the mucous membrane of the small intestine, and it counteracts the contraction of the guinea pig uterus caused by histamine. "Torantil" only inactivates histamine after the incubation of mixtures for twenty-four hours, the optimum p_H being 7 to 8. The histaminase contained in "torantil" appears to have a favorable effect in cases of allergic skin eruptions.—J. FELIX. *Acta Medica Scandinavica*, 95 (1938); through *Brit. Med. J.*, 4053 (1938), 604C. (W. H. H.)

Human Autonomic Pharmacology. Theories and results of autonomic drug administration. Balance between sympathetic and parasympathetic activities may be stated chemically as balance of cholinergic and adrenergic substances. Esterases were added to this concept and were produced by reacting cells or by tissues in general. Four drugs were used in experiment: (1) mecholyl (acetyl-beta-methylcholine chloride) as cholinergic drug; (2) benzedrine sulfate (benzylmethyl carbamine) as adrenergic drug; (3) atropine sulfate to inhibit action of parasympathetics—prevents action of acetylcholine or mecholyl; (4) prostigmin (dimethylcarbamic ester of *m*-oxyphenyl-trimethylammonium methylsulfate) unites with acetylcholine or mecholyl to stabilize it, or with esterases to prevent action on acetylcholine. Therefore, it is a synergist of mecholyl and acetylcholine. Drugs were tested on eye, sweat glands, circulation and gastrointestinal tract. Prostigmine and mecholyl are synergistic and even atropine cannot check effects of the combination. But choline esterase and atropine are synergistic; therefore if epinephrine or benzedrine is added to atropine it will block prostigmine mecholyl combination. Achylia gastrica

is stimulated by action of mecholyl. Heart block can be produced by prostigmine and mecholyl. Spastic condition of colon produced by mecholyl, and atonic colon produced by benzedrine. Prostigmine transforms presbyopic eye into myopic one. Esterases in too great quantity prevent free working of acetylcholine. Hyperactivity of cholinergic type or parasympathetic origin may produce hypœsterasia of heart block.—ABRAHAM MYERSON. *J. Am. Med. Assoc.*, 110 (1938), 101. (G. S. G.)

Hyperspleen—Provocation of a Possible Therapeutic. By means of experimental researches with dogs, the author shows that peri-arterial sympathectomy of the splenic arteries causes an increase in the volume of the spleen due to persistent hyperemia, which, after some time, becomes established in a moderate degree, while an increase is taking place of the reticular endothelial cells. He infers that if the antiblastic action is really due to the spleen as a series of authors have admitted, one can think that peri-arterial sympathectomy can increase this action by causing the described effects in the spleen.—G. PASQUALINO. *Biochim. terap. sper.*, 25 (1938), 327. (A. C. DeD.)

Insulin and Adrenaline—Modifications Caused in the Hypoglycematic and Hyperglycematic Action of, by Addition of Salts of Nickel, Iron or Copper. The hypoglycematic action of insulin-gelatin (1 unit of insulin and 2 cc. of 1% gelatin) and the hyperglycematic action of adrenaline were studied in rabbits when varying quantities of nickel chloride and sulfate, ferric alum and copper sulfate were administered simultaneously. Strong doses diminish and retard the hypoglycematic effects of insulin. With large doses of these salts, there is inhibition of the hyperglycematic action of adrenaline; with moderate doses, there is a sharp reinforcement and retarding of the action.—HENRY SCHWAB. *Compt. rend.*, 207 (1938), 409. (G. W. H.)

Medicaments—Solubilization of, and Therapeutic Action. The effect of the addition of sulfonic and carboxylic groups or of the use of a different type of solvent on the solubility and pharmacological action of drugs is discussed.—A. MOSSINI. *Boll. chim. farm.*, 77 (1938), 251–252; through *Chem. Abstr.*, 33 (1939), 3066. (F. J. S.)

Mercurial Diuretics—Absorption of, as Influenced by Theophylline and Other Substances. The authors showed that theophylline increased the absorption of Mercurin and Salyrgan from the site of intramuscular injection in proportion to the amount present. One mole equivalent produces complete absorption after 55 minutes. Succinimide, uracil, hydantoin, ammonium chloride and glycine were all found to improve the absorption of Mercurin but in decreasing order of effectiveness. It was demonstrated that part of the ability of these "protective agents" to enhance absorption lies in the reduction of the p_H of the solution to more nearly that of blood. The absorption of Mercupurin (Mercurin with theophylline) was found to decrease 22% upon an increase in the p_H from 8.8 to 9.7. There is a possibility of Mercurin and Salyrgan forming slightly ionized compounds with theophylline and perhaps with the other compounds of similar structure. Rabbits were used as the experimental subjects.—ROBERT A. LEHMAN and ARNOLD DATER. *J. Pharmacol.*, 63 (1938), 443. (H. B. H.)

Mercurial Diuretics—Excretion of Mercury Following Administration of, with and without Theophylline. Theophylline was found to influence the urinary excretion of mercury following the injection of Mercurin or Salyrgan in the following ways: (1) The percentage of the administered mercury which is excreted within 6 hours increased 30 to 40% after intravenous injection and 100 to 300% after intramuscular injection. (2) The maximum rates of excretion increased greatly in all cases and by all methods of administration. (3) The maximum excretion rates occurred somewhat earlier. Conclusion: The combination with theophylline modifies the action of mercurials after absorption as well as before.—ARTHUR C. DEGRAFF, ROBERT C. BATTERMAN, ROBERT A. LEHMAN and ELTON YASUNA. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 250. (A. E. M.)

2-Methyl-8-Carboxy-3-Keto-3, 4-Dihydro-1, 4-Benzoxazine—Preparation of. 2-Methyl-8-carboxy-3-keto-3, 4-dihydro-1, 4-benzoxazine, which may be considered as a derivative of salicylic acid, and also as containing the skeleton of acetanilide, was prepared and studied pharmacologically. It showed no antipyretic or analgesic properties.—HAROLD W. COLES and WALTER G. CHRISTIANSEN. *J. Am. Chem. Soc.*, 60 (1938), 1627. (E. B. S.)

β-Methylcholine Urethane—Effect of, on Normal and on Reflexly Inhibited Intestine. The drug causes a marked increase in the tonus and in the amplitude of rhythmic contractions of innervated or of denervated jejunal segments of unmedicated dogs. The drug opposes inhibition of the intestine by reflexly activated sympathetic nerves or inhibition by the sympathin released as

a result of the activity of these nerves. The effect of the drug on intestinal motility is prevented by atropine.—W. B. YOUMANS and R. C. WAISMAN. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 135. (A. E. M.)

Morphine Salts—Comparison of the Results Obtained by the Different Methods Used for Evaluating the Differences in Activity of Various. If the action of morphine salts is studied by their direct application to the frog's nerve, the phenylpropionate is found to act 20 to 30 times as strongly as the hydrochloride, and the latter 5 to 10 times as strongly as the citrate. The order of toxicity of the three salts remains the same if the tests are carried out by intravenous injections in rabbits and observation of the rate of development of anesthesia. But by measurement of the depression of the oculo-palpebral reflex (a phenomenon which can last 4 or 5 hours) it is the citrate which acts most strongly, followed by the hydrochloride. Hypodermic injection into mice, to determine average lethal dose by Kärber and Behrens' method, requiring observations for 24 hours, shows that the citrate is 1.6 times as toxic as the hydrochloride, and the latter 1.25 times as toxic as the phenylpropionate. These differences are explained by the rate of fixation of the salts by the cell and by their rate of elimination. Short tests bring out especially the action of rapidly penetrating salts.—J. REGNIER and SUZANNE LAMBIN. *Compt. rend. soc. biol.*, 127 (1938), 116–118; through *Chimie & Industrie*, 40 (1938), 306. (A. P.-C.)

Pancreatic Secretion—Effect of Various Substances on. A patient presenting a pancreatic fistula came under observation and the authors made exact measurements of the effects of drugs and other substances upon his pancreatic secretion. Protein-free secretin caused an increase in the total flow of pancreatic juice as well as an increase in the total base contained therein. Other substances causing increased flow were water (orally), olive oil, 50% glucose solution (stomach tube), 0.5% hydrochloric acid, coffee, 10% peptone and beef broth. Sodium bicarbonate caused no change in the flow, though the total base increased. A mixed meal scarcely affected the amount or character of the flow, nor did 15% magnesium sulfate. Bile salts, atropine, pilocarpine and epinephrine caused a diminution in flow. Mecholyl had the most pronounced stimulatory effect of any drug. Physostigmine caused a gradual increase in secretion, while pilocarpine caused a slight decrease in flow.—J. M. MCCAUGHAN, B. L. SINNER and C. J. SULLIVAN. *Ann. Int. Med.*, 61 (1938), 739; through *Abbott Abstract Service* (1938), No. 330. (F. J. S.)

Physostigmine and Strychnine—Synergism of. Physostigmine and strychnine administered to normal rats exerted a hyperglucemic synergy. The maximal hyperglucemia of strychnine was increased by 330% and the sum of the means of both alkaloids was increased 47%. The quantities of drugs as employed did not produce any objectionable systemic symptoms. The drugs lost the effect after demedullation of the adrenals.—BEN K. HARNED and VERSA V. COLE. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 372. (A. E. M.)

Renal Pressor Substance—Preparation of Extracts of. Fresh kidney cortex was finely ground with carborundum. Nine cc. of 95% alcohol was added per Gm. of paste and the mixture was kept at 10° for 24 hours. The solid matter was centrifuged off, washed with ether and dried. The powder was extracted with 0.5% solution of sodium bicarbonate at 40 to 45°, using one cc. per Gm. of substance. The extraction was repeated and the fluids combined. The extract could be purified further by precipitation with alcohol. It produced a strong pressor effect in experimental animals.—EDWARD B. GROSSMAN. *Proc. Soc. Exptl. Biol. Med.*, 39 (1938), 40. (A. E. M.)

Riboflavin—Phosphorylation of, by Intestinal Mucous Membrane Extract and the Action of Iodoacetic Acid on. Riboflavin was dissolved in phosphate buffer of p_H 6.8, the intestinal extract carefully added and the mixture incubated for 20 hours with frequent shaking. Sterility and protection from light are important. The mixture was then boiled for 5 minutes, centrifuged and filtered through a Berkefeld filter. The phosphorylation was detected by cataphoresis, the anode side producing an intensive green fluorescence. Not only the duodenum, but also the jejunum and ileum of the swine intestines and likewise dried powders from cats and rats were active. Monoiodoacetic acid hinders this phosphorylation *in vitro*. The mucous membrane of the small intestines of animals poisoned by iodoacetic acid had the capacity to retain phosphorylation.—H. HÜBNER and F. VERZAR. *Helv. Chim. Acta*, 21 (1938), 1006. (G. W. H.)