PHARMACEUTICAL ABSTRACTS

EDITOR: A. G. DUMEZ, 32 S. Greene Street, Baltimore, Maryland.

ABSTRACTORS

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The following abstracts, prepared from articles of pharmaceutical interest appearing in pharmaceutical and other scientific or professional periodicals, are intended to replace the abstracts heretofore published in the annual report of the Reporter on the Progress of Pharmacy and carried in the YEAR BOOK. This work is a new venture on the part of the ASSOCIATION and is still in the formative period. We do not as yet receive all of the journals that we desire to abstract, nor do we have a full staff of abstractors. We expect, however, to make up these deficiencies as time goes on to the end that all periodicals of pharmaceutical importance may be brought within the scope of this work.

The pages carrying these abstracts are numbered beginning with 1, the purpose being to permit those who desire to do so to bind them with the ASSOCIATION data and membership rolls which will be printed later, and thus continue the present series of YEAR BOOKS.

A. G. DUMEZ.

March 12, 1935.

BACTERIOLOGY

Bacteria—Growth of, in Organic Acid Media. The author, using *B. pyocyaneus, B. Aertrycke, B. paratyphosus B* and *B. bronchosepticus*, finds with the acids used that in general unsubstituted organic acids of odd numbers of carbon atoms do not support bacterial growth and those of even numbers do; while the hydroxy and amino acids of even numbers of carbon atoms do not support bacterial growth and those of odd numbers do.—W. F. BRUCE. *J. Am. Chem. Soc.*, 57 (1935), 382. (E. B. S.)

Cholera—Treatment of, with New Anti-cholera Serum. A toxin prepared from an 18-hour broth culture by filtration, was injected into horses in doses up to 500 cc. The purified concentrated serum obtained after the immunization process had a titer of 1 in 12,000 of H agglutinin and 1 in 1600 of O agglutinin. Intraperitoneal administration was found to be more effective than subcutaneous or intravenous injection. The latter part of the experiments was carried out using 30–40 cc. of serum diluted with 200 cc. of saline, injections being made intraperitoneally. The following results were obtained: In 211 control cases and 128 cases treated with serum the per cent of deaths was 34.1 and 20.2, respectively. With 57 control cases and 32 cases treated with 30–40 cc. of serum the deaths were 26.3 per cent and 12.5 per cent, respectively. The work will be continued.—H. GHOSH. *Brit. Med. J.*, 1 (1935), 56. (S. W. G.)

Disinfectants—Laboratory Testing of. The conditions governing disinfectant action include the concentration of the disinfectant, the time of application, the temperature, the number of bacteria, the nature of bacteria and the presence of other materials with which the disinfectant may act. In the Chick-Martin test the author recommends the use of a suspension of yeast to supply the organic matter necessary. The author suggests that the different types of surgical disinfectants may be classified in groups, and each group should have its particular standard. Determination of the toxicity of disinfectants may be made by subcutaneous, oral or intravenous routes. The author suggests that the route should be standardized.—L. P. GARROD. *Brit. Med. J.*, 1 (1935), 5. (S. W. G.)

Disinfecting Agent—Hints for Use of. The article includes a table of some chemical disinfectants and the strengths in which they should be used for certain purposes. Some other disinfectants are also discussed as to their effectiveness and use. The use of metal tanks of a type illustrated in the article is suggested for the disinfection with an inflammable material of rooms which cannot be completely closed. Disinfection after cases of certain special diseases is then taken up.—THOMANN. *Schweiz. Apoth.-Ztg.*, 73 (1935), 54. (M. F. W. D.)

Gonococcus Filtrate (Corbus-Ferry)—Experience with in Treatment of Gonorrhea. Evidence based on the use of Gonococcus Filtrate (Corbus-Ferry) intradermally in 124 cases of gonorrhea shows this antigen to be of definite value both in the diagnosis and treatment of this disease. Impressively satisfactory results were obtained with the antigen alone and also when used in conjunction with the usual therapy.—R. E. CUMMING and R. A. BURHANS. *J. Am. Med. Assoc.*, 104 (1935), 181. (M. R. T.)

Pneumococci—Use of Sodium Desoxycholate for Identification of. Two drops of a 10% water solution of sodium desoxycholate are added to 1 cc. of pneumococcus culture. The culture becomes perfectly clear in from 2 to 5 minutes. The p_H of the culture to be tested must not be below 6.5 or the desoxycholate will precipitate. The test is carried out at a temperature below 50° C. The author states that he has never found any streptococci which would dissolve, or any pneumococci which failed to dissolve, in the sodium desoxycholate solution.— E. LEIFSON. *J. Am. Med. Assoc.*, 104 (1935), 213. (M. R. T.)

Pneumococcus—Oral Immunization of Human Beings against. A report on antibody formation following the oral administration of pneumococcus vaccines. Original reference given.—V. ROSS. *Clin. Med. & Surg.*, 42 (1935), 92. (B. S. R.)

BOTANY

Rhubarbs—Investigations on Cultivated. The rhizomes of *Rheum officinale* and of *R. palmatum*, cultivated for 2 years at Pavia, contain 1 per cent of anthraquinone derivatives, which is appreciably lower than is found in rhizomes of Asiatic origin. It has been observed that the roots are higher in anthraquinone derivatives than the rhizomes. Cultivation of the most highly prized rhubarbs does not, therefore, seem to produce in the rhizomes the chemical characteristics inherent to those of Asiatic rhubarbs, to which are generally attributed the therapeutic activity

of rhubarb, and hence the preference shown in the pharmacopœia for the Asiatic product is justified.—P. MARANGONI. *Scienza farm.*, 2 (1934), 13; *Chimie et industrie*, 32, 1934, 634; through *Chem. Abstracts*, 29 (1935), 888.

CHEMISTRY

General and Physical

Centrifugal Force—Nomogram for. In designating results involving the use of a centrifugal machine, the force as compared with gravity (relative centrifugal force) should be specified rather than the number of revolutions per minute, which affords but slight notion of the centrifugal stress to which the material has been subjected. Centrifugal force, C (in dynes), is given by the relation $C = 4\pi^2n^2r$, where n is the number of revolutions per second and r is the radius in centimeters. C is divided by 980 to obtain the relative centrifugal force, compared with gravity. For ready calculation of centrifugal force, a convenient nomogram is given.—H. SHAPIRO. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 25. (E. G. V.)

Glycol-Water Mixtures—Relation of Vapor Pressure and Boiling Point to the Composition of. The glycol-water system was investigated from 0 to 100 per cent glycol and up to atmospheric pressure. The boiling point-pressure relations are given in the form of the Young equation. The mixtures obey Raoult's law fairly closely.—H. M. TRIMBLE and W. POTTS. *Ind. Eng. Chem.*, 27 (1935), 66. (E. G. V.)

Inorganic

Hydrogen—Heavy. A brief review of heavy hydrogen and a comparison of some of its properties with properties of ordinary hydrogen.—E. B. LUDLAM. *Pharm. J.*, 134 (1935), 88. (W. B. B.)

Magnesium Perchlorate ("Anhydrone")—Value of, as Drying Agent. Anhydrous magnesium perchlorate, which may be prepared by heating the hydrated forms to 200–250° C. for a few hours, has been found to be as good as phosphorus pentoxide as a drying agent and for absorbing water. The perchlorate is easier to handle than phosphorus pentoxide and may be recovered by heating.—J. G. F. DRUCE. *J. Soc. Chem. Ind.*, 54 (1935), 54. (S. W. G.)

Organic

Alkaloids

Morphine Series—Reduction Studies in. V. Dihydro- and Tetrahydro-Pseudocodeine Methyl Ethers. A suspension of 5 Gm. of pseudocodeine methyl ether hydrochloride in 50 cc. of glacial acetic acid, when hydrogenated in the presence of platinum oxide gave 3.7 Gm. of dihydropseudocodeine-A-methyl ether, and 0.7 Gm. of the tetrahydro compound. The alcoholic methoxy group was not eliminated. When pseudocodeine methyl ether was reduced with sodium in absolute alcohol, dihydropseudocodeine-C-methyl ether resulted. The methiodide of dihydrospeudocodeine-A-methyl ether, when degraded with 25 per cent sodium hydroxide gave dihydro-ε-methylmorphimethine-A-methyl ether, which on hydrogenation in 7.5 per cent acetic acid with platinum oxide, gave the tetrahydro compound. The methiodide of dihydropseudocodeine-C-methyl ether, when treated with the calculated amount of thallous hydroxide, yielded dihydro-ε-methylmorphimethine-C-methyl ether, which on hydrogenation in 10 per cent acetic acid with platinum oxide yielded the hexahydro-ε-methylmorphimethine methyl ether. Analysis and physical properties of the compounds and certain of their derivatives are given.—L. SMALL and R. E. LUTZ. *J. Am. Chem. Soc.*, 57 (1935), 361. (E. B. S.)

Morphine Series—Reduction Studies in. VI. Hydrogenation of Alpha- and Beta-Isomorphines. Alpha-isomorphine was hydrogenated in alcohol with palladium-barium sulphate to dihydro-α-isomorphine, and this product on methylation with diazomethane gave dihydroisocodeine. The compound and certain derivatives were analyzed and identified. Beta-isomorphine on hydrogenation in ethanol, using platinum oxide catalyst yielded tetrahydro-β-isomorphine, and when hydrogenated in acetic or hydrochloric acid, yielded a mixture of the dihydro- and tetrahydro-bases. These on methylation yielded dihydro- and tetrahydroallopseudocodeine, respectively.—L. SMALL and B. F. FARIS. *J. Am. Chem. Soc.*, 57 (1935), 364. (E. B. S.)

Essential Oils and Related Products

Achillea Millefolium Linné—Volatile Oil of. The following constants were obtained on some oil obtained by steam distillation from a crop grown at the Pharmaceutical Experiment station at the University of Wisconsin. All figures are at 25° C. Specific gravity, 0.9066; Refractive Index, 1.4703; Specific Rotation, $[\alpha]_D = -14.11$.—R. L. McMURRAY. *Am. J. Pharm.*, 107 (1935), 33. (R. R. F.)

"Cedro" Wood Oil—Brazilian. "Cedro" are trees belonging to the N. O. Meliaceæ, genus Cedrala; the most common species being *C. odorata* L., *C. angustifolia* D. C., *C. montana* Karst., *C. macrocarpa* Ducke, *C. fissilis* Vell., *C. australis* Juss., St. Hil., *C. glaziovii* D. C.; their frequency in the virgin forests corresponds to the order in which their scientific names are given here. Roots, chips, sawdust, leaves and the fruit capsules are used in the extraction of essential oil; the yield covers a wide range, according to the soil conditions, the age and the state of health of the individuals, and to the part of the tree explored. Only old and very strong individuals deliver the extractable material. Results obtained when different lots of raw material were subjected to steam distillation in small vessels under laboratory exactness are tabulated. The essential oil from any one of the mentioned Cedro species is very frequently employed as a specific remedy against psoriasis and erysipelas; also herpetic affections are stated to retrocede after an extended external medication. For the application, the oil is incorporated into some animal fat. The writer and his assistants have experienced erythematous phenomena on their own skins after handling essential oils of any of the mentioned species. Other applications of the oil are also given.—F. W. FREISE. *Perf. and Ess. Oil Rec.*, 26 (1935), 11. (A. C. DeD.)

Peppermint Oil—Report on, from Cyprus. The characteristics of oils distilled from the "black" and the "white" varieties of peppermint were: $d_{15.6}^{15.6}$ 0.9137–0.9299, 0.9182–0.9228; $[\alpha]_D^{18}$ −20.75°, −10.84° to −30.3°; n_D^{20} 1.4630–1.4634, 1.4642–1.4660; acid value 0.8–7.6, 0.5–1.2; ester value 25.9–68.2, 29.8–83.1 (equivalent to menthyl acetate 9.2–24.1, 10.5–29.4 per cent); and ester value after acetylation 200.1–228.4, 169.8–202.6 (equivalent to menthol 65.6–76.8, 54.2–66.6 per cent), respectively. The oil from the "black" variety was soluble in 2.7–3.0 volumes of 70 per cent alcohol at 15.5°; that from the "white" variety was insoluble in 13 volumes of 70 per cent alcohol, but was soluble in 1.2 volumes of 80 per cent alcohol at 15.5°.—*Cyprus Agr. J.*, 27 (1932), 56; 28 (1933), 39; through *Chem. Abstracts*, 29 (1935), 292.

Terpenes—Biogenesis of Some. The manner in which certain changes in terpene molecules and precursors of terpenes may occur is postulated. Structural formulas are given.—J. WALKER. *J. Soc. Chem. Ind.*, 54 (1935), 55. (S. W. G.)

Turpentine—Chios. The history of the drug is traced to earliest writings. A botanical description of the drug is given in full with habitat, etc., along with characteristics of the fruit and resin and uses of the plant. A survey of the literature in regard to the chemical constitution is included. A detailed study of the resin is undertaken. The resin was treated with ether, 7.83 per cent being insoluble, the ether solution was then shaken out with 1 per cent solution of ammonium carbonate and the terminth acid separated with acid and studied. A second treatment of the ether extract with another alkali solution and then acid removed two acids which were soluble in alcohol. This solution on treatment with alcoholic solution of lead acetate gave an alcohol insoluble lead salt of terminthin acid and an alcohol-soluble lead salt of terminthol acid each of which was studied. The ethereal extract on further treatment with alkali and acid yielded terminthol in acid. The ethereal extract was distilled, the volatile oil was then steam distilled, salted out, the ether distilled off and the oil studied. On steam distillation of the oil a resin remained behind. A bitter principle was also separated. On dry distillation of the resin, water, a volatile oil and several empyreumatic products were obtained.—E. EMMANUEL. *Pharm. Acta Helv.*, 10 (1935), 12. (M. F. W. D.)

Fixed Oils, Fats and Waxes

Croton Resin—III. Combined Acids. The resin was saponified with 1.6 *N* alcoholic potassium hydroxide in an atmosphere of nitrogen. Thirty-two per cent of the saponification products were petroleum ether-soluble fatty acids. The acids identified were taglic, caprylic, capric, lauric, myristic, palmitic, oleic and linoleic.—N. L. DRAKE and J. R. SPIES. *J. Am. Chem. Soc.*, 57 (1935), 184. (E. B. S.)

Halibut Liver Oil. Factors affecting the production of this oil are (1) origin of the fish geographically and (2) the process of extraction and refinement. It appears as if the viscosity of the oil is related to the amount of vitamin A present as those with high concentrations are very viscous. In order to meet prevailing specifications of free fatty acids (max. 1.41%), it is necessary to neutralize and remove these acids, which treatment causes considerable variation in the constants for the oil. The potency of the oil depends on (1) the age of the fish, (2) the season of the year, and (3) the spawning cycle and food (probably) and ranges from 30,000 International Units per Gm. vitamin A to 160,000–175,000; vitamin content is generally 2000–3000 units per 100,000 units of A. Most of the oil is more potent than the standard now observed and that from the Pacific Coast is twice the 44,800 new U. S. P. Units now recognized. Preferable diluents appear to be corn germ, wheat germ and cottonseed oil and it may be fortified by the addition of viosterol or natural Vitamin D and the addition of other potent oils as swordfish liver oil and tuna oil. Combinations of the oil with other medicaments are mentioned.—H. F. TAYLOR. *Drug and Cosmetic Ind.*, 35 (1934), 603, 685; 36 (1935), 149. (H. M. B.)

Olive Oil—Occurrence of Unsaturated Hydrocarbon in. The authors of this paper have made a thorough study of an unsaponifiable fraction contained in olive oil, using an authentic product of Palestine origin. They prepared their material by saponifying the oil in the usual manner; extracting the unsaponifiable portion with ether; purifying it in two ways, fractional crystallization from hot ethyl alcohol and selective adsorption. The latter method was the most satisfactory. The unsaponifiable matter was dissolved in a mixture of 90% petroleum spirit and 10% benzene and passed through a column of Merck's specially purified aluminum trioxide. Four colored zones appeared and these were separated and, with the filtrate passing through, examined separately. A spectroscopic examination showed clearly the presence of ergosterol in some of the adsorption bands. The filtrate contained a colorless and odorless mobile oil from which there separated on chilling a small amount of crystalline wax having no iodine absorption value. Analysis of the liquid portion showed it to be unsaturated and of the squalene type containing traces of other things, some of them containing oxygen. Distillation under reduced pressure resulted in a more highly purified fraction. Elementary analysis was made of this purified fraction and the results indicated very clearly that the fraction was almost pure squalene. Both the hydrochloride and the hydrobromide prepared from it, when compared with the derivatives from pure squalene showed very close microscopic resemblances. It was further found that the hydrochloride of squalene could be prepared directly from the oil but the yield was not very good. Other samples of olive oil were examined and also one of tea seed oil. The olive oils all contained the hydrocarbon but the tea seed oil did not. A table comparing various constants of pure squalene and those of the hydrocarbon of the olive oil is given and close agreement is shown in practically every respect.—T. THORBJARNARSON and J. C. DRUMMOND. *Analyst*, 60 (1935), 23. (A. H. C.)

Glycosides, Ferments and Carbohydrates

Chondrus Crispus—Some Properties of Polysaccharide Complex from. A method is described which yields a standard, relatively pure material, largely carbohydrate in nature, with an ash content of approximately 20 per cent of its dry weight, representing the gelatinizing constituent of *Chondrus Crispus*. An extract previously described as an ethereal sulphate of calcium is now shown to be a mixture of sulphates, phosphates, etc. Potassium, ammonium and calcium salts of the ethereal sulphates occurring *in situ* have been prepared and examined. More than the theoretical quantity, as calculated on Hass' formula, was lost by ashing the standard extract. A modified formula embodying an acid salt is given. Comparison of the chondrus extract with purified agar-agar showed a similarity in physical properties and origin.—M. R. BUTLER. *Biochem. J.*, 28 (1934), 759; through *Physiol. Abstracts*, 19 (1935), 566.

Pectins—Survey of Recent Researches on. Since pectins have won a considerable place in food industries in recent years and since they have been suggested for certain types of medicaments the author has compiled this review. While it is based primarily on the work of Ehrlich and his co-workers during the past seventeen years it covers the history of the subject to a considerable extent. Structural formulas are given and the chemical discussion is rather complete. The review also enumerates several commercial uses for pectins.—E. I. VAN ITALLIE. *Pharm. Weekblad*, 72 (1935), 2, 25. (E. H. W.)

Saponins.—A discussion of the history, properties, distribution in the plant kingdom and in parts of plants, and the function of saponins in plants is given. Chemical properties of saponins and their purification are taken up, as well as a study of their constitution in so far as possible. Consideration is given to means of quantitative estimation of saponins by (1) determination of the amount of froth, (2) the so-called hemolytic index, and (3) toxicity toward fish. All saponin containing drugs are classified into four groups according to their uses: (1) purgative and expectorant drugs, (2) blood purifiers, (3) diuretics, (4) nutrient saponin containing drugs. A few of the uses of saponins in pharmacy and medicine are listed.—K. LEUPIN. *Pharm. Acta Helv.*, 10 (1935), 22. (M. F. W. D.)

Other Plant Principles

Pterocarpin—Identification of Constituents of Red Sandalwood. According to elementary analysis, the formula for pterocarpin may be either $C_{14}H_{12}O_4$ (proposed by Rast) or $C_{17}H_{14}O_5$. The analysis for the bromine content of monobrompterocarpin corresponds to the formula $C_{17}H_{14}O_5Br$, thus verifying $C_{17}H_{14}O_5$. The monobrom derivative was obtained in the form of colorless needles, melting at 165°. It is suggested that pterocarpin differs from homopterocarpin ($C_{17}H_{16}O_4$) in that it contains a methylene oxide group instead of two methoxyl groups. Pterocarpin gives a positive test for the methylene oxide group by the reaction of Labat, Pictet and Kramers and also the color test of Weber and Tollens. Free hydroxyl groups are not present, since pterocarpin is neither soluble in sodium hydroxide solution nor is it acetylizable. It condenses with difficulty with 2,4-dinitrophenylhydrazine to form dark reddish brown, glistening needles having the formula $C_{23}H_{18}O_8N_4$, m. p. 305°. Pterocarpin contains, in addition to a carbonyl group, an oxygen atom bound in an ether-like linkage since reduction results in the formation of phenolic hydroxyl. Fusion with caustic potash converts pterocarpin to resorcin.—H. LEONHARDT and K. FAY. *Arch. Pharm.*, 273 (1935), 53. (L. L. M.)

Unclassified

5,5-Alkylphenylbarbituric Acids—Synthesis of. The following 5,5-alkylphenylbarbituric acids were synthesized, *viz.*, the ethyl, isopropyl, isoamyl, *n*-hexyl and *n*-heptyl phenylbarbituric acids. The method was as follows: Phenylacetonitrile was condensed with diethylcarbonate, using sodamide as the condensing agent in absolutely anhydrous ether and with efficient stirring and refluxing and yielding ethyl cyanophenylacetate. The cyanophenylacetate is alkylated and the resulting cyanoalkylphenylacetate is condensed with urea in ether, alcohol or absolute alcohol in the presence of sodamide or sodium ethylate. The resulting 5,5-alkylphenyl-4-iminobarbituric acid is hydrolyzed in 3.3*N* hydrochloric acid to the 5,5-alkylphenylbarbituric acid. Yield 19.2%. The acids other than luminal are synthesized for the first time by this method, and their physical constants and the physical constants of the intermediate products are given. The pharmacological evaluation has not been given.—J. S. CHAMBERLAIN, J. J. CHAP, J. E. DOYLE and L. B. SPAULDING. *J. Am. Chem. Soc.*, 57 (1935), 352. (E. B. S.)

Aurothiosulphates of Quinine, Ammonium and Calcium—Preparation and Properties of. Quinine aurothiosulphate is prepared by using a concentrated solution of quinine hydrochloride with sodium aurothiosulphate, and constantly stirring. A white precipitate forms, which turns pale yellow. After washing and drying, amorphous pale yellow masses appear with some crystals. The compound is soluble in water at 9° C. to the extent of 0.46 Gm. per liter, and at 100° C.—24.3 Gm. per liter. It is insoluble in organic solvents, stable in air and at 150° C. decomposes slightly. Ammonium aurothiosulphate is obtained by displacing quinine from its aurothiosulphate by ammonium, by treatment with excess ammonium hydroxide. It is a white amorphous solid, very soluble in water, but insoluble in organic solvents and decomposes very easily. Calcium aurothiosulphate is prepared by treatment of calcium hyposulphite and gold chloride. The calcium compound is dissolved out with alcohol, and when purified it is colorless. The compound after twenty-four hours contained ten molecules of water, but after four months contained six molecules of water. It is very soluble in water, insoluble in organic solvents and very hygroscopic. Heating to 100° C. does not change it, but at 250° C. decomposition takes place. *Chemical properties.*—They dissolve in dilute acids. Diluted hydrochloric acid causes formation of a sulphate. Diluted sulphuric acid causes formation of colloidal gold. Diluted nitric acid forms sulphur precipitate and sulphurous acid. Other tests and reactions prove Fordos and Gelis' hy-

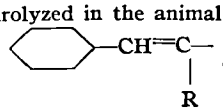
pothesis that gold is monovalent in the compound. Reactions with hydroquinone pyrogallol, potassium permanganate and tannin result in the formation of metallic gold. Reactions with reducing agents were also given.—M. M. PICON. *J. pharm. et chim.*, 21 (1935), 101. (M. M. Z.)

Isobutyl Groups—Introduction of, into Phenols, Cresols and Homologous Compounds. The isobutyl derivatives were made by the rearrangement of the methylallyl phenol ether to the corresponding methylallyl phenol, and the catalytic reduction to the isobutyl phenol. Tests showed the isobutyl radical did not enhance the germicidal action of the phenols to as great an extent as did the normal butyl and higher alkyl radicals.—Q. R. BARTZ, R. F. MILLER and R. ADAMS. *J. Am. Chem. Soc.*, 57 (1935), 371. (E. B. S.)

Phenols—Molecular Compounds of. A series of molecular compounds formed by cineole and *m*-5-xylidine with different phenols is given. The molecular proportions and melting points are tabulated.—G. T. MORGAN and A. E. J. PETTET. *J. Soc. Chem. Ind.*, 54 (1935), 22T. (S. W. G.)

Tartrates and Racemates. The various crystal forms of tartrates and racemates are reviewed and illustrated. A structural formula is given to explain the unusual behavior of some of the compounds.—T. M. LOWRY. *J. Soc. Chem. Ind.*, 54 (1935), 28. (S. W. G.)

Tetrahydronaphthalene Peroxide—Preparation of. Satisfactory yields of this article by the oxidation of tetrahydronaphthalene (tetralin) are obtained only by aspirating air through the tetralin for a period of about 45 hours. It was found that the best solvent for the recrystallization of tetralin peroxide was a mixture of 22 cc., ethyl acetate and 70 cc. of petroleum ether for each 70 Gm. of the peroxide. The product recrystallized three times from this solvent mixture melted at 56° C.—W. NUSSLE, JR., G. W. PERKINS and G. TOENNIES. *Am. J. Pharm.*, 107 (1935), 29. (R. R. F.)

Urethanes—Study of a New Series of. Report is made of a study of two urethanes, 2-methyl cinnamyl urethane and 2-amyl cinnamyl urethane. Details of experimental work are given. Both were found to be inactive as hypnotics. Since urethanes in general are not rapidly hydrolyzed in the animal organism the conclusion was that there was no hypnotic activity in the  grouping or that the urethanes are not readily absorbed, probably the latter since the corresponding amides are active.—W. A. LOTT and W. G. CHRISTIANSEN. *J. Am. Pharm. Assoc.*, 24 (1935), 22. (Z. M. C.)

BIOCHEMISTRY

Enzyme Activity—Effect of Certain Salts on. The toxicity of sodium salts of selenium, vanadium, arsenic and tellurium toward the production of carbon dioxide during yeast fermentation of glucose is in the order named. Sulphur shows some acceleration, depending on the form used, and probably is in direct correlation with the hydrogen sulphide concentration. The toxicity of the sodium salts of selenite, selenide and selenate decreases in the order named. An accelerating effect is shown by sodium sulphide and, to a lesser degree, by sulphite. The sulphate shows a slight retarding effect. Sodium sulphide counteracts the toxic effects of selenium considerably. Elemental sulphur has no accelerating effect and only slightly counteracts the toxic effects of selenium even in the ratio of 20 to 1. Sodium sulphide, ammonium sulphate and sodium thiosulphate are also unable to counteract the toxic effect of selenium.—A. L. MOXON and K. W. FRANKE. *Ind. Eng. Chem.*, 27 (1935), 77. (E. G. V.)

Gonadotrophic and Estrogenic Principles—Occurence of, in Myoma of Uterus. Assay of a human uterine fibroid showed the tissue to contain $4^1/_2$ rat units of follicle-stimulating and luteinizing factors per Gm. of desiccated tissue. The extract gave both effects. The estrogenic assay of this material revealed 4 units per Gm. of tissue or 1800 units per pound. The history of the patient from whom the fibroid was removed is given.—D. LEWIS and C. F. GESCHICKTER. *J. Am. Med. Assoc.*, 104 (1935), 45. (M. R. T.)

Male Sex Hormone—Extraction of, from Urine. Urine is acidified with hydrochloric acid, heated to 80° C. for 5 hours, cooled, mixed with milk of lime, and filtered. The filtrate is treated with soda ash and filtered. The filtrate is extracted with benzene in a continuous extraction apparatus, of which a diagram is given. Benzene extracts fewer impurities than chloro-

form.—Y. WANG and H. WU. *Chin. J. Physiol.*, 8 (1934), 209; through *Physiol. Abstracts*, 19 (1935), 672.

Oestrin and Luteohormone. A review of the methods of assay, the isolation method and the structural chemistry of oestrin and the lutean hormone.—K. PEDERSEN-BJERGAARD and B. KONSTANTIN-HANSEN. *Dansk Tids. Farm.*, 9 (1935), 29. (C. S. L.)

Vitamin C in Bulk. References are made to the method of Szent-Györgyi for preparing pure vitamin C in large quantities from certain peppers of the genus capsicum, to the possibility of a test for latent scurvy or prescurvy by estimation of the vitamin C content of the urine, and to the synthesis of l-ascorbic acid or active vitamin C. The vitamin C excreted by the urine varies according to the vitamin C reserves or "saturation" of the person tested.—*Lancet*, 1 (1935), 100. (B. S. R.)

ANALYTICAL

Aconitine—Detection of, in Aconite Root. A tentative method was adopted. The sample is macerated with water and extracted with ether in the presence of ammonium hydroxide. The washed ether layer is extracted with 0.02*N* sulphuric acid until acid to methyl red. The acid aqueous layer is treated with 5% sodium carbonate solution, heated to 60°, cooled and examined for crystals.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 84. (G. S. W.)

Aldehydes and Ketones—Improved Hydroxylamine Method for Determination of Displacement of Oxime Equilibria by Means of Pyridine. A 0.5 *N* solution of hydroxylamine is prepared by dissolving 35 Gm. of hydroxylamine hydrochloride in 160 cc. of distilled water and diluting to one liter with 95 per cent ethanol. A solution of 20 cc. of pyridine and 0.25 cc. of 4 per cent alcoholic bromphenol blue indicator is made up to 1 liter with 95 per cent ethanol. A standardized 0.5 *N* sodium hydroxide solution in methanol is used for acidimetry. Thirty cc. of hydroxylamine hydrochloride reagent and 100 cc. of the pyridine-bromphenol blue solution are run into a 300-cc. citrate of magnesia bottle. The weighed or measured sample (never equivalent to more than $^2/_3$ of the reagent) is added. The bottle is capped and allowed to stand at room temperature or heated in a steam-bath. The time necessary depends upon the aldehyde or ketone and a table of optimum times is given for about 30 compounds. In most cases two hours' heating is sufficient. A blank for use as a color standard is run for each set of determinations. The pyridine hydrochloride in the reaction mixture is then titrated until the indicator color matches the blank. Precautions to be used are given and the effects of groups adjacent to the carbonyl group are discussed. Results were within plus or minus 1 per cent of the theoretical.—W. M. D. BRYANT and D. M. SMITH. *J. Am. Chem. Soc.*, 57 (1935), 57. (E. B. S.)

Amidopyrine and Dinitrophenol (2,4)—Detection of. Tentative microchemical methods were adopted. Crystals are obtained from a water solution of amidopyrine by the addition of either mercuric chloride (5 Gm. in 100 cc. of water) or Marme's solution (3 Gm. of cadmium iodide in 18 cc. of water containing 6 Gm. of potassium iodide). A solution of dinitrophenol in sodium hydroxide (0.1*N*), acidified with 1% hydrochloric acid produces characteristic crystals. Comparisons are made against controls. Descriptions of the crystals are given.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 86. (G. S. W.)

Anesthetics—Special Detection of Cocaine and Novocaine, with Reference to Smuggled Goods. The Zwikker reagent for Cardiazol (*Pharm. Weekblad*, Oct. 20, 1934), cuprous chloride (CuCl) has been adapted as a microchemical reagent giving the following reactions with anesthetics: with Acoine—no reaction; with Allylcocaine nitrate—a compact mass of yellow rosettes of needles; with Alypine—yellow parallelograms which disappear rapidly; with Anesthesin hydrochloride—large yellow plates, sometimes branching; with Butelline—a yellow undifferentiated mass; with Cocaine hydrochloride—lemon-yellow fine feathery rosettes beginning thread-like but increasing in thickness; Cycloform—green fine rosettes of needles; Diocaine—no reaction; Eucaine A—light yellow rosettes with outward pencil-like branching forms; Eucaine B—no particular reaction; Holocaine—no reaction; Larocaine—a clear yellow liquefying mass; Novocaine—yellow very small thin needles sometimes grouped in crosses, but yet so soluble that a good result is only obtained by placing the preparation in a desiccator. Differention from cocaine hydrochloride is obvious. This is one of the reactions in which cocaine hydrochloride reacts quickly and satisfactorily while novocaine gives as good as no reaction. Nycaine—beautiful emerald-green, three-sided columns with oblique ends. The most beautiful reaction with this

reagent. Orthoform—several variable forms, long needles (possibly the reagent) light yellowish green columns and four-sided crystals of the sulphite; Orthoform New—gray-green needles usually in large rosettes; Pantocaine—a hygroscopic yellowish mass in which no characteristic forms appear; Percaine—lemon-yellow rosettes, not characteristic; Propaesine—many crystals but none which can be described as characteristic: Psicaine—bluish gray plates mostly four-sided. The only material which gives this color. Psicaine New hydrochloride—yellow columns with oblique ends; Stovaine—greenish yellow columns with chisel-like ends; Subcutine—dirty brown large forked plate-like needles; Tropocaine—green elongated needles which tend to group in rosettes; emerald-green parallelograms, not however resembling those obtained with nycaine, were also obtained; Tutocaine—yellowish golden mass without characteristic form. Photomicrographs of some of the crystals are given. Since cocaine often occurs with other anesthetics especially in illegal goods the authors attempt to devise methods for its detection in the following combinations: Anesthesine-Cocaine; Eucaine A or B-Cocaine; Larocaine-Cocaine; Pantocaine-Cocaine; Percaine-Cocaine; Stovaine-Cocaine; Subcutine-Cocaine; and Tutocaine-Cocaine. Recent literature is reviewed and several methods of separation (*i. e.*, solvents, etc.) and identification ($PtCl_4$, Picric acid, etc.) are discussed. The paper is to be continued.—C. OFFERHAUS and C. G. BAERT. *Pharm. Weekblad*, 72 (1935), 82. (E. H. W.)

Aromatic Waters—Distillation of, for Determination of Volatile Constituent. The apparatus consists of a 1-liter steam-generating Pyrex flask, surmounted by a wide-neck 2-liter separator connected to a vertical condenser. An air inlet is provided in the steam-generator flask to avoid the building up of excessive pressure. After complete removal of the volatile matter, the aromatic principles are extracted with ether in presence of sodium chloride, the solution is dried with calcium chloride, the bulk of the solvent is evaporated on a water-bath and the last traces under high vacuum at 22–24°.—A. GUILLAUME and MME. ADNOT. *Documentation sci.*, No. 23 (1934), 84; *Chimie and industrie*, 32, 644; through *Chem. Abstracts*, 29 (1935), 886.

Barbitals—Titration of, with Silver Nitrate. The author described the method of Budde in which a molecular quantity of the barbital is dissolved in a solution of one gram of anhydrous sodium carbonate in 30 Gm. of water and titrated with $N/10$ silver nitrate. The end-point is reached when a slight milky cloudiness appears. This method is preferred to the alkalimetric method since no indicator is necessary and the end-point is sharp. The author finds that the pharmacopœial method and the silver nitrate method may be combined. He substitutes $N/10$ sulphuric acid for $N/10$ hydrochloric acid; uses only a small amount of indicator and when the end-point is reached adds an additional 10 Gm. of water and 1 Gm. of anhydrous sodium carbonate and continues with the silver nitrate titration. He gives the following results:

		Cc. $N/10$ Alkali.		Cc. $N/10$ $AgNO_3$.		
Luminal verum	232 mg.	9.7		9.5	9.8	
Dial verum	208 mg.	9.6		10.0		
Luminal loco	232 mg.	9.7		9.7	9.9	10.2
Dial loco	232 mg.	9.8	10.0	10.0	10.0	
		Cc. $N/10$ H_2SO_4		Cc. $N/10$ $AgNO_3$		
Medinal loco	206 mg.	9.4		10.7		

J. M. A. HEGLAND, *Pharm. Weekblad*, 72 (1935), 128. (E. H. W.)

Benzaldehyde—Determination of Small Quantities of Chlorine in Commercial. For this purpose a modification of the Schimmel and Company method is recommended (*Bericht der Schimmel and Co.*, 1919–1926). Details of the method are as follows, the lamp used being a Richardson Lamp as described in *J. Inst. Pet. Tech.*, 7 (1921), 26. "The two rolls of silver gauze, A (to free incoming air from chlorine), and B (to collect chlorine in the oil), are first cleaned by immersion in ammonia solution (sp. gr. 0.880), washed with water, dried and gently heated in a flame. They are then slid into silica tubes (in which they fit tightly), being followed by asbestos plugs and, finally, by rubber stoppers. The lamp is filled with benzaldehyde, the wick (not glass capillaries) is adjusted to give a small flame, and the whole is weighed. The rest of the Richardson apparatus is connected (without the usual absorption tube) with the silica tubes placed side-by-side in iron-gauze shields. These tubes are heated to dull redness before the apparatus is connected with the suction pump. The lighted lamp is then slid into position, the air-flow is adjusted to give a small non-smoky flame, and the shield is slipped down on to the mercury seal. The

benzaldehyde is thus burning in a chlorine-free stream of air, and the products of combustion are freed from chlorine by the hot silver gauze, B. When sufficient benzaldehyde has been burnt (this depending upon the expected chlorine content) the lamp is removed and re-weighed. When cool, the tube with gauze, B, is disconnected, the ends, inside and outside, are cleaned, and, without removal of the gauze, placed in a test-tube. Three successive portions of 1.5 cc. of ammonia (sp. gr. 0.880) are dropped on to the gauze, and after this has been left for 10 minutes some 5 cc. of water are used for washing the gauze and tube. The dilute ammonia solution is then acidified with a minimum quantity of nitric acid, a few drops of silver nitrate solution are added, and the precipitated silver chloride is left to settle. Coagulation is assisted by the addition of a few drops of ether. The silver chloride is collected in a Gooch crucible, washed first with $N/100$ nitric acid and then with absolute alcohol, dried at 125° C., cooled and weighed. It is then dissolved in ammonia, and the crucible is re-weighed. Usually a few tenths of a milligram of carbon remain undissolved." The table showing results on commercial oils and on samples containing known amounts of chlorine and also so-called chlorine-free oils is given. The method gives excellent results and it is interesting to note that any sample of oil of bitter almonds contains about 0.001% of chlorine.—C. G. DAUBNEY. *Analyst*, 60 (1935), 29. (A. H. C.)

Cane Sugar Content of Small Volumes of Solutions—Determination of, from Specific Gravity and Specific Rotation. The apparatus for the determination of specific gravity consisted of a Kuhlmann micro-balance and a glass capillary 6–8 cm. long and having a capacity of 5–30 mg. of distilled water. Three determinations are made with three different capillaries and the average value is computed. The average error by the micromethod was 1.8 per cent of the sugar content as compared to an error of 1.3 per cent by the macromethod. The values for micro specific gravity determinations are useful in the calculation of specific rotation by micro-polarization methods.—R. BEUTLER. *Mikrochem.*, 16 (1935), 133. (L. L. M.)

Carbon—Modified Chromic Acid Method for the Determination of. The apparatus consists of a 300-cc. Kjeldahl flask, fitted with a combined acid reservoir and air inlet and a large glass double-surface condenser. The end of the delivery tube from the condenser is connected to a hard glass combustion tube, 15 in. long, filled with powdered lead chromate and copper oxide wire, and plugged with copper gauze spirals. The combustion tube is placed within a shorter length of copper or iron piping, giving a good distribution of heat. The gases are led from the combustion tube through an absorption tube containing pumice chips and sufficient concentrated sulphuric acid to form a lock, and following this into a potash bulb with a calcium chloride tube and two soda-lime tubes, the first of which also contains calcium chloride. The substance to be examined, sufficient to give 0.5 to 1 Gm. of carbon dioxide, is placed in the flask together with potassium dichromate; after sweeping out, sulphuric acid is added and the mixture heated until the reaction is completed.—I. M. ROBERTSON and J. M. SHEWAN. *J. Soc. Chem. Ind.*, 54 (1935), 35T. (E. G. V.)

Carotenoids—Rapid Quantitative Method for the Determination of the Common. Analysis of Beta-Carotene and Leaf Xanthophyll in Thirteen Plant Tissues. A rapid quantitative method for determining carotenoids without separating the components of a plant extract is given. The samples (5-Gm. green weight) are macerated with 25 cc. of acetone and 25 Gm. of quartz sand, the extract decanted into a 250-cc. Erlenmeyer flask and 2 cc. of 95% ethanol saturated with potassium hydroxide is added. This is separated three times with acetone and twice with 35-cc. portions of ether. The pulp and sand are transferred to a Soxhlet extractor and extracted 30 to 60 minutes with ether. This extract contained 30 γ or less of carotenoids. The combined extracts are transferred to a 3-liter separatory funnel containing 1.5 liters of distilled water, whirled gently and allowed to separate for five minutes. The aqueous layer is drained into a second separatory funnel. The contents of the second separatory funnel are extracted with 100 cc. of ether and the ether washings added to the first funnel. The ether extracts are washed four times with 500-cc. portions of distilled water and separated. The ether solution is evaporated *in vacuo* in a 500-cc. balloon flask to 50–60 cc., transferred to a 100-cc. graduate and made up to volume. The solution is analyzed the same day by the spectrophotoelectric method described by Zscheile, Hogness and Young and the analytical procedure devised by Miller.—E. S. MILLER. *J. Am. Chem. Soc.*, 57 (1935), 347. (E. B. S.)

Chloride—Modified Volhard Method for the Determination of. To the chloride solution, acidified with nitric acid, there is added 1 cc. of nitrobenzene for each 0.05 Gm. of

chloride. The nitrobenzene, attaching itself to the silver chloride, inhibits the darkening of the latter in light and improves the end-point when back-titrating with potassium thiocyanate.—J. R. CALDWELL and H. V. MOYER. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 38. (E. G. V.)

Cinchona Bark and Cinchona Decoctions—Alkaloid Content of. The Keller-Fromme method of assay (*Pharm. Ztg.*, 64 (1923), 57) for the alkaloid content of cinchona bark was studied and found to give results which were higher according to the degree of pulverization of the drug. The present authors recommend analysis of finely powdered material (Danish Pharmacopœia, sieve No. 50). No relationship was found, however, as to the quantity of alkaloid extracted in the process of preparation of simple or acidic cinchona decoctions, whether the drug was of the coarseness to pass sieve No. 3 or finer, up to material passing sieve No. 50. On fractional sieving, different fractions were found to vary in alkaloid content (between 6.83 and 10.30%) even if they were then ground fine before analysis.—A. JACOBSEN and S. A. SCHOU. *Dansk Tids. Farm.*, 9 (1935), 1. (C. S. L.)

Cocaine—New Falsification of. The substance examined was a white powder, which appeared to be cocaine hydrochloride, yet it possessed a melting point of 94° C. as compared to a melting point of 186–190° C. for pure cocaine hydrochloride. A solution of the substance gave general alkaloidal tests similar to cocaine. By means of different solubilities in cold distilled water a substance equivalent to one-third of the weight of the original amount used was separated. The substance did not resemble the common adulterants such as boric acid, sugar, sodium bicarbonate, etc., but appeared to be a hypnotic such as sulphonal. It contained no sulphur. When it was sublimed an odor of benzoic acid was perceived. Further study showed this substance to be ethylpara-aminoethyl benzoate or anesthesine (m. p. 90° C.). Precipitates of cocaine and anesthesine with alkaloidal reagents differ only in dilute solution.—E. COLLARD. *J. pharm. chim.*, 21 (1935), 57. (M. M. Z.)

Copper—Detection and Determination of, in Pharmaceutical Preparations. To 2 cc. of the solution (approximately 0.1*N* in hydrochloric acid and with a maximum of 1 mg. of iron) are added 50 mg. of ammonium fluoride to mask the iron as $(FeF_6)'''$, followed by 1 drop of 5 per cent aqueous zinc sulphate and 0.5 cc. of aqueous ammonium mercuric thiocyanate (from 8 Gm. of mercuric chloride + 9 Gm. of ammonium thiocyanate in 100 cc. of water). With a minimum of 5×10^{-6} Gm. of copper or cobalt a violet coloration is produced. Small amounts of copper were found in various preparations.—F. FEIGL and P. KRUMHOLZ. *Sci. Pharm.*, 5 (1934), 19; through *J. Soc. Chem. Ind.*, 54 (1935), 45B.

Copper in Milk—Determination of Minute Amounts of. A 25- to 200-cc. sample of milk, to which 5 drops of glacial acetic acid has been added to prevent foaming, is evaporated over a free flame. After most of the carbon is burned the platinum or quartz crucible containing the residue is ashed in a muffle furnace at 565° C. for 2 to 3 hours. The ash is dissolved in from 1 to 8 cc. of 20 per cent hydrochloric acid and the warmed solution is centrifuged at 1800 r. p. m. for 10 minutes to throw down carbon. The solution is then neutralized with ammonium hydroxide and hydrochloric acid added to make it 1 per cent after bringing to the 10-cc. volume. The solution is saturated with hydrogen sulphide, stoppered and allowed to stand over night. After centrifuging the copper sulphide is dissolved with 4 drops fuming nitric acid. The tube is heated for 10 minutes, then cooled, diluted and ammonium hydroxide is added to give a distinct color; the solution is then made up to 10 cc. Any turbidity is removed by centrifuging. An aliquot containing from 0.001 to 0.005 mg. of copper is taken for the colorimetric estimation with 1 cc. of 0.1 per cent sodium diethyldithiocarbamate; the yellow color is compared with a standard. The copper content of raw milk was found to average 0.077 parts per million. Pasteurized milk and dried milk contain more copper.—L. W. CONN, *et al.* *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 15. (E. G. V.)

Copper—Iodometric Determination of. The procedure is carried out in the usual manner until most of the iodine is consumed by the standard sodium thiosulphate. At this point 0.5 to 1.0 cc. of 4 per cent alcoholic solution of white shellac is added slowly while swirling the contents of the flask. The precipitate is allowed to settle for 20–30 seconds and the titration completed. The shellac solution causes a rapid settling of the turbid precipitate, thus making the end-point more easily observed.—J. R. CALDWELL. *J. Am. Chem. Soc.*, 57 (1935), 96. (E. B. S.)

Ergotoxine—Determination of, in Ergot. A tentative method was adopted. The alkaloids are extracted with ether from an ammonium hydroxide solution, washed and extracted with

tartaric acid solution (1%). The ether is removed by evaporation and aliquots treated with dimethylaminobenzaldehyde solution (1.25 Gm. of dimethylaminobenzaldehyde per liter in a solution containing 650 cc. of sulphuric acid and 0.05 Gm. of ferric chloride). The solution is compared in a colorimeter with either ergotoxine ethanesulphonate or ergotamine tartrate as standards. Results are expressed as per cent of ergotamine tartrate or ergotoxine ethanesulphonate.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 88. (G. S. W.)

Essential Oils—Average Values for Surface-Tensions of. A table containing the surface tensions of various essential oils determined at 20° C. in dynes per centimeter is given.—A. MÜLLER. *Perf. and Ess. Oil Rec.*, 26 (1935), 18. (A. C. DeD.)

Essential Oils—Viscosity Surface Tension, and Capillariscopic Behavior of. The specific viscosities (η) and surface tensions (γ) of 130 essential oils (including varieties of the same oil) are determined by a dropping method. About 86 per cent of the oils investigated have η = 2–10 cp., while 70 per cent have γ = 27–30 dynes/cm. A capillariscope, involving the dropping of the oil on to filter paper, is described (cf. *A.*, 26 (1932), 803). The diameter of the spreading drop is measured at intervals of 5 minutes (up to 60), and results are expressed graphically. Various factors determining capillary behavior are discussed.—A. MÜLLER. *J. pr. Chem.*, 141 (1934), 167; through *J. Soc. Chem. Ind.*, 54 (1935), 46B.

Ferrum Reductum—Evaluation of, by the Sublimate Method. For testing reduced iron, the U. S. Pharm. and Merck's book on testing chemical reagents recommend heating 1 Gm. of the iron with 10 Gm. of mercuric chloride for 5 minutes and then titrating the resulting ferrous chloride solution with potassium permanganate. The results obtained with 10 Gm. of mercuric chloride are shown to be too low because of the mercurous chloride enclosing some undissolved iron. Higher and more accurate results are obtained by using only 5 Gm. of meruric chloride. If it is desired to use more mercuric chloride, the sample should be treated first with only 5 Gm. and the remainder added only after a preliminary boiling of about 1 minute. Instead of mercuric chloride, 10 Gm. of mercurous chloride can be used for 1 Gm. of iron, but this has no advantage.—L. WEISS. *Z. anal. Chem.*, 98 (1934), 397; through *Chem. Abstracts*, 29 (1935), 292.

Galactose—Detection of Provoked, in Urine According to Technique of Fiessinger, and Application of Method of Fleury and Marque. The authors find that the Baudquin and Levin method as applied by Fleury and Marque is best for the detection of galactose. This method involves the purification of the urine with mercuric nitrate by introducing into a 100-cc. round flask 5 cc. of urine accurately measured, 50 cc. of water, 5 cc. of mercuric nitrate reagent and 5 cc. of normal salt solution. The mixture is stirred and diluted to 100 cc. with diluted nitric acid. This is filtered and 5 to 20 cc. of the filtrate is placed in a conical graduate, and to it are added successively 3 cc. of solution of mercuric iodide, 5-cc. normal saline solution, 5 cc. of a suspension of barium sulphate and water up to 80 cc. This mixture is immersed in a boiling water-bath for 6 to 8 minutes, then cooled, and 5 cc. of 20 per cent sulphuric acid is added. The mixture is cooled again, and 5 cc. of 0.1*N* iodine reagent is added. After stirring for some time, the excess iodine is titrated with 0.1*N* sodium thiosulphate with the aid of a microburette. A coefficient was determined for galactose: 1 cc. 0.1*N* iodine equals 5.37-mg. galactose.—W. R. HAZARD, M. HERBAIN and C. VAILLE. *J. pharm. chim.*, 21 (1935), 61. (M. M. Z.)

Graduates—Inaccuracy of Glass. The author discusses allowable variation in graduated apparatus and gives tables of results obtained in checking 25 graduates. Some show considerable inaccuracy while others are fairly accurate. The author concludes that older graduates, which are not mechanically graduated are usually the most accurate. He finds that fancy graduates with colored or molded graduations are usually not very accurate and that there is often a variation in accuracy among graduates of the same manufacture.—P. VAN DER WIELEN. *Pharm. Weekblad*, 72 (1935), 34. (E. H. W.)

Acacia—Identification Reactions for. The ferric chloride, borax and alcohol reactions of the Netherlands Pharmacopœia did not give satisfactory reactions, the precipitates dissolving upon shaking. Upon increasing the pharmacopœial concentrations five times, ferric chloride gave a gelatinous brown precipitate, 0.100 Gm. of borax a gelatinous white precipitate and 5-cc. alcohol a white precipitate. The identification reaction with basic lead acetate was visible in dilutions of 1:10,000. With the latter reaction the author advises that a blank be run especially if the lead precipitate is not immediately visible. It is advised that the following reaction be added to the above: 1 drop of hydrogen peroxide (3%) is added to 5 cc. of a 5%

solution of the gum to which a trace of benzidine has been added. Within a few minutes the solution will assume the color of benzidine blue. The solutions should be made in the cold so that the peroxidase will not be destroyed through the heat of reaction. The author found that old gums required a greater concentration to give a positive reaction and suggests that the peroxidase content of the gum diminishes with age.—I. C. RITSEMA. *Pharm. Weekblad*, 72 (1935), 105. (E. H. W.)

Acacia—Mucilage of, and Detection of Oxidase in. Qualitative and quantitative tests for oxidase and peroxidase in mucilage of acacia are reviewed.—M. SIDO. *Pharm. Ztg.*, 80 (1935), 12. (G. E. C.)

Henna—Evaluation of. Since henna, is used principally for dyeing hair, methods of judging the quality of a sample must have reference to its dyeing properties. The British Pharmaceutical Codex, 1934, describes a test for henna in which white knitting wool is used. The color produced however, does not compare closely with that produced when human hair is used. The best results were obtained by using pure white fine-drawn mohair. The procedure is as follows: Weigh out 2 Gm. of white mohair and tie into a hank. Wash first in 0.1*N* borax solution, then in distilled water and finally dry in the steam oven. Take 4 Gm. of henna in a No. 60 powder and mix thoroughly with 20 cc. of boiling water. Immerse the mohair in the mixture and allow to remain for thirty minutes, after which wash the hank thoroughly and then dry in the steam oven. When dry, press the hank between two microscopic slides and secure them in position by means of rubber bands slipped over the ends. Match the color in the B. D. H. Lovibond tintometer, using the artificial light attachment and by reflected light normal to the surface at 90°.—W. A. N. MARKWELL. *Chem. and Drugg.*, 122 (1935), 157. (T. G. W.)

Homatropine, Hyoscyamine, Scopolamine—Detection of. Tentative microchemical methods were adopted. A drop of gold chloride (1 Gm. of reagent gold chloride in 20 cc. of water) is added to a drop of the alkaloidal solution and the crystals formed are compared with crystals from a control solution. Description of the crystals is given.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 86. (G. S. W.)

Hydrogen Sulphide—Quantitative Estimates of, in Lotions Used in Treatment of Acne. Relative values are given for the hydrogen sulphide content of various lotions used in the treatment of acne vulgaris.—H. GOODMAN. *Arch. Dermatol. Syphilol.*, 28 (1933), 847; through *Chem. Abstracts*, 29 (1935), 290.

Hypochlorite Solutions—Determination of Available Chlorine in, by Direct Titration with Sodium Thiosulphate. The reaction between sodium thiosulphate and hypochlorite solutions was studied quantitatively: (*a*) By titrating an acetic acid solution of sodium hypochlorite with 0.1*N* sodium thiosulphate solution, using starch-potassium iodide paper as an outside indicator; (*b*) by adding an excess of potassium iodide to an acetic acid solution of sodium hypochlorite, and titrating the liberated iodine with the thiosulphate solution, using starch solution as an internal indicator. Results show that thiosulphate, added to an acetic acid solution of a hypochlorite, is completely oxidized to the sulphate and that eight equivalents of chlorine are used per mole of sodium thiosulphate.—V. A. WILLSON. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 44. (E. G. V.)

Hypophosphites—Determination of. A tentative method was adopted. Total hypophosphites are determined as magnesium pyrophosphate, following a procedure analogous to that for phosphoric acid. Calcium is determined on the same prepared solution by precipitation as the acetate and conversion to the sulphate.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 87. (G. S. W.)

Iodine—Determination of, in Plant Material. A tentative method was adopted. The sample, mixed with calcium oxide and copper oxide is ignited in a combustion furnace. The vapors are drawn over hot platinized asbestos and absorbed in potassium carbonate solution. The residual ash is leached and the solution obtained combined with the carbonate solution evaporated to dryness, taken up with water and extracted with alcohol. The alcoholic extract is evaporated to dryness, ignited, dissolved in water, treated with sulphuric sulphurous acids and extracted with carbon disulphide in the presence of sodium nitrite. The carbon disulphide extracts are compared in a colorimeter with standards. The results are expressed in parts per million or per billion.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 73. (G. S. W.)

Iodide—Method for the Colorimetric Determination of Small Quantities of, in Presence of Other Halides. This method is based upon the oxidation of the iodine with nitric acid and its

subsequent extraction with carbon tetrachloride and determining the quantity of iodine by colorimetric comparison with standard solutions of iodine. The authors point out that the use of acid permanganate is impractical when fluorides, chlorides or bromides may occur along with an iodide but that nitric acid of proper concentration is entirely satisfactory. Full details of the procedure and tables showing its accuracy are given.—A. C. BOSE and K. N. BAGCHI. *Analyst*, 60 (1935), 80. (A. H. C.)

Reduced Iron—Note on the Assay of. Report is made of experimental work which compares the proposed method for U. S. P. XI with a modification of the British Pharmacopœia. The U. S. P. XI method heats mercuric chloride solution and reduced iron on a water-bath for ten minutes instead of boiling for five (U. S. P. X) and the B. P. method is with copper sulphate. Comparative results are tabulated, probable error calculated. In the presence of ferric oxide, ferrous sulphide and ferrous phosphide, the copper sulphate method did not give the best results. The mercuric chloride method gave absolute values in the presence of these impurities.—M. OAKLEY and J. C. KRANTZ, JR. *J. Am. Pharm. Assoc.*, 24 (1935), 9. (Z. M. C.)

Lead—Electrolytic-Colorimetric Method for the Microdetermination of. The solution to be analyzed is placed in an electrolytic beaker, together with 4 cc. of nitric acid (sp. gr., 1.42), 8 drops of 3 molar sulphuric acid and enough water to make the volume 35 cc. The anode is a small platinum gauze cylinder and the cathode a spiral of platinum wire. The solution is electrolyzed for 12 to 18 hours at 10 volts with a current of 0.05 ampere; the anode is taken from the solution just as the current is short-circuited. After rinsing, the anode with the lead peroxide deposit is heated at 180° C. for 2 hours and when cold weighed against its tare. The solution remaining after electrolysis together with the liquid from the anode washing is evaporated over a steam-bath to 10 cc. In each of two 50-cc. Nessler cylinders there are placed 2 cc. of 10 per cent potassium cyanide, 5 cc. of 6*N* ammonium hydroxide and 2 Gm. of ammonium acetate. The solution from the casserole is placed in one cylinder and a known amount of a lead nitrate solution, containing 0.01 mg. of lead per liter, is placed in the other; the cylinders are filled to the mark and 3 drops of sodium sulphide solution added to each. The solutions are then compared in a Leitz colorimeter. Small amounts of lead, 2 to 15 mg., can thus be determined with an error well below 1 per cent.—M. RANDALL and M. N. SARQUIS. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 2. (E. G. V.)

Lead in Urine—Quantitative Spectrographic Determination of. The spectrographic determination of lead in urine is described. A Bausch and Lomb Littrow-type quartz spectrograph, capable of taking the region λ2100 to λ8000 Å. on three 25-cm. plates was used. An arc between 7-mm. Acheson regraphitized spectrographic electrodes whose spectra did not show a lead line was adopted as a means of excitation. The quantity of lead excited by the arc was determined by inserting a revolving logarithmic sector in the light beam between the arc and the spectrographic slit. Bismuth is used as the internal standard. The lead line λ2833.2 Å. and the bismuth line λ2898.1 Å. were used. The preparation of solutions and method of calculating quantity of lead from the photographic plates are given.—J. CHOLAK. *J. Am. Chem. Soc.*, 57 (1935), 104. (E. B. S.)

Lipoid—Determination of Total, in Plant and Animal Tissues. Lipoids were extracted from various plant and animal tissues. Ether-alcohol mixture gave too high a value, as the extract also contained carbohydrates and salts: ether or petroleum ether too low, as phospholipins were left behind. The true amount was given by extracting with ether and alcohol for 30 minutes at 60° C. and reëxtracting with petroleum ether.—J. S. CHEN. *Chin. J. Physiol.*, 8 (1934), 195; through *Physiol. Abstracts*, 19 (1935), 563. (S. W. G.)

Meat Extract and Yeast Extract—Suggested Test for Distinguishing between. About 10 Gm. of the sample are digested in a mortar with 20 cc. of 70 per cent acetone solution (in water). The yellow supernatant liquid is run off through a filter and the clear filtrate tested as follows: To 3 cc. of the filtrate a few drops of strong bromine water are added, when darkening in color takes place. (If an excess of bromine be added the dark color vanishes and is not restored by reducing agents.) After standing for 5 minutes a dark red color is developed. Two cc. chloroform are now added and the mixture is shaken. On separating, the chloroform layer is colored deep reddish violet. This test was applied to commercial yeast extracts, and also to a specimen extract prepared in the laboratory from air-dried brewer's yeast. The same result was obtained in all cases. Many of the well-known meat extracts were then submitted to the test, but none gave this reaction. The test gave good results for a mixture of yeast extract and meat

extract. It is interesting to note that a similar acetone extract of egg-yolk gave this pink color with bromine, and also that of the fat-free portion of cheese. It would appear that the tryptophane grouping is free to react with the bromine in the above substances, with the exception of the meat extracts.—R. O. BLENCH. *J. Soc. Chem. Ind.*, 54 (1935), 148. (E. G. V.).

Mercury—Determination of, in Mercurial Ointment. A tentative method was adopted. The sample is digested with nitric acid (1:1), the aqueous extract removed and the residue washed. The combined aqueous extracts are washed with ether and titrated with ammonium thiocyanate, (0.1*N*).—*J. Assoc. Official Agr. Chem.*, 18 (1935), 85. G. S. W.

Morphine—New Colorimetric Method for Determining, and Its Derivatives. The Folin and Malmros colorimetric method for determining glucose is modified so that it can be used for determining morphine and its derivatives. The reduction of potassium ferricyanide is allowed to proceed at a lower p_H. The presence of potassium cyanide to accelerate the reaction is not necessary and the reduction proceeds at room temperature; the reduction reaches maximum values in about 5 hours. Under these conditions, reduction does not take place in derivatives of morphine in which the hydrogen of the phenolic group is substituted by side chains; alpha-monoacetylmorphine, which has a free phenolic group, gives the same values as morphine. At a boiling temperature the reduction of potassium ferricyanide is influenced by other groups, and values for morphine are obtained which are exactly 3 times those obtained at room temperature. At room temperature morphine in a concentration of 1:100,000 can be determined accurately. The method is sensitive and reliable; a 0.151 per cent morphine hydrochloride solution gave 0.154 per cent by this method. Other morphine derivatives can be determined if they have a free phenolic group; those in which the hydrogen is substituted by alcohol or acetyl chains can be assayed by introducing the phenolic group through splitting off the chains.—G. RIZZOTTI. *Boll. soc. ital. biol. sper.*, 9 (1934), 509; through *Chem. Abstracts*, 29 (1935), 292.

Nitrites—Determination of, in Tablets. A tentative method was adopted. Aliquots of a water solution are treated with saturated potassium chlorate. Nitric acid (1:1) is added and, after standing, silver nitrate (0.1*N*). The solution is filtered and titrated with potassium thiocyanate solution. Correction is made for chlorides if present.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 89. (G. S. W.)

Pancreatin—Determination of Amylolytic Activity of. The author finds that the reaction between pancreatin and starch should be continued for at least 1 hour. The determination of amylolytic activity should be carried out at 37° C. Higher temperatures give exceedingly low values.—A. DE CLERCQ. *J. pharm. Belg.*, 17 (1935), 95. (S. W. G.)

Pepsin—Determination of Proteolytic Activity of. The optimum acidity for the proteolytic digestion of coagulated egg albumin has been found by the authors to be at p_H 1.3. Determinations of activity of pepsin or its preparations should be carried out at 37° C.—A. DE CLERCQ and M. VAN HAUWAERT. *J. pharm. Belg.*, 17 (1935), 59. (S. W. G.)

Perchlorates—Determination of. Chlorates are quantitatively reduced in the cold by titanous chloride while perchlorates are not appreciably reduced in dilute aqueous solution, even on prolonged boiling. The perchlorates are completely reduced, however, by a concentrated solution of titanous chloride in a fairly strong sulphuric acid solution.—M. L. NICHOLS. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 39. (E. G. V.)

Petroleum Products—Viscosity of. The Saybolt viscometer is satisfactory for plant control work and for determining specifications of commercial petroleum products, but it is not sufficiently accurate for research purposes. An improved Ostwald viscometer is described. The following equation connects kinematic viscosity (KV) and Saybolt viscosities (S) above 5000: KV = 0.002042 S + 0.40.—W. B. MCCLUER and M. R. FENSKE. *Ind. Eng. Chem.*, 27 (1935), 82. (E. G. V.)

Podophyllum—Determination of. A tentative method was adopted. The drug is percolated with alcohol, 90% of the percolate is collected in one beaker, the remainder in a second beaker. The contents of the first is evaporated to a small volume, poured into cold (10°) dilute hydrochloric (about 0.01*N*) and mixed with the contents of the second beaker. After standing 12 hours in the cold, the precipitate is filtered in a Gooch crucible, dried and weighed.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 89. (G. S. W.)

Potassium Dichromate—Standardization of. A 1-Gm. sample of arsenous oxide is treated with a little water, 1 Gm. of sodium hydroxide is added, the mixture is warmed, and then 50 cc.

of 5 normal sulphuric acid are added. Now slightly less than 1 Gm. of potassium dichromate is added, the solution is stirred, diluted to 400 cc., and allowed to stand for 5 minutes. Three drops of 0.025 molar *o*-phenanthroline ferrous complex, as indicator, and three drops of 0.01 molar osmium tetroxide, as catalyst, are added. The excess arsenous acid is back-titrated with 0.025 normal ceric sulphate; at the end-point the rose color of the solution changes to a clear green.—H. H. WILLARD and P. YOUNG. *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 57. (E. G. V.)

Potassium Iodide—Assay Process for. Of samples of Liquor Iodi Mitis purchased under the Foods and Drugs Act which were satisfactory with regard to the proportion of iodine and potassium iodide only 50% were free from hydriodic acid. In the remainder the hydriodic acid present caused an increase in the iodate titration of 0.15 to 0.4 cc., corresponding to 0.02 to 0.07% of potassium iodide. When it is remembered that different workers can obtain identical results, an error of 0.4 cc. is much too high to pass without correction. All samples of Liquor Iodi Fortis and Mitis should be examined for the presence of hydriodic acid and the iodate titration corrected before the proportion of potassium iodide is calculated. To estimate the hydriodic acid, 10 cc. is titrated with sodium thiosulphate, phenolphthalein or methyl red added and the solution titrated with sodium hydroxide:

Cc. 0.1*N* NaOH used × 0.01279 × 10 = per cent HI
Cc. 0.1*N* NaOH used × 0.0166 × 10 = per cent KI to be subtracted from that found by the official process.

If check is required 10 cc. may be evaporated to dryness, treated with water and evaporated again, the process being repeated until only a faint brown color remains. After drying at 110° C. the residue is ignited at very low temperature for a moment or two. Potassium iodide only remains and may be estimated by iodate as usual.—M. HERD. *Pharm. J.*, 134 (1935), 87. (W. B. B.)

***n*-Propylarsonic Acid—Use of, as a Reagent for the Determination of Zirconium.** Zirconium chloride solution in not more than 10 per cent by volume of hydrochloric acid is heated to boiling and the zirconium precipitated with 25 cc. of a 5 per cent aqueous solution of *n*-propylarsonic acid. The mixture is boiled 2 or 3 minutes, cooled, filtered, the precipitate washed free from chlorides, ignited to constant weight and weighed as zirconium oxide. The presence of tin, thorium, manganese, nickel, iron, aluminum, vanadium, chromium, titanium, copper, cerium, magnesium, zinc, uranium, molybdenum, cobalt, beryllium and cadmium did not interfere. Antimony and bismuth did. Satisfactory results could not be obtained in concentrations of sulphuric acid above 4.5 per cent by volume. Allylarsonic acid, though tried, was not as satisfactory as *n*-propylarsonic acid.—F. W. ARNOLD, JR., and G. C. CHANDLER. *J. Am. Chem. Soc.*, 57 (1935), 8. (E. B. S.)

Quillaia Saponin—Colorimetric Test for. An acid solution of sodium nitrite, followed by excess of alkali, was found to produce a yellow-colored solution. The depth of color was found to be proportional to the amount of saponin present. One per cent solutions of saponins in distilled water were prepared and tested as follows: Ten cc. of these solutions of saponin were placed in Nessler glasses, graduated to 50 cc. One cc. of a 10% aqueous solution of sodium nitrite was added, followed by two drops of sulphuric acid, and after 30 seconds twenty cc. 1*N* sodium carbonate added. The colored solution was then made up to 50 cc. with distilled water. To prevent frothing a few drops of ether were carefully dropped on to the surface of the solution. The full color is not developed for about five minutes, and is then stable for several hours. As yet, it has not been found possible to use this test for the determination of saponin in quillaia bark, as interfering substances are extracted with the saponin, the addition of the reagent giving a very dark colored solution. No method has been found for purifying the saponin without loss. Preparations of senega root give a wine-red color, therefore it is not impossible to detect added quillaia saponin in these. Phenols and other substances which give a reaction with the reagents used should not be present.—J. RAE. *Pharm. J.*, 134 (1935), 59. (W. B. B.)

Quinine—Determination of, in Chocolate Tablets. In contrast to the method of the Greek Pharmacopœia in which cacao butter is removed with ether and the pellets then treated with sodium hydroxide, chocolate tablets are first extracted for 3 hours with petroleum ether in a Soxhlet apparatus. Quinine tannates are less soluble in this than in ether. The residue is

dried and further extracted for 10 hours with alcohol. The alcoholic solution is evaporated, mixed with sodium hydroxide and extracted 3 times with ether. This ethereal extract is repeatedly washed with water, evaporated, dried with alcohol and the residue titrated with 0.1*N* hydrochloric acid with lacmoid indicator. Control analyses showed an error of 0.5–1.6 mg. of quinine in an original content of 60 mg.—A. JUSTINIANOS and J. PIERRY. *Praktika (Akad. Athenon)*, 8 (1933), 173; through *Chem. Abstracts*, 29 (1935), 543.

Quinine, Quinidine and Cupreine—New Color Reaction of, and Its Application to the Determination of Quinine. Quinine, the methyl ether of cupreine, is extracted by the usual solvents, from cinchona bark and purified from ether. The methyl group is removed by warming in a glycerin bath to 180° after adding sulphuric acid. Nitroaniline is added, diazotization is then carried out, 30 per cent sodium hydroxide is added, and finally sulphuric acid is added. A stable red-orange precipitate is obtained which is soluble in 95 per cent alcohol. A similar reaction is produced by quinidine and cupreine. Cinchonine and cinchonidine do not give this reaction. *Quantitative determination of quinine.*—About 0.1 Gm. of drug, accurately weighed and finely powdered is mixed with 0.2 Gm. of calcium oxide and 2 cc. of water. The mixture is digested on a water-bath, 5 cc. of chloroform are added, and then heated to boiling, filtered, the residue is digested again as above and filtered. The liquid is then evaporated and the residue is treated with 30 drops of sulphuric acid, then 2 cc. of water, warmed, then cooled and placed in a 10-cc. graduate. One cc. of this liquid is taken (contains alkaloids from 0.1 × 0.1 Gm. of drug used) and placed in a colorimetric tube and placed in a heated glycerin bath. A temperature of 180° is maintained for 5 minutes, then the tube is cooled and the contents placed in 2 cc. of water. Para-nitroaniline diazo compound is then added, stirred, alkalinized with 10 drops of 30 per cent sodium hydroxide and 10 drops of sulphuric acid is finally added. The product is dissolved in 2 cc. of 95 per cent alcohol, and the orange solution is compared with a standard in a colorimeter. A modification of the method is given for tincture and fluidextract of cinchona.—J. A. SANCHEZ. *J. pharm. chim.*, 21 (1935), 24. (M. M. Z.)

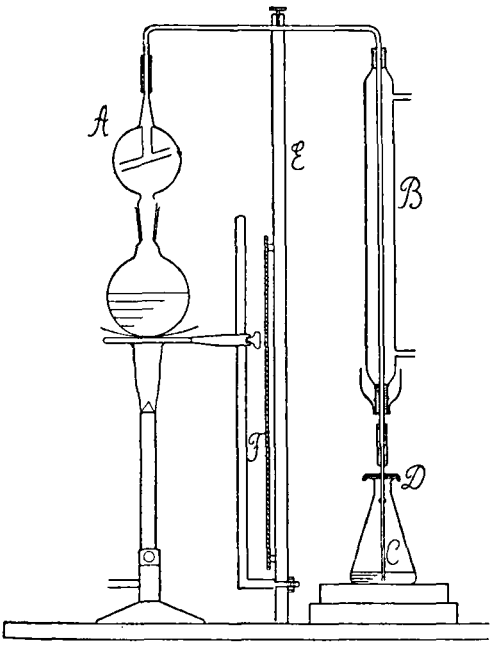
Salts of Organic Acids—Assay Methods for. A method of assay for sodium benzoate and sodium salicylate, described by Henville in 1927, may be used as a general method. In this method the salt is titrated directly with standard acid in the presence of diethyl ether with methyl orange indicator. Consider a salt MA. $MA + HCl \longrightarrow MCl + HA$. The method is applicable where HA is sparingly soluble in water and readily soluble in some solvent immiscible with water; where HA is not too strong an acid, apparent dissociation constant less than 2.5×10^{-3}; where MOH is not too weak, apparent dissociation constant greater than 10^{-6}. It is applicable to ammonium benzoate and salicylate and other salicylates, to sodium barbital and sodium phenobarbital. Procedure and results are discussed.—R. M. HITCHENS, *J. Am. Pharm. Assoc.*, 24 (1935), 11. (Z. M. C.)

Santonin—Determination of, in Mixtures. A tentative method was adopted. The sample, in a Gooch crucible, is washed with petroleum ether (saturated with santonin), and the washings discarded. Extraction is made with hot benzene, the extract evaporated to dryness, dissolved in alcohol and made up to volume. Aliquots are treated with dinitrophenylhydrazine solution (1 Gm. of 2:4 dinitrophenylhydrazine in 90 cc. of water and 10 cc. of sulphuric acid), allowed to stand 48 hours in the dark, filtered, washed with alcohol, dried and weighed.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 87. (G. S. W.)

Sugar—Comparison of Reducing Sugar Methods. Results of determinations of invert sugar by the Allihn, Herzfeld and Munson and Walker methods indicate that the Herzfeld method is the most reliable for determination of invert sugar in raw sugars. The Lane and Eynon volumetric method, which is a tentative one, agreed well with the Herzfeld method.—F. W. ZERBAN, W. J. HUGHES and M. H. WILEY. *J. Assoc. Official Agr. Chem.*, 18 (1935), 118. (G. S. W.)

Sweetening Agents—Microanalytical Studies of Synthetic. The authors describe a modification of their method for the detection of saccharin in beverages. A special stirring apparatus was devised which greatly accelerated the speed of diffusion from the aqueous to the ether layer. By organoleptic tests saccharin may be detected within one to three hours in concentrations of 0.00025 to 0.001 per cent. Fahlberg's method was applied to the quantitative determination of saccharin in beer: The saccharin is hydrolyzed by refluxing for two hours with 20 per cent sulphuric acid. After cooling, the liquid is neutralized carefully with 30 per cent sodium hydroxide (carbonate free), excess base is added and the mixture is then shaken vigorously

in a flask fitted with an overflow tube and distillation arm to absorb the carbon dioxide in the atmosphere of the flask. A distillation apparatus with ground-glass connections is preferred, since the hydroxide splits off alkaline products from rubber stoppers. In the diagram, the overflow tube *A* is attached to a non-corrosive steel tube *B* of 4-mm. internal cross section. The cooling portion is about 20 cm. long. The metal tube is joined to the overflow tube by means of a rubber connection and the delivery end of the tube is connected by the same means to a hard glass capillary *C*. At the beginning of distillation the end of this tube is immersed in 15 cc. of water neutralized to methyl red and placed in a flask which is supported by two blocks. During distillation the flask is covered by a rubber plate weighted with a lead ring *D* through which is passed the glass capillary. *E* is a support for the apparatus, *F* a plate to protect the receiver from heat. Toward the end of distillation the receiver is lowered several centimeters so that the distillate drops into the receiver. If more than 2–3 mg. of ammonia are thought to be present, several cc. of *N*/70 acid are placed in the receiver with the water, otherwise distilled water alone is used.



Saccharin Determination Apparatus.

From one-third to one-half the original volume of liquid is collected and the distillate then titrated with *N*/70 acid, using methyl red as indicator. The error introduced by back-titration with a base is eliminated. One cc. of *N*/70 acid corresponds to 0.2 mg. nitrogen to 2.616 mg. free saccharin, to 3.445 mg. of the sodium salt containing two molecules of water of crystallization, to 2.39 mg. of the water-free salt. The authors, by combining their diffusion method with that of Schmidt, were able to detect saccharin in a concentration of 0.0003 per cent. A sensitive test for salicylic acid, based upon the precipitation of bromo-phenol by bromine vapor is also described.—V. STANEK and P. PAVLAS. *Mikrochem.*, 16 (1935), 211. (L. L. M.)

Tetrachlorethylene — Determination of, in Mixtures. A tentative method was adopted. The sample is refluxed with sodium metal dispersed in xylene. Amyl alcohol is added during refluxing. The solution is cooled, acidified with nitric acid, extracted with water and 0.1*N* silver nitrate added to the filtered aqueous solution. The excess silver nitrate is titrated with 0.05*N* ammonium thiocyanate. As an optional method, the precipitated silver chloride may be weighed.—*J. Assoc. Official Agr. Chem.*, 18 (1935), 84. (G. S. W.)

Theophylline—Quantitative Determination in Soluble Preparations. Comparison of various methods of assay of theophylline showed that an argentimetric method gives too high, and iodometric methods too low results. Only the methylation method of Self and Rankin (*Quart. J. Pharm. and Pharmacol.*, 4 (1931), 346 and B. P. 1932) was satisfactory, but a simpler procedure is described. Although theophylline is quite difficultly soluble in either chloroform or isopropyl alcohol, it is soluble (about 1 part in 24) in a mixture of 3 volumes of chloroform and 1 volume of isopropyl alcohol. An assay is devised using the solvent mixture for isolation. Extracting an acidified theophylline-sodium-acetate solution gave too high results; the acetic acid interferes. This is avoided by evaporating away the acetic acid freed by sulphuric acid before extracting the purine. *Assays* are described as follows: (1) *For theophylline sodium acetate:* Four-tenths Gm. of theophylline salt is mixed with 2.5 cc. 2*N* sulphuric acid and 7.5 cc. water in an evaporating dish and evaporated to dryness on the water-bath. Five cc. of water are poured on the residue and evaporated, then 2 cc. more and evaporated. The residue is warmed with 5 cc.

water and 0.5*N* sodium hydroxide added drop-wise until methyl red (2 drops solution) changes color, then is evaporated to dryness. The residue is rubber up cautiously into 30 cc. of a mixture of 3 volumes chloroform and 1 volume isopropyl alcohol, added portion-wise. The carefully poured off extract is filtered through a small filter into a separatory funnel where the extract is shaken with 5 cc. of wash water, which is tapped away, and then run into a tared flask. Extraction is repeated with two portions of solvent (20 cc., then 10 cc.) which are washed with the same 5 cc. of water used for the first washing. The combined extracts are evaporated to dryness on the water-bath. To prevent spattering and bumping at the last, the flask is immersed in boiling water. The recovered solvent mixture may be rectified and used again. The residue, dried at 100° C. to constant weight, is weighed. Multiplying by 1.100, the weight of anhydrous theophylline is converted to weight of crystalline theophylline. (2) *For aminophylline* (Euphylline): Three-tenths Gm. aminophylline are dissolved in 2 cc. water in a small separatory funnel and *N* or 2*N* hydrochloric acid added until color change of methyl red (2 drops of solution). Then for one minute the solution is shaken with 25 cc. of the solvent mixture described above, the tapped-off extract filtered through a small filter into a tared flask. The extraction is repeated 3 times with 20 cc., 20 cc. and 10 cc. of solvent and the filtered extracts combined in the flask, evaporated to dryness on the water-bath, the residue dried to constant weight at 100° C. The conversion factor from anhydrous to crystalline theophylline is then applied. The titer of aminophylline gives the ethylenediamine content. The ethylenediamine hydrochloride is not dissolved by the solvent mixture. On drying aminophylline 3 days over calcium chloride, besides loss of water, 2.17% ethylenediamine is lost.—F. REINERS. *Dansk Tids. Farm.*, 9 (1935), 11. (C. S. L.)

Titration Apparatus—Continuous Reading. A simple inexpensive apparatus to be used as an aid in teaching electrometric titration is described. All parts except galvanometer and milliameter can be purchased from a radio dealer. Graphite-platinum, tungsten-platinum and silicon carbide-platinum electrode pairs are used instead of calomel half-cell-platinum. Details of procedure are reported. The apparatus has been applied to the titration of some ferrous iron compounds of the U. S. P.—L. H. BALDINGER. *J. Am. Pharm. Assoc.*, 24 (1935), 6. (Z. M. C.)

Vitamin C—Titrimetric Assay of. A review of the method of the Food and Drug Administration, U. S. Department of Agriculture.—B. RÖNNMARK. *Farm. Revy*, 34 (1935), 126. (C. S. L.)

Triethanolamine—Detection and Determination of. In the analysis of creams in which the fatty base is incorporated in water, the material is saponified, evaporated to dryness with lime, and the residue extracted with boiling absolute alcohol. The alcoholic extract on evaporation, yields a viscous residue containing any triethanolamine, glycerol or ethylene glycol which may have been in the original material. It is shown that commercial triethanolamine gives with hydriodic acid a white crystalline substance having the formula $(CH_2OH.CH_2)_3N.HI$ containing 53.6 per cent of the base and having a melting point of 169° C. Details of the method are as follows: "An accurately weighed portion (about 0.5 Gm.) of the viscous residue from the alcoholic extraction described above is evaporated to dryness with 0.5 cc. of constant-boiling 57% hydriodic acid and 5 cc. of water in a glass dish. The residue is stirred with 5 cc. of pure iso-propyl alcohol, transferred to a sintered glass crucible, and washed three times with 5-cc. portions of the alcohol, the crystals being sucked as dry as possible after each washing. The crucible and contents are dried to constant weight at 100° C., and a correction of 1 mg. for each cc. of iso-propyl alcohol used in the transfer and washing of the crystals is applied. The m. p. of the product (169° C.) serves to identify triethanolamine. The weight obtained, multiplied by 0.536, gives the weight of triethanolamine present." The method was tried out on commercial triethanolamine alone and in the presence of glycerol and ethylene glycol with highly satisfactory results.—H. R. FLECK. *Analyst*, 60 (1935), 77. (A. H. C.)

TOXICOLOGICAL CHEMISTRY

Arsenic—Presence of, in Bismuth Preparations. Arsenic determinations were made on 24 samples of bismuth preparations; arsenic was present in none in amount sufficient to cause symptoms.—*Arch. Dermatol. Syphilol.*, 28 (1934), 841; through *Chem. Abstracts*, 29 (1935), 290.

PHARMACOGNOSY

Vegetable Drugs

Aloe—Evaluation of. A very comprehensive research has been made bearing on the chemical composition, physiological action, qualitative, quantitative and physiological evaluation and an interesting account of the use of the crustacean daphnia as a biologic test animal. The author's conclusions are that (1) the chemistry of aloes is by no means sufficiently cleared up to permit chemical evaluation, (2) Curacao aloe is strongest, (3) the residue, freed from all but about 2 per cent of aloin, is almost as active as Curacao aloe, (4) Aloin while less effective is more toxic, particularly as it affects the kidneys, (5) and there is slightly increased activity in alkaline solutions on standing.—A. Viehoever. *Am. J. Pharm.*, 107 (1935), 47. (R. R. F.)

Artemisia—New Crystalline Principles from Indian. In the course of the examination of a large number of *Artemisia* species, many of which were collected on the N. W. Frontier of India, but also many from both adjacent and distant territory, two distinct crystalline principles, differing from santonin, were isolated from certain of these species. One of these crystalline principles was obtained by the ordinary method for the assay of santonin, which fact seemed to indicate some relationship between the two respective bodies, and for laboratory convenience it was named pseudo-santonin. Assay of further samples of *Artemisia* from another district on the N. W. Frontier yielded a crystalline principle quite distinct from either santonin or pseudo-santonin, although in some respects much more closely resembling santonin. For laboratory convenience this second new principle was provisionally named K-santonin to distinguish it from the pseudo-santonin, and to indicate the district from which the material had been collected These two crystalline principles are quite distinct from artemisin, a crystalline principle separated from the mother liquors in working *Artemisia maritima* for santonin. The following table conveniently classifies these various bodies:

Properties.	True Santonin.	K-santonin.	Pseudo-santonin.	Artemisin.
PHYSICAL				
Melting point	172	216–218	184–186	200
Specific rotation	−172.5	−140	−172.5	−84.3
Sensitivity to light	Very sensitive	Much less sensitive	Insensitive	Less so than santonin
REACTIONS				
Alcoholic potash	Carmine-red	Pale carmine-red	Brownish yellow	Pale carmine-red
Sulphuric acid concd.	No color	No color	Immediate dark brown	No color
SOLUBILITIES				
Alcohol (90%)	1–50	1–116	1–15	
Ether 0.720	1–140	1–625	1–312	
Chloroform	1–2.5	1–4.2	1–4.2	Forms a compound
Boiling water	1–416	1–590	1–45	1–60
Cold water	Almost insoluble	Almost insoluble	1–300	

Further chemical investigation reveals that the principle provisionally named K-santonin is a levo-isomer of true santonin. It shall henceforth bear the name of β-santonin. The research of pseudo-santonin is still in progress.—T. Smith and H. Smith. *Pharm. J.*, 134 (1935), 3. (W. B. B.)

Bixa Orellana L—Analysis and Therapeutic Action of. Ripe fruits weighing 12 to 18 Gm. are composed of rind (22 per cent), pulp (68 per cent) and seeds (10 per cent). The rind contains ethereal oil (0.05 per cent), resin (1.0–1.65 per cent), tannins and cellulose. The pulp consists of volatile substances (20–28 per cent), coloring matter known as orlean or annatto (4.0–5.5 per cent), various sugars including sucrose (3.5–5.2 per cent), ethereal oil, a trace of an unknown alkaloid, saponin and tannin. The seed is composed of seed-coat (18 per cent) containing waxes and ethereal oil, and of kernel (82 per cent) containing 8 to 11 per cent of fatty oils, the constants of which closely resemble the fatty oils of *Raphanus sativus* L. Therapeutically, the fruit pulp made into a maceration (2–3 per cent) or a decoction (1–2 per cent) is used for dysentery; a tincture or fluidextract of the seed-coat is used as a tæniafuge, or in the obstinate constipation of swamp fever; a 1.25 per cent infusion of the whole seed is used in the treatment of asthma, for the prevention of night sweats in phthisis, and for the prevention of mucous in the nasopharynx. A kataplasm prepared from the unripe fruit is used as an emollient for leprosy while an evaporated alcoholic extract may be used in a manner similar to that of a mustard plaster. A kataplasm prepared from the fresh leaves is also used as a mild rubefacient.—F. W. Friese. *Pharm. Zentralh.*, 76 (1935), 4. (E. V. S.)

Digitalis—Chemical Study of Sierra Nevada. Crystalline digitalin in the leaves of Sierra Nevada digitalis was determined by the Perrot and Bourcet method (*C. A.*, 22 (1928), 2437); there was found 0.548 Gm. per Kg. of dried leaf, almost twice the quantity characteristic of commercial leaf. Analysis of leaves stabilized in the Vera Guglieri apparatus (*Bol. Univ. Granada*, 4 (1932), 333) showed that only 1–20 of the glucoside remains in the drug.—F. M. MARTIN and M. M. BROCAL. *Anales soc. españ. fís. quím.*, 32 (1934), 838; cf. Giral, *C. A.*, 28 (1934), 857; through *Chem. Abstracts*, 29 (1935), 888.

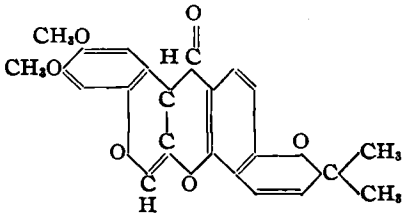
Digitalis—Sardinian. The leaves of *Digitalis purpurea*, var. *tomentosa* from Sardinia contained 1.117 per cent (Gennargentu), 1.101 per cent (Limbara) and 1.080 per cent (Sassari) total glucosides as compared with 0.988 and 0.950 per cent for two commercial samples. The ratios of digitoxin: gitalin: digitonin, digitalin and digitalein were approximately the same for all samples.—I. SIMON. *Arch. farmacol. sper.*, 58 (1934), 101; through *Chem. Abstracts*, 29 (1935), 532.

Iris Versicolor L. and Iris Virginica L.—Methods of Identification of Rhizomes of. Various species of iris are briefly discussed. Because of the importance of Florida as a source, attempt has been made to distinguish the rhizomes of the two most abundant species from *I. virginica* and *I. versicolor*. Eight characteristics were studied: Dimensions, color fracture, comparison of stellar and cortical radial values, count of vascular bundles in cross section, dimensions of vascular bundles and parenchyma cells, and odor. The monograph on *I. versicolor*, N. F. V is open to criticism because a single description is used to describe the drugs from two species which differ markedly in some ways. Separate descriptions with distinguishing points are given. The name *Iris caroliniana* should be replaced by *Iris virginica* because of its priority. In order to distinguish official from spurious species the monograph should have more specific histological data, especially vascular bundle counts and dimensions, stellar and cortical ratios, the color of the drug and color reaction with vanillin and hydrochloric acid.—G. M. HOCKING. *J. Am. Pharm. Assoc.*, 24 (1935), 17. (Z. M. C.)

Labiatæ—Tannin Content of. The use of the *Labiatæ* in folk medicine is probably due to their high tannin content, which varies from 5 to 23 per cent of the dry substance.—H. VOLLMER. *Arch. exptl. Path. Pharmakol.*, 176 (1934), 207; through *Chem. Abstracts*, 29 (1935), 883.

Liquorice Root—Report on, from Cyprus. The unpeeled roots contained water (at 100°) 12.5, matter soluble in chloroform water 25.7, total ash 4.6 and acid-insoluble ash 0.3 per cent, the last two figures being on the moisture-free basis.—*Cyprus Agr. J.*, 29 (1934), 5; through *Chem. Abstracts*, 29 (1935), 292.

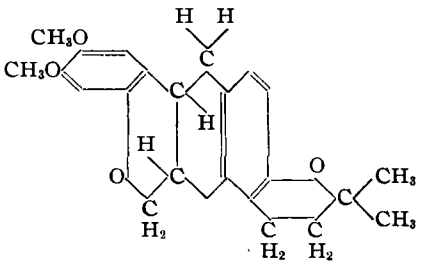
Tephrosia Vogelii—Toxic Constituents of Seed. Analysis of the kidney shaped black-brown seeds gave: 39 per cent protein, 10.5 per cent fatty oil and 5 per cent ash. The acetone extract of seeds defatted with petroleum benzin is toxic to fish. Repeated fractional crystallization of the extractive afforded dehydrodeguelin, $C_{23}H_{20}O_6$, m. p., 232–233°; allo-tephrosin, $C_{23}H_{24}O_7$, m. p., 194–195°; and iso-deguelin, $C_{23}H_{22}O_6$, m. p., 168°. The derivatives of these substances, *viz.*, dihydro-dehydrodeguelic acid, deguelic acid and derric acid agree in properties with the findings of Clark (*J. Am. Chem. Soc.*, 53 (1931), 315, 731, 2370). Allo-tephrosin is not identical with tephrosin or sio-tephrosin, although, by elimination of water, it yields dehydrodeguelin. Upon boiling with acetic anhydride, it gives a substance crystallizing in colorless needles, designated iso-dehydrodeguelin (V).



V

Allo-tephrosin contains one acetylizable hydroxyl group. The melting point of the acetyl derivative is raised during eight days standing in vacuum or in air from 120.5° to 180° without

the compound changing its composition. Acetylization of hydrogenated allo-tephrosin gave $C_{23}H_{27}O_7.COCH_3$. Treatment of the acetyl derivative with *p*-toluenesulphonic acid gave dihydro-dehydrodeguelin, proving that hydrogenation occurs in the pyran ring. By oxidation of allo-tephrosin with potassium permanganate a dicarboxylic acid, $C_{23}H_{22}O_{11}$, m. p., 170° was obtained. Iso-allo-tephrosin, $C_{23}H_{22}O_7$, may be obtained by allowing allo-tephrosin to stand for a day in methyl alcohol saturated with ammonia or by alkaline hydrolysis of acetyl-allo-tephrosin. Elimination of water from iso-allo-tephrosin by sulphuric acid treatment yields iso-dehydrodeguelin (V). Iso-deguelin was isolated only in small quantity. It is optically inactive and reduces ammoniacal silver nitrate solution upon prolonged warming. It is isomeric with rotenone. The oxime melts at 233–234°. Reduction in acetic acid solution with platinum oxide catalyst gave dihydro-desoxy-iso-deguelin, $C_{23}H_{26}O_6$ (XII).



XII

In weak alkaline alcoholic solution, iso-deguelin is converted in two days to iso-allo-tephrosin. The naturally occurring constituents of tephrosia seed undergo extensive modification under the influence of alkalies. Allo-tephrosin does not occur as such in the seed, but is produced by the chemical treatment applied to the drug. It may be regarded as a relatively stable intermediate product of the oxidation of iso-deguelin to iso-allo-tephrosin. All three substances isolated slowly cause paralysis of earth-worms. Concentrations of from 1:100,000 to 1:110,000 produce in 7–8 hours an irreversible paralysis, except in the case of dehydrodeguelin. The effects produced on ascarids are less pronounced than on earth-worms. *In vivo* vermicidal activity was not detected. The lethal dose of the crystalline mixture to mice was 0.01/20 Gm.; the tolerated dose was 0.0066 to 0.007/20 Gm.—K. W. Merz and G. Schmidt. *Arch. Pharm.*, 273 (1935), 1. (L. L. M.)

Vetiver Roots from Uganda. Steam distillation of the ground, pale yellowish brown roots, almost entirely free from rhizomes, yielded 1.8 per cent of a dark reddish brown, viscous oil of $d\ ^{15.5}_{15.5}$ 1.0383, n_D^{20} 1.5248, acid value 76.7 per cent and ester value 22.7 per cent. The oil was soluble in 1 volume of 80 per cent alcohol, but clouded on further addition of 80 per cent alcohol and did not become clear with a large excess of alcohol.—Uganda Protectorate. *Ann. Rept. Dept. Agr.*, 1 (1933), 25; through *Chem. Abstracts*, 29 (1935), 292.

Animal Drugs

Civet—Gathering of. A review.—M. G. Gouderchet. *Drug and Cosmetic Ind.*, 36 (1935), 27. (H. M. B.)

PHARMACY

Galenical

Chloral Suppositories—Note on the Preparation of. A review of the literature concerning the rectal administration of chloral in suppositories is given. The bases suggested for suppositories containing chloral are glycerin or cacao butter. The author reports that glycerin suppositories have been found unsatisfactory. The use of cacao butter alone as an excipient, using the fusion process, permits the incorporation of only 0.25 Gm. of chloral hydrate per 4 Gm. of suppositories in order to have the product melt at body temperature. Suppositories containing 33 per cent cacao butter and 66 per cent wax will retain 1 Gm. of chloral hydrate per 4 Gm. of suppositories, but they melt at a temperature above 45° C. The author suggests that a mixture

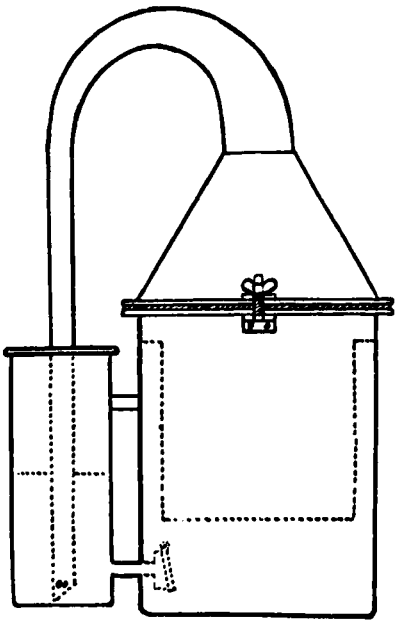
not exceeding 4 per cent of wax in cacao butter would be the most suitable proportion. To prepare such a suppository mixture, the medicament in the form of a fine powder is incorporated in about one-third of the cacao butter, then warmed to 40° C., the remainder of the cacao butter added, and when homogeneous, it is rapidly cooled.—C. J. RAVAUD. *J. pharm. chim.*, 21 (1935), 49. (M. M. Z.)

Drug Extraction Processes—New. The basic operations in modern drug extraction are (1) preparing and grinding of the drug, (2) extraction, (3) concentration and (4) solvent recovery. The various advances in carrying out these operations are discussed.—F. CHILSON. *Drug and Cosmetic Ind.*, 36 (1935), 37, 109. (H. M. B.)

Fats and Waxes—Heating of. Williams shows how 22 different fats and waxes used in the manufacturing of cosmetic creams act under the application of heat and upon cooling. Observations show the importance of care in the cooling and melting of these products.—J. M. WILLIAMS. *Drug and Cosmetic Ind.*, 36 (1935) 33. (H. M. B.)

Orange Juice—Browning of. The browning of orange juice involves oxidation as a primary step. The primary products of oxidation then apparently undergo condensation reactions in which secondary reactions, probably amino acid-sugar reactions, occur. Interference with the formation of the primary products of oxidation by removal of oxygen or addition of reducing substances prevents browning. Sulphites and stannous salts are found to be of value in this regard. The addition of small quantities of sulphites or other antioxidants to pasteurized or benzoated juices or syrups preserves the color of such products. The reducing action of stannous salts, as well as the absence of oxygen in the canned orange juice, accounts for the fact that browning of canned juice does not occur either in plain tin or citrus enamel cans when stored at high or low temperatures. A large number of experimentally packed as well as commercially packed canned orange juices have been examined in the last four years without any browning having been found.—M. A. JOSLYN and G. L. MARSH. *Ind. Eng. Chem.*, 27 (1935), 186. (E. G. V.)

Pharmaceutical Machinery. The article gives a very complete review of modern machinery that is used in pharmaceutical manufacturing processes. The apparati are described in detail and many illustrations are given.—*Chem. and Drugg.*, 122 (1935), 96. (T. G. W.)



Steamer.

Steamer—New. Notes on. Although the steaming of a solution at atmospheric pressure is not an official process for sterilization, it has been shown (*Quart. J. Pharm. Pharmacol.*, 7 (1934), 379–388) that many sterile solutions can be obtained by this simple procedure. That the method is reliable is supported by its inclusion in many foreign pharmacopœias. The steamer is made of copper, weighs 4½ lbs., and is about 14 inches high and 8 inches wide. It will easily stand on the ordinary laboratory tripod. On the inside of the steamer a small basket of perforated zinc carries the material to be sterilized. The capacity in terms of vessels commonly used for this purpose, is one 500-cc., or two 100-cc. or three 50-cc. conical flasks, or eight 25- or twelve 15-cc. vaccine bottles. One of the outstanding features is the rapidity with which the water is raised to boiling. The sketch shows clearly the principles upon which the steamer has been designed.—H. DAVIS. *Pharm. J.*, 134 (1935), 116. (W. B. B.)

Sterilization Notes. The following formulas for injections, with directions for sterilization, are proposed for inclusion in the official formulary of the Chilean Association of Chemistry and Pharmacy: *Injectabilæ Adrenalinæ Chlorhydratis.*—Adrenaline, 1 Gm.; benzoic acid, 0.3 Gm.; hydrochloric acid 0.1*N*, 90 cc.; sodium chloride, 8 Gm.; recently distilled water, to 1000 cc.

Sterilize by tyndallization at 70° for one hour on three successive days. *Inject. Chinini Iodobismutatis.*—Quinine iodobismuthate, 10 Gm.; guaiacolated oil, 5%, to 100 cc. An aseptic preparation. *Inject. Camphoræ Oleosum.*—Camphor, 20 Gm.; Olive oil, neutralized, to 100 cc. Sterilize in a closed container at 115° for fifteen minutes. *Inject. Coffeini Compositum.*—Caffeine, 20 Gm.; sodium benzoate, 28 Gm.; recently distilled water, to 100 cc. Sterilize at 115° for fifteen minutes. *Inject. Emetini Hydrochloridi.*—Emetine hydrochloride, 4 Gm.; sodium chloride, 0.58 Gm.; recently distilled water, to 100 cc. Sterilize at 100° for thirty minutes.—ANONYMOUS. *Pharm. J.*, 134 (1935), 58. (W. B. B.)

Syrup of Hydriodic Acid, U. S. P. X—Stabilization of. The discoloration in syrup of hydriodic acid has been ascribed to decomposition of levulose, due to the fact that sucrose is rapidly hydrolyzed into dextrose and levulose. So the syrup was prepared with hypophosphorous acid to prevent free iodine and dextrose instead of sucrose. If dextrose of C.P. quality is used it gives the best preparation but even with commercial dextrose the stability was greatly increased.—W. J. HUSA and L. J. KLOTZ. *J. Am. Pharm. Assoc.*, 24 (1935), 45. (Z. M. C.)

Tablet Manufacture. The physical properties of good tablets are summarized. The tablet formula is divided into (1) the active ingredients, (2) base or diluents, (3) disintegrator, (4) lubricant and (5) binder or excipients and each of these components are discussed. The following processes in manufacture are tabulated: (1) mixing and milling of dry extracts and chemicals, (2) granulating, (3) drying of granulations, (4) lubricating, (5) compressing and (6) coating, and each is discussed.—ANON. *Drug and Cosmetic Ind.*, 36 (1935), 35, 59. (H. M. B.)

Wine—Effect of Cold and Freezing Storage on the Composition of. Results indicate a decrease in total tartaric acid, cream of tartar, extract and ash on cold storage. This decrease was more pronounced when the wines were decanted and still more pronounced on longer storage. Changes in alcohol, volatile acid, nitrogen, tannin and sugar are not significant.—M. A. JOSLYN and G. L. MARSH. *Ind. Eng. Chem.*, 27 (1935), 33. (E. G. V.)

PHARMACOPŒIAS AND FORMULARIES.

Belgian Pharmacopœia IV—Some Remarks on. A critical discussion of the monographs on chloretone, morphine hydrochloride, solid paraffin, phenacetin, medicinal soap, sodium salicylate, strychnine nitrate and theobromine, and the determination of iodine values for cod liver oil and linseed oil is given.—C. STAINIER. *J. Pharm. Belg.*, 17 (1935), 79. (S. W. G.)

Cod Liver Oil—Critique of 1934 Interim Revision of Text and Assays for U. S. P. The author believes that provision should have been made for the addition of antioxidants to cod liver oil, to delay the onset of oxidation, in such amounts as would be definitely harmless. Methods should have been included for the detection of sophistication by the addition of highly potent vitamin-containing substances, such as halibut liver oil or viosterol. Objection is taken that no specific diet for breeding experimental animals is included, and also that directions for grouping rats for the assay period are too complex. It is apparently felt that the Hawk and Oser salt mixture should be used in the vitamin A test diet, thus eliminating the laborious "problem in stoichiometric—freshman chemistry." The Roentgenographic method for the determination of the degree of decalcification should have been included as optional. Opportunity ought to be provided for public trial and criticism of the method before its official adoption.—B. L. OSER. *Ind. Eng. Chem.*, 27 (1935), 230. (The reply of E. F. Cook is given (*Ibid.*, page 233) as well as a rebuttal by Oser.) (E. G. V.)

Homeopathic Pharmacopœia—German. The second revised edition of the German Homeopathic Pharmocopœia will be ready for distribution March 31, 1936. A brief summary of the conditions existing before the recognition of the present pharmacopœia is given. At present a Commission is working to unify the international standards for homeopathic pharmacopœias and to consider a standard nomenclature. A few of the corrections of the text are taken up and some of the specifications of the pharmacopœia noted. A method of capillary analysis of homeopathic tinctures sensitive to a dilution of D8 is described. The method may be modified so as to be applicable to globules, tablets and triturations. The pharmacopœia contains about 1000 preparations considered in fairly common usage and an appendix containing about 500 more arranged in tabular form.—K. HAAS. *Schweiz. Apoth.-Ztg.*, 73 (1935), 29, 40. (M. F. W. D.)

Microchemistry—Rôle of, in Pharmacopœias. At present very little microchemistry is employed in the testing of chemicals, although the German Pharm. VI and the Swiss Pharm. V do include a method of micro-sublimation for testing one drug. The micromethods, while economizing on samples and reagents, in general require expensive and specialized apparatus and for this reason will probably not come into general use. The article includes a comparison of the macro- and microchemical methods for the identification of several anions, cations and compounds, which methods might easily be substituted for existing tests.—ROSENTHALER. *Scientia Pharm.*, 6 (1935), 7. (M. F. W. D.)

Pharmacopœia—London Hospital. The previous edition of the London Hospital Pharmacopœia was published in 1925, and a comparison of this new volume with its predecessor shows that the main reason for the revision has been the publication of a new British Pharmacopœia. Apart from the B. P. innovations, there is very little that is new in the pharmaceutical contents of the book.—ANONYMOUS. *Pharm. J.*, 134 (1935), 7. (W. B. B.)

Shellac, B. P. C.—a Criticism. The author criticizes the monograph headed, "Lacca (Lac.) Shellac," from the standpoint of accuracy of nomenclature used. He also criticizes the omission of *Acacia Catechu* and *Zizyphus Xylopyra*, while *Ficus religiosa* and *Shorea robusta* have been used and are only of minor importance. Other criticisms of this monograph are recorded.—E. J. PARRY. *Chem. and Drugg.*, 122 (1935), 46. (T. G. W.)

U. S. P. Revision. A summary of some of the proposed changes of the U. S. P. Revision is given for the following: Concentration of Diluted Acids, Acidum Boricum, Aqua, Aqua Destillata, Arsenii Iodidum, Barii Sulphas, Liquor Hydrogenii Dioxidi, Magma Magnesia, Pilulæ Ferri Carbonatis (Assay), Potassii Carbonas, Sodii Benzoas, Sodii Iodidum, Sodii Phosphas-Tinctura Ferri Chloridi.—ANONYMOUS. *Pharm. J.*, 134 (1935), 90. (W. B. B.)

NON-OFFICIAL FORMULÆ

Chapping—Preparations for. Ingredients and methods of manufacturing of soothing creams, ointments and lotions offered.—ANON. *Drug and Cosmetic Ind.*, 36 (1935), 145. (H. M. B.)

Creams—Preparation of Cosmetic. Problems in the production of cleansing, cold and tissue creams are discussed. Formulas are offered.—J. M. WILLIAMS. *Drug and Cosmetic, Ind.*, 36 (1935), 143, 144, 146. (H. M. B.)

Sinclair's Glue. Sinclair's glue is an inexpensive adhesive used as a substitute for plaster in applying extension to fractured limbs. The original formula, which still appears in the B. P. C. 1934, contained two hygroscopic substances, glycerin and calcium chloride, to prevent excessive drying and brittleness in use. The present formula contains no calcium chloride because, experience has shown, the calcium chloride reduced the adhesive properties. Two formulas for Sinclair's glue are now in use. Formula No. 1 is: "Very good" glue or gelatin, 50; water, 100; glycerin, 4 or 6; thymol or menthol, 0.15%. The smaller amount of glycerin is for summer or tropical use, and the larger amount for winter. Formula No. 2, which is as follows, is occasionally used: Isinglass, 50; gelatin, 50; water, 200; tannic acid, 12; glycerin, 8 or more; thymol or menthol, 0.15%. This second formula forms a stronger adhesive and is perhaps more elastic.—W. A. KNIGHT. *Pharm. J.*, 134 (1935), 7. (W. B. B.)

DISPENSING

Incompatibilities—Ionic Reactions as the Cause of. A table showing the insoluble products and their colors formed from cations and anions usually encountered in qualitative analysis is given.—A. MOSIG. *Pharm. Zentralh.*, 76 (1935), 33. (E. V. S.)

Vehicles for Medicines—Study of. IX. Fruit Syrups. Variableness in fruit syrups, because of fermentation, to destroy pectin may explain their limited use. Extensive experimentation with degrees of temperature, avoiding exposure to air and other methods have been tried. The addition of 0.1 per cent benzoic acid to strained fruit juice and standing at room temperature until the filtered juice will remain clear when one-half its volume of alcohol is added, proved satisfactory. The presence of benzoic acid permits activity of the pectase but inhibits vinegar and other bacterial fermentation. Objections to use of benzoic acid are discussed. Three formulas are submitted: syrup of raspberry, syrup of strawberry and syrup of cherry. Syrup

of cherry has a higher flavor if the juice is in contact with the crushed stones for some time. Examples of their usefulness as vehicles are given.—B. FANTUS, H. A. DYNIEWICZ and J. M. DYNIEWICZ. *J. Am. Pharm. Assoc.*, 24 (1935), 46. (Z. M. C.)

PHARMACEUTICAL HISTORY

Acacia. Historical facts are recorded.—H. G. KELBLY. *Drug and Cosmetic Ind.*, 36 (1935), 97, 101. (H. M. B.)

Calcium Lactophosphate Preparations—History of. First suggested in 1869, calcium lactophosphate was introduced into U. S. P. of 1880 and continued in subsequent issues until the tenth when it was dropped and incorporated into N. F. V. An elixir has been in each N. F. An emulsion of cod liver oil with calcium lactophosphate enjoyed considerable popularity but has dropped out of use.—W. J. HUSA and A. P. MCLEAN. *J. Am. Pharm. Assoc.*, 24 (1935), 58. (Z. M. C.)

History—Value of, in the Drug Store. The author pleads for an interest in things historical and shows how the drug store may make use of historical exhibits. Colleges of pharmacy can collect historical material and can assist in interesting young pharmacists in the history of medicine and pharmacy.—F. B. KILMER. *J. Am. Pharm. Assoc.*, 24 (1935), 55. (Z. M. C.)

Maimonides—Medical Works of, and His Treatise on Personal Hygiene and Dietetics. This year marks the octocentennial of the birth of this Hispano-Jewish philosopher, theologian, physician and astronomer. Although his fame as a distinguished and the most rational physician of the Middle Ages is great, it is overshadowed by his reputation as a philosopher and Talmudist. Maimonides practiced medicine with religious fervor and his extensive medical knowledge was sought by the Court and general population alike. His medical writings were voluminous and covered the field quite comprehensively, for those days. He also is known for his works on diet and personal hygiene, poisons and their antidotes, special treatises on asthma and hemorrhoids. To some extent he championed science against the fundamentalism of the Bible, though he was at all times honest and consistent in the belief of the truth of the Aristotelian system and convinced of the truth of the Mosaic doctrine and of the Divine origin of the Torah. Though much can be said pro and con for this and other of his works, at least Maimonides must be credited with the fact that he pointed out that philosophy and science did not begin nor did it end in the Scriptures and Talmud.—L. GERSHENFELD. *Am. J. Pharm.*, 107 (1935), 14. (R. R. F.)

Pharmacy—History of, in the Netherlands. This address by Dr. Hk. Cohen at the celebration of the 90th anniversary of the Rotterdam Department of the Netherlands Association for the Advancement of Pharmacy contains an excellent historical review of pharmacy in the Netherlands beginning with the guilds of the seventeenth century and continuing to the recent past. Historical sketches of many famous Dutch pharmacists: van Anckeren, van der Schinne, Mulder, Fortuyn, Robertson, Grutterink, Nortier, Eshuyes, van der Burg, de Vrij and others, and their influence on pharmacy are included.—*Pharm. Weekblad*, 72 (1935), 42. (E. H. W.)

Urinalysis among the Ancients.—The author describes the methods employed for the investigation of urine in diagnosis and prognosis among the ancients. Beginning with Hippocrates in the 5th century B. C. he carries his history through the middle ages.—M. WAGENAAR. *Pharm. Weekblad*, 72 (1935), 124. (E. H. W.)

PHARMACEUTICAL LEGISLATION

Legislation—Food and Drug. Attention is directed to the position of the American Association of Colleges of Pharmacy in the matter of "sane, adequate revision of the Pure Food and Drug Act" and of its vote favoring "Senate Bill No. 2800 or a measure of greater merit" at its convention last May. At a meeting of the National Drug Trade Conference, Dean DuMez set forth the position of the Association in a statement of the more important provisions which should be incorporated in any new legislations. These provisions are quoted in full.—E. LITTLE. *J. Am. Pharm. Assoc.*, 24 (1935), 61. (Z. M. C.)

MISCELLANEOUS

Hospital Pharmacy Practice—Innovation in. The author tells something of the work which led up to the publication of the Intern's Handbook, something about the book itself, information

as to pharmacy service and its regulations. Procedure in issuing drugs is described and general pharmaceutical organization.—J. S. MORDELL. *J. Am. Pharm. Assoc.*, 24 (1935), 50. (Z. M. C.)

Pharmaceutical Specialties—Necessity of Controlling. A general discussion of the development of medicinal preparations is given, several official standards being mentioned. In 1920 the government of Netherlands set up an official Institute for pharmacotherapeutic research which in the past few years has been hampered by reduced appropriations. The work of the Institute, however, has shown the prevalence of untruthful advertising. The Institute holds a monopoly on the manufacture of certain foreign specialties, tests medicaments not evaluated by physiological means, and sends monographs and other information to both pharmacists and physicians. No one may use the name of the Institute in advertising without permission from it nor without compliance with the regulations set up by the Institute. In 1932 the Swiss Society of Pharmacy organized a laboratory for the control of medicaments, which laboratory analyzes drugs, chemicals and specialties. A discussion of the American system of control of proprietaries is undertaken, enumerating the rules set down by the Council of the Am. Med. Assoc. for recognition in New and Non-official Remedies.—L. DAUTREBANDE and E. ZUNZ. *Schweiz. Apoth.-Ztg.*, 73 (1935), 13, 25, 37. (M. F. W. D.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Alkylhydroxybenzenes—Anthelmintic Studies on. I. Alkylpolyhydroxybenzenes. A series of alkylpolyhydroxybenzenes have been studied for their anthelmintic and toxicological actions. Hexylresorcinol was especially studied. Although this substance is toxic to cats, it is relatively non-toxic to rats, dogs and man. From extensive studies the authors conclude that hexylresorcinol is probably the best substance to be used against human ascaris and hookworm. In amounts of 0.1 Gm. per year of age up to an adult dose of one gram hexylresorcinol removes 90–100 per cent of the ascaris parasites. It is somewhat less effective against hookworm.—P. D. LAMSON, H. W. BROWN and C. B. WARD. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 198. (E. C. L. M.)

Alkylhydroxybenzenes—Anthelmintic Studies on. II. Ortho- and Para-*n*-alkylphenols. This paper is a continuation of the systematic study of anthelmintics. Of the several mentioned in this series *o*-*n*-heptylphenol was found to produce no gross or microscopic lesions after an oral administration of 3-cc. doses to dogs. Upon man in doses four times as great as hexylresorcinol it removed 38% *Ascaris lumbricoides*, 58% *Necator americanus* and 32% *Trichuris trichiura*, compared with 90 to 100 per cent, 70 to 80 per cent and 30 to 50 per cent removed by hexylresorcinol.—P. D. LAMSON, *et al.* *J. Pharmacol. and Exper. Therap.*, 53 (1935), 218. (E. C. L. M.)

Alkylhydroxybenzenes—Anthelmintic Studies on. III. 6-*n*-Alkyl-meta-cresols. The complete series of 6-*n*-alkyl-*m*-cresols from cresol through 6-*n*-decyl-*m*-cresol was studied for their anthelmintic and toxicological properties both upon animals and man. 6-*n*-Hexyl-*m*-cresol is a less effective ascaricide than hexylresorcinol in man.—P. D. LAMSON and H. W. BROWN. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 227. (E. C. L. M.)

Alkylhydroxybenzenes—Anthelmintic Studies on. IV. Isomerism in Polyalkylphenols. This is a study of polyalkylphenols including their ascaricidal properties and local irritant effects. No single substance reported in this paper shows combined properties of ascaricidal effect, toxicity and local irritant action which would indicate that it would be a more practical human ascaricide than hexylresorcinol.—P. D. LAMSON, *et al.* *J. Pharmacol. and Exper. Therap.*, 53 (1935), 234. (E. C. L. M.)

Alkylhydroxybenzenes—Anthelmintic Studies on. V. Phenols with Other Than Normal Alkyl Side Chains. A series of alkylphenols with other than normal alkyl side chains has been synthesized and studied for their ascaricidal properties. None is as active ascaricidally as hexylresorcinol.—P. D. LAMSON, *et al.* *J. Pharmacol. and Exper. Therap.*, 53 (1935), 239. (E. C. L. M.)

Camphor—Comparison of Toxicity and General Actions of Natural and Synthetic, on Guinea Pig. Samples of natural official dextrorotatory camphor and racemic synthetic camphor

were tested on guinea pigs of from 300 to 750 Gm. To overcome variations due to the animal, several sets of four each were taken for each dose. Warm solutions of camphor of about 10% were tested. Results showed synthetic camphor to be more toxic than natural camphor. The smallest dose causing death in the case of synthetic being 1.60 Gm., as compared to 1.90 Gm. for the natural. Symptoms of intoxication were produced by 0.3 Gm. of synthetic as compared to 0.7 Gm. of natural. Although the symptoms of intoxication were of the same order; nevertheless, convulsions were more severe in the case of the synthetic camphor.—R. HAZARD and R. LARDÉ. *J. pharm. chim.*, 21 (1935), 97. (M. M. Z.)

Cinchophen and Tolysin—Elimination of Uric Acid from Rats' Liver by Action of. The maximal effect in decreasing the uric acid content in the livers of rats for phenylcinchoninic acid (cinchophen) and the ethylester of paramethylphenylcinchoninic acid (tolysin) was about 0.01 Gm. per Kg. body weight orally daily. A noticeable effect on the output of uric acid was obtained by the administration of 0.0008 Gm. daily. This corresponds to about 0.05 Gm. for a seventy Kg. human adult. When the amount of these drugs was increased to 0.02 Gm., there was a slightly greater loss in body weight than for controls upon the same diet. A very severe loss of body weight to the extent of from 18% to 20% was noticed after the daily administration of 0.6 Gm. of tolysin or 0.2 Gm. of cinchophen. Free phenylcinchoninic acid therefore proved to be far more toxic than the ester.—O. FÜRTH and E. EDEL. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 105. (E. C. L. M.)

Croton Resin—I. Toxicity Studies Using Goldfish. The resin was isolated from the methanol extract of the croton bean by a modification of the process of Cherbuliez. The relative toxicities of croton oil, the alcohol-soluble portion of the oil and croton resin were tested on goldfish. The resin is shown to be more toxic than rotenone.—J. R. SPIES. *J. Am. Chem. Soc.*, 57 (1935), 180. (E. B. S.)

Croton Resin—II. Toxic and Vesicant Action of Certain of Its Derivatives. Hydrogenation of croton resin with nickel and platinum reduced the iodine number from 53 to 38 but did not decrease the toxic or vesicant action. Bromination decreased these properties. Complete methylation of the hydroxyl group produced a physiologically inactive resin. Goldfish were used in the tests.—J. R. SPIES. *J. Am. Chem. Soc.*, 57 (1935), 182. (E. B. S.)

Digitalis—Assay on Normal and Exsanguinated Cats. It has been found that when digitalis preparations are assayed on a cat in which blood has been replaced by physiological saline, the lethal dose is smaller than that required for a normal cat. There seems to be indication that the active principles of digitalis may combine with the proteins of the blood to render them less potent but this has not yet been established.—D. I. MACHT. *J. Am. Pharm. Assoc.*, 24 (1935), 15. (Z. M. C.)

Digitalis Lanata and D. Purpurea—Pharmacological Action of. The activity of *D. lanata* is 25 per cent greater than that of *D. purpurea*. The activity is maintained for a year in carbon dioxide gas. The activity of *D. lanata* treated with chloroform and dried in hot air is less than when it is dried at room temperature.—A. RABBENO and O. MARINI. *Arch. int. Pharmacodyn.*, 48 (1934), 297; through *Physiol. Abstracts*, 19 (1935), 615.

Dinitrophenol—Metabolic Activity of Compounds Related to. In summarizing their studies the authors conclude as follows: 1. Fifty compounds chemically related to 2–4 dinitrophenol have been tested for power to stimulate metabolism in rats, pigeons and dogs, using changes in body temperature as an index to the metabolic changes. 2. When either the hydroxyl or nitro-groups of 2–4 dinitrophenol are modified by substitution with other groups or by change in position, the action of the compound as a metabolic stimulant is either greatly reduced or completely abolished. 3. Either active or inactive compounds may be produced by adding extra groups to the dinitrophenol molecule, or by introducing nitro-groups into other cyclic compounds. 4. Picramic acid, dinitrohydroxydiphenyl and 2–6 dinitrophenol were found to produce increases in temperature, but only to small degrees. 5. 2–4 Dinitro-α-naphthol was found to be inactive in rats, but 25 per cent more toxic in pigeons, for a given degree of metabolic stimulation, than dinitrophenol. 6. Dinitro-*o*-cresol stimulated the metabolism of both rats and pigeons, but was three times as toxic in the former and 11 per cent more toxic in the latter than the dinitrophenol. 7. 2–4 Dinitro-*o*-cyclohexylphenol and the similar pentyl compound did not raise the temperature of rats. Both compounds were effective stimulants in pigeons, but despite claims of about 400 per cent greater activity and a lesser toxicity than dinitrophenol, they were found to

require about the same absolute dose as the latter drug for a given degree of response. Their toxicities were only 15 per cent and 4 per cent less, respectively, than the toxicity of dinitrophenol. 8. The relative values of these active compounds for human therapy must, therefore, be decided on the bais of their freedom from undesirable side-actions, since the pharmacologic evidence is contradictory, or indicates insignficant differences between them. Some of the more important side actions cannot be tested for in animals, so that cautious clinical trials are indispensable.—M. L. TAINTER, F. W. BERGSTROM and W. C. CUTTING. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 58. (E. C. L. M.)

Disinfectants—Tests for. References are made to the Chick-Martin and rat tail tests for disinfectants. The rat tail test is briefly described and the effectiveness of various disinfectants by this method is shown. The disinfectants tested included propyl alcohol, ethyl alcohol, iodine, phenol, silver nitrate, corrosive sublimate, Dakin's solution, formaldehyde, phenosalyl, hydrogen peroxide and resorcin, all at various dilutions. Propyl alcohol ranked first in effectiveness and 70 per cent alcohol second. All the other disinfectants were good only in concentrations too high for daily use.—J. CHRISTIANSEN. *Lancet*, 1 (1935), 114. (B. S. R.)

Ergot—Active Constituents and a Pharmacological and Chemical Study of. Reference is made to a series of ten reports published during 1929–1930, and some of the important conclusions. The investigations have been continued for the purpose of determining whether or not the oxytocic effects of purified alkaloids are the same as the crude extracts. Pregnant cats were used as test animals and details of the method are given. The activity of hydro-alcoholic extracts, aqueous extracts and salts of ergotoxine and ergotamine were compared pharmaceutically and pharmacologically. Since anesthetics depress gastro-intestinal function, the possibility that the small dose volume of the active principles might explain delayed action was studied. Tests indicated that absorption is chiefly from small intestine. The greatest sensitivity to orally administered ergot seemed to be just preceding, during and immediately after, labor. There was confirmation that commercial salts of ergotoxine and ergotamine are not wholly representative of the action of the drug or its extracts. Further investigation of a new substance obtained in hydro-alcoholic extracts was demonstrated. This hydro-alcoholic percolate was handled very carefully and separated into a "total alkaloid fraction" and an "alkaloid-free fraction." The latter tested pharmacologically was shown to have no significant uterine activity. The "total alkaloid fraction" tested pharmacologically was shown to contain all the significant characteristic uterine activity of ergot. It showed also that the isolated guinea-pig uterus method is unreliable. General analysis of results leads the author to believe that crude extracts probably owe superior activity to an unidentified substance. This new substance behaves like an alkaloid and should be classed as a new member of the "total specific alkaloids of ergot."—M. R. THOMPSON. *J. Am. Pharm. Assoc.*, 25 (1935), 24. (Z. M. C.)

Ergot—U. S. P. Assay for. A note on the revision of the assay process for ergot and fluidextract of ergot, U. S. P. The revision was made during 1933, and became official in the United States on January 1, 1934. Ergotoxine ethanesulphonate was adopted as the official ergot standard.—ANONYMOUS. *Pharm. J.*, 134 (1935), 61. (W. B. B.)

Ergotamine Tartrate—Effect of, on Cerebral Circulation of Man. The striking effect of ergotamine tartrate in the treatment of migraine lead the authors to investigate the physiological action of this drug upon human subjects with especial reference to its action on the intracranial circulation. The drug was given in doses from 0.25 to 0.5 mg. intravenously to unanesthetized patients. In most cases the drug produced a moderate increase flow of blood through the brain. This increase was probably secondary to an increase in systemic blood pressure. These findings do not explain the relief of headache which follows the injection of this drug.—W. G. LENNOX, E. L. GIBBS and F. A. GIBBS. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 113. (E. C. L. M.)

Insulin—Quantitative Determination of, in Fluids, Tissues, etc. Seven methods for the quantitative determination of insulin are reviewed critically. The four methods approved are those of Fisher and Noble; Mauzeri; Baker, Dickens and Dodds; and Blades and Adams.—O. KAUSCH. *Pharm. Ztg.*, 80 (1935), 33. (G. E. C.)

Insulin Preparations—Standardization of. The first blood test after insulin injection is made after 1 hour and 30 minutes by the Toronto method. At that time, the blood sugar has passed through the minimum and is ascending again. It was found that the lowest level is obtained at 45 minutes. The quantities injected were 0.75 and 1.0 international unit per 2-Kg.

animal, calculated approximately and given intravenously. The dose was reduced or increased in accordance with the deviation weight from 2 Kg., this factor being avoided in the final calculation. It was found by comparison with an international standard, that this method gives perfect agreement with the Toronto method. The sugar was determined by the method of Hagedorn-Jensen.—C. COLOMBI, M. LONG and A. TOSATTO. *Biochem. terap. sper.*, 21 (1934), 378; through *Chem. Abstracts*, 29 (1935), 551.

Morphine and Dilaudid (Dihydromorphinone Hydrochloride)—Comparative Study of Actions of, on Intact Small Intestine of Dog. The authors studied the effect of morphine and dilaudid upon the ileum and jejunum of dogs and found that the minimal effective intravenous dose for jejunal effect of dilaudid hydrochloride was about 0.0002 mg. × Kg. body weight while that of morphine sulphate was 0.002 mg. For the ileum 0.0003 mg. of dilaudid hydrochloride and 0.003 mg. of morphine sulphate was needed. In small and medium doses dilaudid hydrochloride was ten times as effective as morphine sulphate. Further comparisons of these drugs were made in varying doses upon the tonus and the amplitude and number of rhythmic contractions of the intestines under various conditions.—C. M. GRUBER and J. T. BRUNDAGE. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 120. (E. C. L. M.)

Morphine, Codeine and Related Substances—Respiratory Effects of: III. Effect of Morphine, Dyhydromorphine, Dihydromorphinone (Dilaudid) and Dihydrocodeinone (Dicodid) on Respiratory Activity of Rabbit. Morphine, dihydromorphine, dilaudid and dicodid were given subcutaneously to rabbits and a comparison made as to the effectiveness of these compounds in decreasing the rabbits' respiratory rate, minute volume and sensitivity to stimulation by carbon dioxide. The minimum dose (per Kg. body weight) of the base required to decrease the respiratory activity was found to be as follows: morphine 0.32, dihydromorphine 0.22 to 0.27, dilaudid 0.027 to 0.035 and dicodid 0.21 to 0.30.—C. I. WRIGHT and F. A. BARBOUR. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 34. (E. C. L. M.)

Sunburn Preventives—Standard for, and a Method of Testing. Using the reaction of the skin as an indicator, a definite reading may be obtained as to how the product concerned will protect the skin and to what degree. The author uses the method based on this reaction, known as "Erythemal Reaction." The anterior portion of the forearm is exposed to a 550-watt quartz mercury lamp for twenty minutes. For best results the burner itself should be horizontal and not less than 3 inches long corresponding exactly with the length of the field being radiated. The method for the evaluations of results is given in detail.—L. STAMBOVSKY. *Perf. and Ess. Oil Rec.*, 26 (1935), 3. (A. C. DeD.)

Vitamin A—Determination of, Values by Method of Single Feedings. The potency of samples of carotene, cod liver oil, kale and calf liver as sources of vitamin A was tested on rats depleted of vitamin A by feeding a single dose and observing the effect on growth and survival time. This method was found to give quite as reliable results as the more laborious method of daily feeding. It has the advantage of eliminating the possibility of deterioration of the activity of the preparation being tested during the course of the assay.—H. C. SHERMAN and E. N. TODHUNTER. *J. Nutrit.*, 8 (1934), 347; through *Physiol. Abstracts*, 19 (1935), 589.

Yeasts—Quantitative Determination of Biologic Value of Medicinal. Methods for determining the activities of medicinal yeasts are critically reviewed. Standardization of yeast products is urged and requirements to be met are suggested.—A. J.-J. VAN DE VELDE. *J. pharm. Belg.*, 17 (1935), 1, 21. (S. W. G.)

TOXICOLOGY

Amidopyrin—Agranulocytosis Due to. Both experimental and clinical evidence is reported. Amidopyrin in therapeutic doses produces a marked fall in the granulocyte and other blood cell counts of sensitive individuals. This action takes place in one to two hours. At present it is not known whether an allergic condition is developed or whether certain individuals are permanently hypersensitive or are merely hypersensitive at certain periods according to unknown conditions such as hormonal unbalance or absorption of toxins. A number of case records are reported. The greatest frequency of the disease was found in the age group of 40–49 years in women and 60–69 years in men in seventy-four reported cases.—P. PLUM. *Lancet*, 1 (1935), 14. (B. S. R.)

Antidotes—I. General Plan. The literature is being searched for information about poisons and their antidotes and laboratory studies are being made.—J. C. MUNCH and F. E. GARLOUGH. *J. Am. Pharm. Assoc.*, 24 (1935), 38. (Z. M. C.)

Chromium Compounds—Toxicological Study of Some. The author reports that injections under the skin of potassium bichromate cause the formation of lesions, which is due to the causticity of the compound. Small doses produced abcesses. A thorough study of the action of chromic chloride, potassium chromate and potassium bichromate was made. The action of these compounds is chiefly through the production of lesions in the skin and changes in respiration with perforations of the nasal septum. Symptoms produced in dogs and rabbits, and the amount of chromium recovered from the various organs of the animals are recorded. When bichromate is absorbed only slightly, hemorrhage occurs, and changes in respiration are observed. Chromic chloride is less toxic than the chromate or bichromate. Small doses of bichromate produced death in 2 days in the case of dogs. The author concluded that absorption in small doses of chromium compounds was definitely toxic.—D. BRARD. *J. pharm. chim.*, 20 (1934), 549; 21 (1935), 5. (M. M. Z.)

Cinchophen Poisoning. The author states that with proper precautions cinchophen can be taken safely. He advises taking the drug after meals with sodium bicarbonate and water. In cases where idiosyncrasies to cinchophen exist, gastric disturbance and loss of appetite are symptoms of intolerance. The drug should not be given for more than three days in succession each week unless tolerance is established. The author rarely gives cinchophen if the blood uric acid is below 4 mg. per cent; since he believes that this provides an additional margin of safety. A case is cited in which a woman had taken cinchophen almost continuously for 12 years, with one dose being more than she could tolerate during the period. The administration of cinchophen was stopped until the woman recovered and then was continued with no harm to the liver.—G. EVANS. *Brit. Med. J.*, 1 (1935), 35. (S. W. G.)

Codeine Addiction. Three cases of codeine addiction in which withdrawal symptoms were noted after removal of the drug are reported. In two of the cases paregoric and morphine had been taken previously, but the period of time intervening should eliminate the possibility of crossed tolerance. The third case had no previous history of drug taking.—D. SLIGHT. *Can. Med. Assoc. J.*, 32 (1935), 69. (S. W. G.)

Emetine—Toxic Effects of. Despite all precautions, emetine used in the treatment of amebiasis produced untoward effects. Emetine attacks all tissues and is therefore a general protoplasmic poison; changes in the kidney, liver, heart and skeletal muscles are identical, all showing hyperemia, cloudy swelling and degeneration of the cells. The immediate toxic dose for human adults is not known. Fatal results are to be feared with doses of 0.6 Gm.; anything over 1.2 Gm. is probably immediately fatal. When a therapeutic dose is injected, there is no general disturbance or gastro-intestinal symptoms; local reaction is usually slight when the solution is neutral. Larger doses cause nausea, vomiting and diarrhea. These symptoms are also apparent with small repeated doses, which may also cause vertigo, extreme muscular weakness and expiratory dyspnea; the pulse rate is slow at first and then rapid. Death results from exhaustion, gastroenteritis or inter-current inflammation of the lungs. Among the serious symptoms are increased pulse-rate, listlessness and cardiac and mental depression. There may be leg weakness, muscular tremors, globus hystericus, cardiac arrhythmia, low blood pressure, edema, petechial hemorrhage, purpuric skin rash, hemoptysis, signs of cerebral edema, albuminuria, polyneuritis, difficulty in swallowing and a feeling of constriction in the throat and chest. Recent investigation indicates that the drug is not a causative factor in abortion. It is generally advisable not to give the drug during menstruation.—R. N. CHOPRA. *Indian Med. Gaz.* (June 1934); through *J. Trop. Med. Hyg.*, 38 (1935), 15.

Lead—Biochemical Behavior in Body. A review of pertinent literature covering the last 10 years. The absorption, mode of transport in the blood, sites of deposition or accumulation, influence upon bone metabolism and structure, and mode and rate of excretion of lead are presented. —J. C. AUB. *J. Am. Med. Assoc.*, 104 (1935) 87. (M. R. T.)

Lead—Normal Absorption and Excretion of. By suitable analysis of the food consumed and the excreta (urine and fæces) of nine normal humans the daily normal lead intake was approximately 0.25 mg. and the amount excreted daily was, within the limits of experimental error, the same. Cumulative effects consequently do not normally occur. Chemical methods for the

determination of lead in human excreta and blood were found to yield uniformly low results, when these results were compared with those obtained spectrographically.—R. A. KEHOE. *J. Am. Med. Assoc.*, 104 (1935), 90. (M. R. T.)

Lead Poisoning—Control of, in Workers. The author presents "a clinically proved and detailed method for the control of lead poisoning in the worker at work," based upon extensive experience with industrial lead poisoning.—E. L. BELKNAP. *J. Am. Med. Assoc.*, 104 (1935), 205. (M. R. T.)

Lead Poisoning—Epidemiology of. A discussion of the sources and prevalence of lead poisoning in humans.—A. J. LANZA. *J. Am. Med. Assoc.*, 104 (1935), 85. (M. R. T.)

Mussel Poison—Chemistry and Toxicity of. The author describes a method for the isolation of mussel poison and gives some chemical characteristics of the purified product. He found that the most poisonous preparation obtained killed mice in amounts of 1.7 gamma per gram body weight upon intraperitoneal injection. Mussel poison seems to be of a basic nature and of a relative small molecular weight. It does not give any of the color tests for alkaloids. Brieger's "Mytilotoxin" does not represent the pure toxic principle of poisonous mussels.—H. MÜLLER. *J. Pharmacol. and Exper. Therap.*, 53 (1935), 67. (E. C. L. M.)

Phenolphthalein—Accidental Overdose in a Child without Ill Effects.—A single case is reported in which a $3^1/_2$ year old boy consumed orally 48 two-grain chocolate tablets of phenolphthalein. Although the child appeared perfectly well, the mother gave an enema; following this, the bowels moved at half-hour intervals, 5 in all. Child then taken to hospital, where he vomited several times and had two more bowel movements soon after admission. No blood in stool. Temperature and pulse good. Urine passed in normal amounts and was free from albumin, sugar, casts or blood. No tests were made for phenolphthalein in the urine or fæces, but the vomitus showed a few pieces of the tablets. Complete recovery from the 96-grain dose was otherwise apparently uneventful. In the absence of information as to the amount expelled in the fæces and vomiting, the amount actually absorbed could not be estimated, and hence, the information yielded by the case is of limited value as far as the toxicity of phenolphthalein is concerned.—W. SACHS. *J. Am. Med. Assoc.*, 104 (1935), 45. (M. R. T.)

Plumbism—Recent Progress in the Treatment of. Patients suffering from chronic or subacute plumbism were "de-leaded" by the feeding of low-calcium high-phosphorous diets, the excretion rate being determined by urine and fæcal lead. Ammonium chloride, sodium phosphate or magnesium sulphate was employed to assist excretion. The procedure was found to be effective in controlling chronic plumbism or in bringing about rapid recovery from subacute plumbism.—I. GRAY. *J. Am. Med. Assoc.*, 104 (1935), 200. (M. R. T.)

Plumbism—Symptoms in Early Stages of Industrial. A review of the literature with discussion, with emphasis upon symptomatology valuable for early diagnosis of industrial lead poisoning.—R. R. JONES. *J. Am. Med. Assoc.*, 104 (1935), 195. (M. R. T.)

Somnifen Poisoning—Acute. The symptoms of acute poisoning with somnifen resemble those of the barbituric derivatives in general, with a special action on the temperature-regulating centre, causing an abrupt rise and fall of temperature. Somnifen is less toxic than veronal, and coramine is an effective antidote.—H. GLATZEL and F. SCHMITT. *Arch. exp. Path. Pharmak.*, 174 (1934), 111; through *Physiol. Abstracts*, 19 (1935), 680.

(*To be continued.*)