PHARMACEUTICAL ABSTRACTS

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ABSTRACTORS

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ANALYTICAL

Acid-Base and Oxidation-Reduction Equilibria—A Little of the Perspective of. The Nichols medal address for 1936. A general discussion of the hydrogen cell, oxidation-reduction processes, interpretation of p_H scale and chemical potential.—W. M. CLARK. *Ind. Eng. Chem.*, 28 (1936), 620. (E. G. V.)

Alcohol and Total Solids—Determination of, by Means of a Distilling Apparatus and Hydrometer. The alcohol content of alcoholic solutions such as wine can be determined as accurately with the alcoholometer as with the pycnometer or refractometer, provided the determination is carried out on the distillate, and proper precautions (which are described) are taken. The total solids also can be determined by means of the hydrometer on the residue from the distillation.—LÜCKOW. *Mitt. Abt. Trinkbranntw. Inst. Gär. Berlin*, 25 (1935), 31–32; through *Chimie & Industrie*, 35 (1936), 927. (A. P.-C.)

Alcohol—Titrimetric Determination of, with Dichromate. Using a modification of the micro-method of Widmark, ethyl alcohol can be determined in 0.5 cc. of suitably diluted alcoholic liquids (*e. g.*, liquors obtained during vinegar manufacture, wines). As modified, the method is more convenient in practice than, and gives results agreeing closely with, the pycnometric method.—H. KREIPE. *Z. Spiritusind.*, 58 (1935), 228; through *J. Soc. Chem. Ind.*, 54 (1935), B., 872. (E. G. V.)

Alcohols—Reagents Used in the Identification of. As a reagent for the identification of alcohols the authors state that 2,4,6-trinitrobenzoylchloride renders with alcohols, esters which melt from 50–70° higher than 3,5-dinitrobenzoic acid esters which are usually used in the identification. Furthermore it is itself insoluble in boiling water, so that a small amount of water during the reaction will not interfere in identifying the alcohols. The following compounds were obtained using the identification method. *2,4-Trinitrobenzoic Acid.*—Through oxidation of technical trinitrotoluol with sodium dichromate and sulfuric acid. *Chloride:* Acid heated with phosphorus pentachloride until dissolved, boiled for 2–3 minutes, filtered through Gooch crucibles and the product obtained immediately used. Two cc. of the alcohol and 0.5 Gm. of the chloride are boiled for 20 minutes; crystals will separate out from the alcoholic solution. *2,4,6-Trinitrobenzoic Acid Esters.—Methyl ester:* separates in orange-yellow flakes, m. p. 160–161°; *ethyl ester:* orange-yellow flakes, m. p. 156–157°; *n-propyl ester:* white flakes, m. p. 154–155°; *n-butyl ester:* white flakes, m. p. 125–126°; *isobutyl ester:* m. p. 127–128°; *n-amyl ester:* m. p. 124–125°; *isoamyl ester:* m. p. 134–135°; *n-hexyl ester:* m. p. 129–130°; *isohexyl ester:* m. p. 139–140°; *n-heptyl ester:* m. p. 127–128°; *n-octyl ester:* 125–126°; *secondary octylester:* m. p. 148–149°; *n-nonyl ester:* m. p. 124–125°; *n-decyl ester:* m. p. 123–124°; *allyl ester:* m. p. 146–147°; *benzyl ester:* m. p. 176–177°.—MING CHE CHANG and C. H. KAO. *J. Chin. Chem. Soc.*, 3 (1935), 256; through *Chem. Zentr.*, 107 (1935), 122. (G. B.)

Alkaloid-Free Yellow Lupins—Chemical Examination of. Methods for determining sparteine and lupinine are described, and values obtained for sweet and bitter lupins are recorded.—F. E. NOTTBOHM and F. MAYER. *Landw. Jahrb.*, 81 (1935), 1; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1068. (E. G. V.)

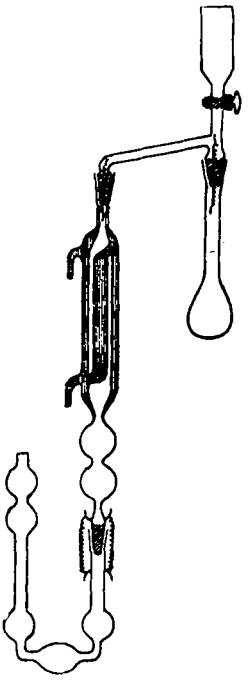
Alkaloids—Determination of, in Belladonna Leaves. The method described in D. A. B. VI gives high values due to a complete elimination of volatile bases from the ether extract, and to formation of emulsions of the extract with 0.1*N* hydrochloric acid; these sources of error are avoided by shaking the extract twice with talc, and by distilling off $^2/_3$ of its ether content before extraction of alkaloids.—N. A. VALJASCHKO, R. O. REGILJANT, M. M. SERGUTINA and Z. V. SOVA. *Ukrain. Chem. J.*, 9 (1934), 348; through *J. Soc. Chem. Ind.*, 54 (1935), B., 748. (E. G. V.)

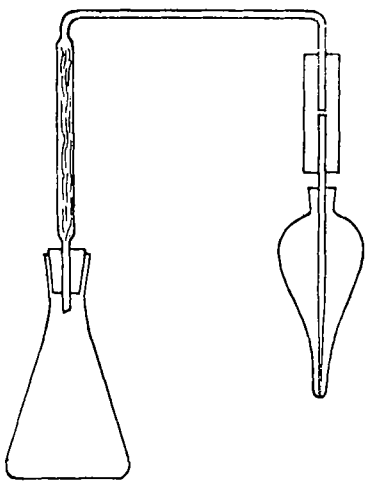
Allantoin—Colorimetric Determination of. A method for determining allantoin in urine consists of treating urine containing potassium cyanide with diastases of *Soja hispida* to destroy the urea and convert the allantoin to allantoic acid. The latter is then determined colorimetrically by heating 2 cc. of allantoic acid solution and 2 drops of 1% phenylhydrazine hydrochloride solution in a 20-cc. volumetric flask for 2 minutes on a boiling water-bath, cooling rapidly under running water, adding 1.2 cc. concentrated hydrochloric acid and 2 drops of 5% $K_4Fe(CN)_6$, making up to 20 cc. and measuring the resulting color in a colorimeter. In the dark, the color is stable for half an hour. The maximum error is 2%. If the urine contains chloroform as a preservative but no cyanide, the action of uricase is inhibited by addition of potassium cyanide. If

the urine contains $Hg(CN)_2$, eliminate the uric acid by $Hg(HSO_4)_2$, precipitate the excess mercury by hydrogen sulfide, filter and then let ferment.—GILBERTE MOUROT. *Bull. soc. chim. biol.*, 17 (1935), 1845; through *Squibb Abstract Bull.*, 9 (1936), A-221.

Arsenic—Determination of, in Wines. Wine is evaporated to a syrup and mixed with magnesium oxide. The mass is calcined, and treated with hydrochloric acid and potassium chlorate to oxidize sulfides or phosphides. The residue is twice distilled with 50% hydrochloric acid containing ferrous chloride, and arsenic in the distillate is then titrated with standard iodine-potassium iodide solution.—L. LAURENT. *Ann. Chim. Analyt.*, [iii], 17 (1935), 263; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1016. (E. G. V.)

Arsenic—Quantitative Determination of Small Quantities of, in Organic Material. The following directions are given for the decomposition of the organic substance: To 8–10 Gm. of material in a 250-cc. arsenic-free Kjeldahl flask are added with cooling 2 cc. of concentrated sulfuric acid, and then slowly 5 cc. of concentrated nitric acid. After the first energetic reaction subsides the mixture is heated. When the mixture becomes brown, it is allowed to cool and an additional 5 cc. of sulfuric acid are added, the treatment being repeated in this manner until the mixture is colorless. It is then concentrated to a few ccs. and with the aid of a little water is transferred, together with 30 cc. of saturated ammonium oxalate solution, to a 100-cc. Kjeldahl flask. To decompose the nitrosylsulfuric acid formed, the mixture is heated to the appearance of sulfur trioxide fumes and then ten minutes longer. The arsenic is converted to trichloride, since in this form it may be separated readily from the decomposed organic residue by the use of a special apparatus designed for this purpose. The capacity of the Kjeldahl flask shown in the diagram is 100 cc.; that of the bulbs attached to the condenser, 75 cc. By placing the receiving end of the apparatus in ice-water, distillation proceeds quantitatively and absorption is complete. The distillation is conducted in the following manner: The contents of the Kjeldahl flask are diluted to 20 cc. with water, a fragment of clay, boiled in hydrochloric acid, is added and 50 cc. of arsenic-free hydrochloric acid (D = 1.18) are then allowed to run in slowly from the dropping funnel. The mixture is heated moderately and distillation continued as before until about 40 cc. of liquid remain in the distillation flask. The distillate is transferred with an equal volume of wash-water to a 200-cc. Erlenmeyer flask. The arsenic trichloride is reduced according to the principle of C. R. Smith (U. S. Dept. Agriculture, Bureau of Chemistry, Circular 102 (1912)) to arsine, which is absorbed in a solution of mercuric chloride and titrated with iodine solution. The apparatus for the reduction consists of a 200-cc. Erlenmeyer flask attached by a rubber stopper to a delivery tube which is filled with waste moistened with 5% lead acetate solution for the removal of hydrogen sulfide (*cf.* diagram). The delivery end of the tube is attached by means of pressure tubing to another glass tube drawn out to 1–1.5 mm. at the lower end. A pear-shaped bulb with a ground-in stopper is used for the absorption of the arsine. The absorption fluid consists of 20 cc. of a 0.2% mercuric chloride solution. For the determination, the Erlenmeyer flask containing the arsenic trichloride solution is placed for 1/4 hr. in ice-water. Fifteen grams of arsenic-free bar-zinc are then added and the flask connected with the apparatus. When the evolution of hydrogen diminishes the ice-water is removed. The





arsine passes over completely within 5 hrs. The solution in the receiver is buffered with a Lunge-Berl phosphate mixture (p_H = 7), 10 cc. of 0.005*N* iodine solution are added and the excess iodine titrated within $^1/_2$–2 hrs. with 0.005*N* thiosulfate solution, using freshly prepared starch solution as indicator. As a control 10 cc. of iodine solution in 20 cc. of the sublimate solution are titrated with thiosulfate. 1 cc. of 0.005*N* iodine corresponds to 46.89 mg. of arsenic.—K. WINTERFELD, E. DORLE and C. RAUCH. *Arch. Pharm.*, 273 (1935), 457. (L. L. M.)

Ascorbic Acid—Estimation of, by Titration. The authors describe a number of modifications of the existing titration method for the determination of ascorbic acid, using 2:6-dichlorophenolindophenol, which render the estimation more accurate. The use of mercuric acetate for the removal of interfering plant pigments is deprecated and, instead, separation is effected by extraction of the aqueous solution with chloroform, in which the indicator is readily soluble, while most plant pigments remain in the aqueous phase. The titration is conducted upon the water-chloroform mixture, agitation of the liquid being produced by a stream of carbon dioxide. It is shown that vegetable tissues do not appear to possess any mechanism for stabilizing ascorbic acid, whereas animal tissues show a marked ability to inhibit ærobic oxidation of this substance. Several vegetables show an increased content of ascorbic acid, as determined by titration, after heating for a short time, or following acid hydrolysis, and it is suggested that this increase is due to the liberation of ascorbic acid from a compound which is soluble in water but insoluble in the solution of trichloracetic acid used for extraction.—E. W. MCHENRY and M. GRAHAM. *Biochem. J.*, 29 (1935), 2013; through *Quart. J. Pharm. Pharmacol.*, 9 (1936), 138. (S. W. G.)

Benzoic Acid—Determination of Small Quantities of. The benzoic acid is first nitrated and converted to *m*-aminobenzoic acid, then it is diazotized and coupled with naphthol. The shade produced is then matched against the solution of a given dyestuff previously standardized for known amounts of benzoic acid.—E. B. JOHNSON. *J. Soc. Chem. Ind.*, 55 (1936), 109T. (E. G. V.)

Burette for Potentiometric Titrations. The tapered end of the stop-cock of an ordinary burette is cut off and a piece of glass tubing of the desired length sealed in its place; the tubing is bent through an angle of about 60° below the seal and near the end bent back to the vertical, drawing off the end to give a tapered point. Using this burette the stop-cock can be controlled at a comfortable distance from any encumbering mechanism over the reaction vessel.—L. S. KEYSER. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 82. (E. G. V.)

Carbon—Volumetric Determination of, in Vegetable Matter. This is an application of vegetable matter to J. F. Durand's method. Grind the material to pass a 60-mesh sieve; to 10 to 60 mg. (depending on the intensity of the reaction) in an Erlenmeyer flask add 7 to 8 cc. of 66° Bé. sulfuric acid, add drop by drop about 5 cc. of a solution obtained by grinding in a mortar an excess of potassium permanganate with 20 cc. of sulfuric acid and 2% of water, place the flask in the apparatus, adjust the levels to zero, mix the liquids by inverting the flask, shake to facilitate evolution of the last traces of carbon dioxide, again adjust the levels after 10 to 12 min., read the volume and make the usual corrections. The error is of the order of 0.1 to 0.2 mg., or about 1 to 2% for a 10-mg. sample. The method is not applicable to certain substances (urea, propionamide, asparagine) which do not liberate any gas under these conditions.—J. DULAC and A. BOUAT. *Ann. Ecole Nat. Agr. Montpelier*, 23 (1935), 194–196; through *Chimie & Industrie*, 35 (1936), 944. (A. P.-C.)

Chlorine—Rapid Determination of Traces of Active, in Water. Chlorine is determined colorimetrically by adding a crystal of potassium bromide to a 50-cc. sample. The liberated bromine gives a violet color on adding 1 cc. acetic acid and 1 cc. of aqueous fuchsin [10 cc. of 0.1% aqueous fuchsin in 100 cc. of sulfuric acid (1:20)]. The determination is applicable to concentrations of 0.005–0.7 mg./liter. Organic matter does not interfere.—L. LEROUX. *Compt. rend.*, 199 (1934), 1225; through *J. Soc. Chem. Ind.*, 54 (1935), B., 208. (E. G. V.)

Cinchona—Iodized Fluidextract of. A description of the determination of alkaloids in fluidextract of cinchona and of alkaloids and iodine in iodized fluidextract of cinchona.—C. STAINIER and A. DUPUIS. *Congrès de Pharmacie (Liège 1934)*, (1935), 188–192; through *Chimie & Industrie*, 35 (1936), 891–892. (A. P.-C.)

Cod Liver Oil—Iodine Content of American. Values range between 3,590 and 14,940 units per billion of oil. Samples from Nova Scotia, Gespé and Newfoundland contained more iodine than those from Maine or regions where deep-sea fish were available.—A. D. HOLMES and R. E.

REMINGTON. *Amer. J. Dis. Children*, 49 (1935), 94; through *J. Soc. Chem. Ind.*, 54 (1935), B., 859. (E. G. V.)

Cod Liver Oil—Oxidation of, and Rapid Determination of the Antioxidant Action of Substances. The antioxidant action of guaiacol, maleic acid and mannitol is measured in terms of acid production on heating the oil in oxygen at 75° and 100° in presence and absence of the substances.—M. MOTTIER. *Arch. sci. phys. nat.*, 16 (1934), 122; through *J. Soc. Chem. Ind.*, 54 (1935), B., 733. (E. G. V.)

Copper—Determination of, in Pharmaceutical Specialties Containing Copper and Iron. Organic matter is destroyed by evaporation with concentrated sulfuric acid, the residue is dissolved in hot water, and citric acid (a 5-fold excess for the iron present) and aqueous ammonia (5.10 cc. in excess) are added to the filtered solution. The mixture is then shaken with 20 cc. of a 0.5% solution of diphenylthiocarbazone in chloroform, the chloroform extract being washed with water, filtered, distilled to remove chloroform and the residue heated with concentrated sulfuric acid and fuming nitric acid. The residue is heated with saturated ammonium oxalate, diluted with water, potassium iodide, potassium thiocyanate and starch solution are added, and the liberated iodine is titrated with sodium thiosulfate.—E. KALLSTROM. *Svensk Farm. Tid.*, 38 (1934), 185; through *J. Soc. Chem. Ind.*, 54 (1935), B., 523. (E. G. V.)

Corrosive Sublimate—Volumetric Determination of, with Lead Sulfide. Mercuric chloride is boiled for 15 minutes with an excess of an aqueous suspension of lead sulfide. The liquid is filtered hot, and lead chloride in the filtrate and washings is titrated with sodium carbonate using phenolphthalein.—N. A. TANANAEV and V. D. PONOMARJEV. *Z. anal. Chem.*, 101 (1935), 185; through *J. Soc. Chem. Ind.*, 54 (1935), B., 628. (E. G. V.)

Creams—Method for the Measurement of Certain Mechanical Properties of Pharmaceutical and Technical. Attention is directed to the fact that some substances lend themselves to massage while others do not. Olive oil is excellent while lanolin makes a sticky film. Skin creams that have plant mucilages for base act in an entirely different manner, showing first a wetting, then stickiness, then smoothness. This peculiar phenomenon was responsible for this study. An apparatus was devised for determining "sliding ability." This is carefully described and also illustrated and the experimental work is reported in detail. Pure liquids tested were oleic acid, glycerol, paraffin oil, vaseline and lanolin; also creams of the type "water in oil" and creams of the type "oil in water." A few examples are illustrated with curves.—JOHN URI LLOYD, WOLFGANG OSTWALD and HANS ERBRING. *J. Am. Pharm. Assoc.*, 25 (1936), 386. (Z. M. C.)

Diastatic Strength—Determination of. A rapid volumetric procedure is described for determining the sugar formed by diastases. The method was standardized with taka-diastase; its applicability to malt- and animal-diastase requires it to be checked.—R. IRVIN. *Cereal Chem.*, 12 (1935), 142; through *J. Soc. Chem. Ind.*, 54 (1935), B., 650. (E. G. V.)

Digitalin—Analysis of Spanish. A sample of ordinary commercial material contained 0.052% of crystalline digitalin (calculated on dry leaves), and a sample from Salamanca 0.085%.—F. GIRAL. *Anal. Fis. Quim.*, 31 (1933), 746; through *J. Soc. Chem. Ind.*, 54 (1935), B., 380. (E. G. V.)

Endrine—Investigation of. Endrine, a product of the Petrolagar Laboratories, Limited, London, contains, according to the label, ephedrine 0.75%, menthol 0.5%, camphor 0.5%, eucalyptol 0.5% and liquid paraffin *q. s.* The author describes methods for analysis for this preparation, including the quantitative determination of ephedrine and of volatile material and also describes several identity color reactions. A mixture, made according to the above proportions, analyzed as follows: ephedrine hydrochloride 0.7455%; volatile material 1.46% and identification reactions positive. A bottle of Endrine from the open market analyzed as follows: ephedrine hydrochloride 0.66%; volatile material 1.68%; identification reactions positive.—H. J. VAN GIFFEN. *Pharm. Weekblad.*, 73 (1936), 526. (E. H. W.)

Epinephrine—Quantitative Colorimetric Estimation of, by Ammonium-o-Iodoxybenzoate. The color reaction between free phenolic hydroxyl groups and ammonium-*o*-iodoxybenzoate has been shown to be applicable to the quantitative estimation of morphine. Studies with a Pulfrich photometer have indicated the conditions under which the reagent may be used for the quantitative colorimetric estimation of epinephrine. The transmission curve of the pink oxidation product shows little absorption in the red or orange regions of the spectrum, but rapidly increasing absorption through the yellow and green to reach a maximum about 4900 Å, after which it decreases

again in the blue and violet. The color formation in an excess of ammonium-*o*-iodoxybenzoate follow the Lambert-Beer Law in dilutions of epinephrine from 1:20,000 to 1:240,000. Estimations may be made by adding to appropriately dilute solutions of epinephrine an equal volume of a 2% aqueous solution of ammonium-*o*-iodoxybenzoate, and, after allowing to stand for a half hour, comparing in a colorimeter with an epinephrine solution of known concentration. The applications of this method to biological fluids are being investigated.—C. R. MOODEY and C. D. LEAKE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 136. (H. B. H.)

Ergot—Chemical Assay of. The method is as follows: Extract 10 Gm. of ergot in moderately fine powder with light petroleum (b. p. 40–50° C.) in a continuous extraction apparatus until defatted. Dry the extracted drug at a temperature not exceeding 40° C. and transfer to a porcelain dish. Add sufficient anæsthetic ether to form a semi-liquid mass, then add 2 cc. of strong ammonia and stir with a glass rod. Allow most of the ether to evaporate, return the residue to the extraction apparatus and exhaust with 100 cc. of anæsthetic ether, the extraction being continued for 5 hours. Filter the ethereal liquid through a small filter and wash the flask and filter with small quantities of anæsthetic ether until a total volume of 120 cc. is obtained. *Total Alkaloids.*—Shake 60 cc. of the ethereal solution with successive quantities of 10, 10, 5 and 5 cc. of a 1% w/v solution of tartaric acid. Mix the acid solutions and warm gently in a current of air. Cool and dilute to 30 cc. with water. Mix 1 cc. with 2 cc. of solution of dimethylaminobenzaldehyde (0.125 Gm. dimethylaminobenzaldehyde, cooled mixture of 65 cc. of sulfuric acid and 25 cc. of water, 0.1 cc. of test solution of ferric chloride) and allow to stand for 5 minutes. Mix 1 cc. of solution of ergotoxine ethanesulfonate (B. P., 1932) with 2 cc. of solution of dimethylaminobenzaldehyde and allow to stand for 5 minutes. Determine the ratio of the color intensities by comparing them in a suitable colorimeter. *Water-Insoluble Alkaloids.*—Shake the remaining 60 cc. of ethereal solution with successive quantities of 20 cc. of water, made faintly alkaline to litmus with ammonia, until 1 cc. of the separated aqueous liquid gives no blue color when mixed with 2 cc. of solution of dimethylaminobenzaldehyde. Shake the ethereal solution with successive quantities of 10, 10, 5 and 5 cc. of a 1% w/v solution of tartaric acid. Mix the acid solutions and remove the ether by gentle warming in a current of air. Cool, dilute to 30 cc. with water and compare with solution of ergotoxine ethanesulfonate as described above. The water-soluble alkaloids may be obtained by subtracting the two results obtained above. In all these cases the alkaloids are calculated as ergotoxine. From the proportion of water-soluble alkaloids obtained the conversion to ergometrine is made by multiplying by the factor 0.538; in this result any ergometrinine which may be present is included. Glyoxylic acid offered no advantage over *p*-dimethylaminobenzaldehyde as a reagent for the colorimetric determination of ergot alkaloids.—C. H. HAMPSHIRE and G. R. PAGE. *Quart. J. Pharm. Pharmacol.*, 9 (1936), 60–74. (S. W. G.)

Extraction Apparatus—Efficient Laboratory. A modified Soxhlet-type extractor is illustrated. A 7-liter percolator of the Oldberg type is used and an internal condenser is provided which cools and liquefies nearly all vapors before they pass into the percolator.—F. C. OPPEN. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 110. (E. G. V.)

Fat Emulsions—Use of the Quinhydrone Electrode with. The unequal distribution of quinone and quinol between the fat and water causes errors when the quinhydrone electrode is used, for which corrections are given.—A. UNMACK. *Kong. Vet.-Landsb. Aarskr.* (1934), 175; through *J. Soc. Chem. Ind.*, 54 (1935), B., 508. (E. G. V.)

Fats—Saponification Curve of, in Alcoholic Solutions and Its Importance for Analytical Evaluation of Fats. In the first stages of saponification the reaction curve is neither that of a unimolecular nor a bimolecular reaction, but after 90 minutes at 18°, or 10 minutes at 30°, the reaction became strictly bimolecular. This is due either to alcoholysis, or to the more rapid saponification of glycerides of low molecular weights. A practical method is described for detection of adulteration by determining the fall in conductivity in 20 minutes of the fat–alcohol–potassium hydroxide system at 30°. Fats rich in propionic acid, $C_{11}H_{23}COOH$, $C_{13}H_{27}COOH$, or saturated acids are more rapidly saponified than those rich in palmitic and stearic acids. High acidity results in a lower rate of saponification.—R. STROHECKER. *Z. Unters. Lebensm.*, 69 (1935), 521; through *J. Soc. Chem. Ind.*, 54 (1935), B., 858. (E. G. V.)

Fats and Oils—Degree of Unsaturation and Composition of, Kaufmann's Thiocyanogen Method for Determination of. The method of deducing the composition of the oil from its

iodine value, thiocyanate value and % of saturated acids is described.—A. KRAEFF. *Verfkroniek*, 8 (1935), 159; through *J. Soc. Chem. Ind.*, 54 (1935), B., 683. (E. G. V.)

Fats and Oils—Melting Points of, New Method for Determination of. The molten fat or oil is drawn into the bend of a capillary U-tube and cooled in ice for 2 hours. The tube is then placed in a water-bath at an angle of 45° so that one end (suitably bent and lengthened) is in air and the other (2 cm.) is under the water surface. The temperatures at which slip is first observed and at which 5 mm. movement of the column has taken place are recorded as the limits of melting point. Comparison results with the Grün and Polenske methods, and the melting points of the body fat of 30 invertebrate animals, are given.—H. MIELLER. *Z. Unters. Lebensm.*, 69 (1935), 73; through *J. Soc. Chem. Ind.*, 54 (1935), B., 416. (E. G. V.)

Fats and Their Mixtures—Titre of Solids. Finkner's method, consisting in determining the freezing points of the acids obtained by hydrolysis of fats, is the most trustworthy. A modified apparatus is described, together with detailed directions for its use. The freezing point varies with time elapsing after preparation of the acids, in particular when these are exposed to damp air, and falls, even when atmospheric influences are excluded, with repeated fusion.—A. Koss. *Przemysl Chem.*, 19 (1935), 75; through *J. Soc. Chem. Ind.*, 54 (1935), B., 683. (E. G. V.)

Fatty Oil Research—Application of Absorption Spectra in. I. II. The absorption spectra for the range 200–330 mμ for solutions of a number of constituents of oils in hexane have been determined, in order to serve as a basis for analytical work. Conjugated double linkings, as in the linoleic acids, produce highly characteristic maxima. Results for elæostearic acids, methyl ricinoleate, stearolic and elaidic acid are also recorded. The results are applied to the quantitative analysis of castor oil, sesamé and palm oils, also tung oil and its hydrogenated products. The spectrum of palm oil is practically identical with that of carotene. The curve for tung oil hydrogenated under high pressure shows no maximum at 230 mμ, whence it is concluded that it contains no linoleic acid, elæostearic acid being transformed directly into oleic and stearic acids; at high temperatures and one atmosphere linoleic acid is formed in quantity.—L. J. N. VAN DER HULST. *Rec. trav. chim.*, 54 (1935), 639, 644; through *J. Soc. Chem. Ind.*, 54 (1935), B., 912. (E. G. V.)

Fig Seed Oil—Physical and Chemical Constants of. Seeds contain 23.5% of oil (5.7% in seed from dried figs), density 0.929, saponification value 4.35, Reichert-Meissl value 1.04, Polenske value 1.52, iodine value 147.4, Hehner value 87.3; melting point of free fatty acids 17°.—A. PAIZI. *Praktika*, 9 (1934), 164; through *J. Soc. Chem. Ind.*, 54 (1935), B., 859. (E. G. V.)

Fixed Oils—New Constant for. Hypochlorous Acid Value. The oil is saponified with potassium hydroxide and the saponification value determined by hydrochloric acid (bromthymol blue). Sodium hypochlorite is added, followed by just sufficient sulfuric acid to liberate hypochlorous acid and neutralize free sodium carbonate. The hypochlorous acid is determined by potassium iodide-sodium thiosulfate.—M. GOSWAMI and K. L. BASU. *J. Indian Chem. Soc.*, 11 (1934), 905; through *J. Soc. Chem. Ind.*, 54 (1935), B., 365. (E. G. V.)

Gelatin Gels—Measurement of the Strength of Dilute. An apparatus for the determination of the gel strength of weak gels is described, the principles of the determination being the measurement of the stress required to produce a standard strain in an annular ring of the jelly. Over a limited range of concentration the strength at any time bears a linear relationship to the square of the concentration of gelatin. Acid appears to form a compound with the gel, thus affecting its strength.—L. H. LAMPITT and R. W. MONEY. *J. Soc. Chem. Ind.*, 55 (1936), 88T. (E. G. V.)

Glycerin—Detection of. The oxidation of glycerin with permanganate in phosphoric acid solution gives glyceric aldehyde, which may be detected by its reaction with chromatropic acid in concentrated sulfuric acid solution to give a green fluorescence. This reaction is also given to some extent by other polyvalent alcohols. The following test is based on the oxidation to dihydroxyacetone and conversion of the latter to pyrotartaric aldehyde. Two drops of the solution to be tested are placed in a test-tube which is then filled with bromine vapor, covered and heated for 10 minutes at 85° to 90° C. The cover is removed, heating is continued for 15 minutes, and a crystal of sodium sulfite is added to remove all traces of bromine. Two to 3 cc. of sulfuric acid are added carefully, with simultaneous cooling, followed by a small amount of solid metahydroxybenzoic acid. The mixture is heated for 15 minutes at 65° to 70° C. A green fluorescence shows the presence of glycerin. The sensitivity is 5 micrograms in 0.05 cc. of solution,

which is about ten times as sensitive as the epihydrin aldehyde-phloroglucinol and the dihydroxyacetone-naphthol reactions. The reaction can be observed in the presence of six times the amount of glycol or glucose, or twice the quantity of sucrose, but levulose causes more interference.—E. EEGRIWE. *Z. anal. Chemie* (1935), 31; through *Quart. J. Pharm. Pharmacol.*, 9 (1936), 118. (S. W. G.)

Gold Sol—Preparation of. The author found that in preparing colloidal gold solution for the Lange reaction, he often did not obtain the ruby-red solution required. Investigation showed that distilled water containing a trace of tin (distilled through tin condensers) gave a satisfactory solution while that distilled from glass apparatus gave an unsatisfactory result. The following method gives satisfactory results. Double distilled water is prepared, the second distillate being caught in a 500-cc. flask in which a tin stick (10 cm. long and 9 mm. in diameter) is immersed. 250 cc. of this double distilled water is placed in a 500-cc. Jena flask (previously cleaned with aqua regia, rinsed and steamed) and boiled. During the warming 2.5 cc. of a 1% aurum chloratum flavum Merck, 2.65 cc. of 0.2*N* (1.38%) potassium carbonate solution and 0.125 cc. of 1% oxalic acid are added. Take the flask immediately from the flame and add, with vigorous rotation, 3 cc. of 1% formaldehyde solution. The chemicals should be pure. The distillation of the water should require 45 to 60 minutes. If it is necessary for certain reactions to have a higher concentration of potassium carbonate, more of this chemical may be added to the finished solution.—A. C. HONIG. *Pharm. Weekblad*, 73 (1936), 614. (E. H. W.)

Hexamethylenetetramine—Analysis of. A 1-Gm. sample is refluxed for 15 minutes with 200 cc. of water and 50 cc. of 10% hydrochloric acid and diluted to 1 liter. To 25 cc. of this solution are added 26 cc. of a filtered solution of mercuric chloride (5%), potassium iodide (15%) and gum arabic (2.5%) and 13 cc. of a filtered solution containing mercuric chloride (10%), potassium iodide (30%), gum arabic (5%) and potassium hydroxide (15%). The mixture is stirred for 6 minutes, and 12.5 cc. of 40% acetic acid and 25 cc. of 0.1*N* iodine are added, excess iodine being titrated with 0.05*N* sodium thiosulfate.—S. MINATOYA and I. NAGAI. *J. Soc. Rubber Ind. Japan*, 7 (1934), 337; through *J. Soc. Chem. Ind.*, 54 (1935), B., 181. (E. G. V.)

Hexamethylenetetramine—Determination of. *Apparatus.*—A special vacuum pipette (*J. pharm. chim.*, 19 (1934), 156) connected with a condenser and a 500-cc. Erlenmeyer flask. *Method for Formaldehyde.*—Introduce by the upper tube (T_1) 18 cc. of Nessler's reagent and then 2.5 cc. of barium sulfate suspension to form a vacuum of 15–18 mm. mercury. Introduce, by means of the stop-cock on the safety tube, 5 cc. of solution of hexamethylenetetramine (20%), then about 10 cc. of distilled water and finally 1 cc. *N* sulfuric acid. Heat at 80° C. for 10 minutes. Distil almost to dryness, then add to the Erlenmeyer 10 cc. of distilled water and then 6 portions of 5 cc. of distilled water, distilling each portion with occasional agitation of the flask. When the distillation has been completed, the stop-cock is opened to reëstablish atmospheric pressure, the rubber tube and pinch clamp is removed from the end of tube (T_1). Introduce hydrochloric acid (1:2) to acidify (about 10 cc.) through the opening T_1, then add 20 cc. of *N*/20 iodine. Stop the flow of water and remove the rubber tubes. Separate the flask and shake from time to time to aid in redissolving the reduced mercury. After 4–5 minutes transfer quantitatively the contents of the flask into a 500-cc. flask and, when the precipitate is completely dissolved, titrate the excess iodine with *N*/20 thiosulfate, using starch indicator. The amount of hexamethylenetetramine in the sample is given by the equation: $X = \frac{(20 - n)3.5}{6}$ in mg.; in which n represents the number of cc. of thiosulfate used (theoretically n = 2.86). *Method for Ammonia.*—Introduce into the special pipette exactly 20 cc. of *N*/50 sulfuric acid. Add 2 drops of phenolphthalein solution to the mixture in the Erlenmeyer flask, adapt the pipette to the flask and form the vacuum as above. Add the baryta water slowly by means of the stop-cock until the mixture is just alkaline. Heat to about 80° C. and start the water through the condenser. Distil almost to dryness, add 10 cc., then 6 times 5 cc. of distilled water to the mixture in the Erlenmeyer flask and distil each portion. Stop heating, allow atmospheric pressure to be established and separate the special pipette. Transfer quantitatively the distillate into a 500-cc. Erlenmeyer flask and boil to remove carbon dioxide. Cool, add 2 drops of neutral red solution and titrate the excess sulfuric acid with *N*/50 sodium hydroxide. If n = the number of cc. of base used, the amount of hexamethylenetetramine in the sample may be obtained from the relation X = (20 − n) 0.7 mg. (theoretically

n = 5.71 cc.). The maximum error was 2%.—RAOUL GROS. *J. pharm chim.*, 22 (1935), 241–243. (S. W. G.)

Honey—Differentiation of Natural and Synthetic. The ultraviolet absorption spectrum (I) of natural honey (II) rises smoothly from λ380 to λ220 mμ, while that of synthetic honey (III) has a sharp maximum at λ282.5 mμ, due to hydroxymethyl-furfuraldehyde (IV). The % of (IV) can be determined and adulteration of (II) with (III) can be detected by examination of (I). Samples of (III) contained approximately 1% of (IV) while invert sugar contained approximately 5%.—S. A. SCHOU and J. ABILDGAARD. *Z. Unters. Lebensm.*, 68 (1934), 502; through *J. Soc. Chem. Ind.*, 54 (1935), B., 378. (E. G. V.)

Insulin—New Method for Precipitating and Determining Purity of. Insulin is removed quantitatively from aqueous solutions as a bluish precipitate by the addition of 0.2% potassium ferrocyanide solution. For very pure insulin about 0.1 mg. of ferrocyanide is required to precipitate 100 units; commercial insulin requires from 0.6 to 2 mg., since other substances present are also precipitated. The filtrate, in all cases, contains inactive protein derivatives which precipitate with picric acid. Good commercial insulin containing 20 to 22 units per mg. of dry substance yields a dried ferrocyanide precipitate weighing 4 to 6 mg. per 100 units. Less refined products yield precipitates weighing 7 to 10 mg. per 100 units; hence the quality can be judged by the weight of the precipitates. The ferrocyanide precipitate (Ferrinsulin) can be dissolved in 2% sodium phosphate solution, and injected. With rabbits, its action is less marked but more prolonged than that of ordinary insulin.—I. I. NITZESCU and S. SECAREANU. *Bull. soc. chim. biol.*, 17 (1935), 118; through *Quart. J. Pharm. Pharmacol.*, 9 (1936), 134. (S. W. G.)

Invert Sugar—Detecting Small Amounts of, in Presence of Sucrose. To detect small amounts of invert sugar in presence of much sucrose, 20 cc. of the sugar solution containing 0.1–0.15 Gm. of glycine are mixed with 20 cc. of Barfoed's reagent (with only 0.5% of acetic acid) containing 2 Gm. of sodium acetate. This mixture is warmed for five minutes in a boiling water-bath.—V. MORGENSTEIN. *Centr. Zuckerind.*, 42 (1934), 824; *Internat. Sugar J.*, 37 (1935), 72; through *J. Soc. Chem. Ind.*, 54 (1935), B., 328. (E. G. V.)

Iodides—Volumetric Determination of, by Ceric Sulfate. A measured volume of the iodide solution is treated with 25 cc. of acetone, 10 cc. of 9*M* sulfuric acid, and water to make the volume 100 cc. After adding one drop of *o*-phenanthroline ferrous sulfate solution, the mixture is titrated with the ceric sulfate until the pink color of the indicator changes to a pale blue. The end-point is sharp and lasts several minutes. The rate at which the oxidant is added does not affect the results. At the start of a titration rapid addition of the ceric sulfate may cause the solution to be colored brown by free iodine, which rapidly disappears on interrupting the titration and stirring a few seconds. It is desirable to conduct the titration in flasks, since iodoacetone is a lachrymator.—D. LEWIS. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 199. (E. G. V.)

Iodine Value—Determination of. Methods are reviewed. That recommended is to shake 0.1–0.2 Gm. of the sample with 15 cc. of a 2:1 ether-dimethylketone mixture and 25 cc. of 0.2*N* iodine in alcohol, add 200 cc. of water, shake for 5 minutes and after 5 minutes titrate the excess iodine with thiosulfate.—L. SHERDEVA and G. SHIRJAEVA. *Grozn. Neft.*, 4, Nos. 6–7 (1934), 45; through *J. Soc. Chem. Ind.*, 54 (1935), B., 859. (E. G. V.)

Iodine Values—Potentiometric Determination of. One gram of fat is dissolved in 25 cc of chloroform, 3 cc. of solution are added to 15 cc. of 0.2*N* chloriodide (I) in acetic acid, and the reduction potential is compared with that found for carbon tetrachloride alone, and for a solution of known iodine value. The method is rapid (5 minutes) and accurate, and may be applied to micro-analysis. Greater accuracy is given when 2% of the oxidizing power of the (I) solution is represented by iodine.—K. DREWSKI. *Przemysl Chem.*, 19 (1935), 63; through *J. Soc. Chem. Ind.*, 54 (1935), B., 683. (E. G. V.)

Iron Salts—Volumetric Determination of Free Acid in Solutions of. Hydrogen-ion concentation is determined iodometrically by addition of excess potassium iodate with potassium iodide, and titration of the liberated iodine. Iodine liberated by ferric iron is determined separately. Potassium iodate is best added in successive small amounts during titration, to eliminate the reaction of ferrous iron with potassium iodide and potassium iodate.—E. MULLER and A. ADELSBERGER. *Z. anal. Chem.*, 101 (1935), 178; through *J. Soc. Chem. Ind.*, 54 (1935), B., 628. (E. G. V.)

Kjeldahl Method. Lemoigne, Desveaux and Monguillon have shown that digestion

should be prolonged at least 3 hrs. after complete decolorization. The time of digestion can be very appreciably shortened by appropriate use of perchloric acid; all methods of using it, however, are not suitable (*e. g.*, Yoe's procedure is unsuitable for milk and flour). By digesting for about 10 mins. by the Gunning method and then adding perchloric acid a few drops at a time during boiling, complete decolorization is effected in a few mins. and the total time of digestion can be reduced to about 30 mins. with flour and saffron, and with steam distillation the ammonia can be completely distilled in about 20 mins.—LE TOURNEUR-HUGON and CHAMBIONNAT. *Ann. Fals.*, 29 (1936), 227–229. (A. P.-C.)

Liquor Ammoniæ Anisatus—Volumetric Determination of Anise Oil in, and Other Volatile Oils in Alcoholic Solution. Kutscheroff's apparatus is described (Fig. 1) and was further simplified. The procedure for the determination of anise oil follows: Treat an accurately weighed quantity (about 5 Gm.) of the liquor with about 2 cc. of sulfuric acid (16%) to convert the ammonia into ammonium sulfate (using methyl red as an indicator). The conversion is made in the burette (h), a glass tube with inside diameter of 2 mm. provided with a cock which runs into the bent capillary (z). Bring the flask (B) (about 150 cc. capacity) into a horizontal position and allow the mixture to flow from (h) into (B), rinse (h) with saturated ammonium sulfate solution. Re-

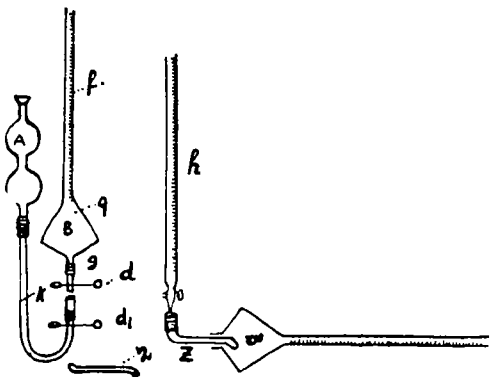


Fig. 1

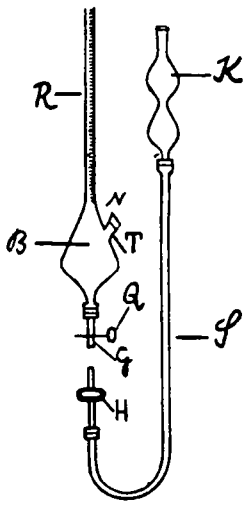


Fig. 2

move the burette and close flask (B) with a small rubber tube (g) provided with a pinch-cock (d). Attach (B) in a vertical position to (A) by means of a rubber tube (k) and glass cock (d_1). The salting out and volumetric determination is carried out as given below under Spirit of Sinapis. The apparatus in Fig. 2 was used in the following manner: Neutralize an accurately weighed sample of the liquor in a small Erlenmeyer flask with sulfuric acid (16%), introduce the mixture by the side tube (T) into the pear-shaped flask (B) (400 cc.), rinse the small flask with concentrated ammonium sulfate solution and proceed as above. The method is applicable to spirits of juniper, lavender, peppermint, rosemary and compound spirit of mellisa.—H. KAISER and E. FÜRST. *Apoth. Ztg.*, 51 (1936), 26. (H. M. B.)

Maltose—Iodometric Determination of. A rapid and convenient semi-micro method for determining maltose in studies of amylase action. Five cubic centimeters of the buffer solution (prepared by mixing 5 volumes of 0.2*M* sodium carbonate and 1 volume of 0.4*M* hydrochloric acid) are pipetted into a 250-cc. glass-stoppered Erlenmeyer flask. One cubic centimeter of the sugar solution (starch-hydrolysis mixture) to be analyzed is pipetted into the buffer solution in the flask and immediately treated with 2 cc. of 0.05*M* iodine solution which is added from a long-tipped automatic burette graduated to 0.01 cc. After gentle rotation to insure thorough mixing, the solution is allowed to stand in the tightly stoppered flask in the dark at room temperature for 30 minutes for the oxidation of the sugar. Variations in room temperature from 23° to 29° do not appreciably influence the results. The time allowed for the oxidation of the sugar is, however,

important and should be kept constant. At the end of 30 minutes, 5 cc. of 0.06*M* sulfuric acid are added from a burette in such a manner as to wash down the sides of the flask and mix gently but thoroughly with the solution. The excess iodine is immediately titrated with 0.05*M* thiosulfate which is added from an automatic long-tipped burette graduated to 0.02 cc. If no starch is present, 1 or 2 drops of a 1% starch dispersion are added as indicator. The difference between the volume of thiosulfate required to reduce 2 cc. of the original iodine solution, treated as described above, and that required for the iodine which remains after the oxidation of the sugar represents the iodine reduced by the sugar and gives the equivalent of maltose present in the solution.—M. L. CALDWELL, S. E. DOEBBELING and S. H. MANIAN. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 181. (E. G. V.)

Mercury—Microchemical Detection of, in Foodstuff and Toxicological Analysis. Mercury in wines, etc., may be displaced from solution by copper, and thence sublimed in a sealed tube into a capillary. Iodine vapor then converts mercury into mercuric iodide. Alternatively, mercury may be extracted quantitatively with ether and the ether solution treated with cobalt acetate and ammonium thiocyanate in presence of nitric acid, precipitating $CoHg(CNS)_4$. Nitric acid increases the sensitivity of the test 100 to 1000 fold. In toxicological examination, the organs may be boiled with nitric acid and tested as above.—A. MARTINI and B. BERISSO *Mikrochem.*, 16 (1935), 236; through *J. Soc. Chem. Ind.*, 54 (1935), B., 284. (E. G. V.)

Meta-Cresol—Separation of, from a Mixture of Meta- and Para-Cresols. Meta-cresol in a liquid mixture of meta- and para-cresols is combined with phenol, and the resulting solid meta-cresol-phenol compound is separated from the residual liquid fraction.—THOMAS S. CARSWELL, assignor to MONSANTO CHEMICAL CO. U. S. pat. 2,042,331, May 26, 1936. (A. P.-C.)

Methyl Alcohol—Determination of, in Ethyl Alcohol and Alcoholic Beverages. Methyl alcohol is converted into formaldehyde by oxidation with potassium permanganate. The aldehyde is determined photometrically by means of Schiff's reaction. Curves and tables are given correlating the % of methyl alcohol with the extinction coefficient when a specified procedure is carried out. The % of methyl alcohol of 5 types of spirits varied between 0.10 and 0.18%.—O. ANT-WUORINEN. *Z. Unters. Lebensm.*, 69 (1935), 59; through *J. Soc. Chem. Ind.*, 54 (1935), B., 424. (E. G. V.)

Morphine in Opium—Evaluation of Lime Methods for Determining. Some of the methods that have been used are discussed. The authors believe no method developed thus far is satisfactory. In "ammonia methods," the separation of narcotine from morphine is not sharp. In the U. S. P. X method and Rosin's method extraction is incomplete because of insufficient natural acidity of the opium. Methods that use an empirical aliquot do not take into account variable factors of the opium which affect the solution. The method proposed by the League of Nations has the faults inherent in lime methods. Morphine is carried down with the calcium meconate. The assay morphine is found to be contaminated by titratable impurities, such as by-alkaloids and calcium carbonate. Lactose raises the results. The solubility of morphine in mother liquor is variable and the correction factor adopted is arbitrary. Methods of purifying assay morphine have been various and the authors developed one from use in the present investigation. The behavior of pure morphine was first investigated. Reprecipitation procedure is explained and results tabulated. The solubility of morphine mother liquor from the lime process is shown; the effect of dissolving assay morphine in methanol was tried by two methods. The effect of adding meconic acid is shown by tables. Oxidation and the effect of pseudomorphine was determined. In the investigation of the League of Nations method, moisture content and extractives are shown. Purity of the assay morphine was determined by reprecipitation, results tabulated and the amount of unprecipitated morphine determined. Morphine in the marc was investigated. The following summary is given.

Precipitated from 25.0 Gm. filtrate	0.3467 Gm.
Dissolved in mother liquor	0.0164 Gm.
In excess liquor	0.2484 Gm.
Undissolved in marc	0.0139 Gm.
Total from 4 Gm. opium	0.6254 Gm.
Per cent morphine in opium	15.63

The difference of 0.74 per cent between this figure and 16.37 per cent, the average result of the original 9 assays, is made up of errors due to impurities in the assay morphine, incorrect solubility correction and coprecipitation of morphine in the lime marc. In studying U. S. P. X and Rosin Methods the precision of the aliquot was investigated and it was found that there is error in taking the aliquot either by volume or by weight. Purity of the U. S. P. assay morphine was studied. Impurities shown are non-phenolic alkaloids and water-soluble impurities. The important points brought out in the investigation are the following: "(*a*) Morphine is coprecipitated with calcium meconate. (*b*) The solubility correction used in the League of Nations method is approximately double the amount of morphine that can be extracted from the mother liquor, and is double the loss suffered by pure morphine when it is substituted for opium in the assay. (*c*) The assay morphine is contaminated by basic impurities, including by-alkaloids and calcium salts. (*d*) Substances such as lactose raise the assay. (*e*) Empirical aliquots are inaccurate." The study is being continued on methods based on extraction with immiscible solvents and report will be made later.—V. H. WALLINGFORD and AUGUST H. HOMEYER. *J. Am. Pharm. Assoc.*, 25 (1936), 402. (Z. M. C.)

Nitrates—Stable Colorimetric Scale for Rapid Determination of, in Waters. The determination is based on the formation of a nitrated derivative by the action of the nitric acid present in the water on phenol in the presence of sulfuric acid and on the colorimetric determination of the ammonium salt formed. *Method.*—Evaporate 10 cc. of the water to dryness in a glass dish on a water-bath. Treat 10 cc. of a solution of potassium nitrate (0.0801 Gm. KNO_3 plus enough distilled water to make 1000 cc.). Cool the residues, add 1 cc. of the sulfo-phenolic reagent (phenol 3 Gm., sulfuric acid, D = 1.84, 37 Gm.) to each, then add 5 cc. of distilled water and 10 cc. of ammonia (1:3). A yellow coloration is formed. The standard corresponds to 50 mg. of nitric acid per liter. Compare in a Duboscq colorimeter after interposition of a blue glass. A set of permanent standards is prepared as follows: Potassium dichromate (recrystd. and dried) 0.1 Gm., nickel sulfate (cryst.) 2 Gm., sulfuric acid 10 drops, distilled water to make 100 cc. Two -, 4-, 6-, 8- and 10-cc. portions of the above solution are mixed with enough distilled water to make 16 cc. of solution in each case, the solutions representing 10, 20, 30, 40 and 50 mg. of nitric acid per liter, respectively.—RAOUL GROS. *J. pharm. chim.*, 22 (1935), 244–246. (S. W. G.)

Nitrites and Nitrates—Detection of. A drop of a solution of benzidine in dilute hydrochloric acid is held over the solution, suspected to contain nitrite, contained in a test-tube and acidified with 2*N* sulfuric acid, for some minutes. The drop is then transferred to a filter paper and a drop of an aqueous sodium hydroxide solution of β-naphthol is superposed. An intense red coloration indicates nitrite. To test for nitrate, nitrite is first removed, if present, by means of urea, the nitrate is reduced to nitrite by means of copper in presence of acid, and the nitrite detected as above.—A. C. BITTENCOURT and A. BARRETO. *Bol. Min. Agric., Rio de Janeiro*, 23 (1935), 7; through *J. Soc. Chem. Ind.*, 54 (1935), B., 225. (E. G. V.)

Nitrogen in Organic Compounds—Addition of Strong Hydrogen Peroxide in the Determination of. Report is made of an investigation undertaken to determine the amount of time saved and the accuracy obtainable when 30 per cent hydrogen peroxide is used. It has been found to be a valuable oxidizing agent because it hastens digestion and cuts down foaming. The method used was the Gunning modification of the original Kjeldahl, the official A. O. A. C. method. Results of the analysis of about twenty organic amino compounds are tabulated. The nitrogen was rapidly and accurately determined. A series containing nitrogen in the nitro form was studied and results are tabulated but quantitative recovery of nitrogen was not obtainable and results did not check. Other investigators have reported that nitro compounds cannot be determined by the unmodified Gunning method.—CHARLES F. POE. *J. Am. Pharm. Assoc.*, 25 (1936), 419. (Z. M. C.)

Oilseeds—Manchurian. I–III. Analytical data are tabulated for the following seeds and their oils: perilla (white and black species), flax, hemp, sunflower, soya-bean, sesamé (black and white species), cotton (four origins), peanut (2 species), castor and China jute.—T. INABA and K. KITAGAWA. *J. Soc. Chem. Ind., Japan*, 38 (1935), 73B; through *J. Soc. Chem. Ind.*, 54 (1935), B., 559. (E. G. V.)

Phosphoric Acid—Sources of Error in Determining, by the Citrate Method. Old ammonium citrate solutions, unless kept in waxed bottles, may dissolve sufficient silicon dioxide to precipitate appreciable amounts of calcium fluosilicate from superphosphate extracts. By re-

moving any precipitate forming on mixing the solutions, correct values are obtained. The use of solutions more dilute than those usually specified enables the precipitates to be washed more readily.—P. LEDERLE. *Z. anal. Chem.*, 100 (1935), 81; through *J. Soc. Chem. Ind.*, 54 (1935), B., 304. (E. G. V.)

Potassium—A New Reagent for. I. Qualitative. To 10 cc. of the aqueous solution to be tested, containing only the soluble group, add 3 cc. of a 2% solution of naphthol yellow S and set aside at room temperature. The appearance of a precipitate in 65 minutes or less will indicate the presence of 0.79 mg. of potassium or more per cc. of reaction mixture. As an alternative procedure, 3 cc. of a 5% solution of the reagent may be used, with a blank test run under the same conditions. The appearance of a precipitate in 20 minutes or less at room temperature will indicate the presence of 0.39 mg. or more of potassium per cc. of reaction mixture.—A. W. CLARK and C. O. WILLITS. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 209. (E. G. V.)

Primary and Secondary Rapid Determination of Alcohols—in Fats and Oils. Ten grams of fat are treated with 5 cc. of a saturated solution of potassium iodide in propyl alcohol, 2 drops of acetic acid are added and the mixture is heated at 50–60° for 10 minutes. The excess potassium iodide is titrated. The deterioration value is defined as the mg. of potassium iodide decomposed by 10 Gm. of fat.—J. GANGL and W. RUMPEL. *Z. Unters. Lebensm.*, 68 (1934), 533; through *J. Soc. Chem. Ind.*, 54 (1935), B., 364. (E. G. V.)

Quinic Acid—Quantitative Determination of. Quinic acid may easily be determined quantitatively in pure solution or in urine by a measurement of the optical rotation. This method must be modified for application to drugs since the sugars present lead to erroneous results. Several methods used for removing sugars either affected the quinic acid or carried it along in the precipitate. The method used for cinchona bark is as follows: 50 to 60 Gm. of powdered cinchona bark are treated in the cold with about one liter of water for 8 hours with occasional shaking. After filtration the extract is made up to one liter and treated with 100 cc. of a 25% suspension of calcium hydroxide in water (an excess); the filtrate evaporated to a syrupy consisteney and the calcium salt of quinic acid precipitated by the copious addition of alcohol. After 24 hours' standing the precipitate is filtered off and dissolved in acetic acid. The dark brown solution is treated with solid lead acetate, the precipitate filtered off with suction, the excess lead removed with hydrogen sulfide and the yellow liquid polarized. The authors find 7 to 7.5% quinic acid in cinchona bark, and by a similar method, 7.3 to 7.5% quinic acid in whortleberry leaves, 1 to 2% in coffee beans and 6 to 7% in green tea.—L. MESSINER-KLEBERMASS, R. KRETSCHMAYER and S. MOLNAR. *Scientia Pharm.*, 7 (1936), 58. (M. F. W. D.)

Salol—Determination of, in Oils. A refractometric method is described.—M. B. SCHVARTZMAN and L. M. SOLTZ. *Farm. Zhur.* (1934), 180; through *J. Soc. Chem. Ind.*, 54 (1935), B., 829. (E. G. V.)

Santonin—Determination of, in Santonica. In 1932 P. S. Massagetow published (*Arch. Pharm.*) a method for the determination of santonin in santonica. The German and Swiss Pharmacopœias use the method of Eder and Schneiter. Professor Stamm made a comparative study of these two methods in the Pharmacognostical Institute of the University of Dorpat. He finds that the former runs about 0.2% higher than the method of the Swiss Pharmacopœia. He, however, prefers the method of Massagetow, stating that it is simpler and gives more accurate results than the Swiss method.—*Pharmacia*, 16 (1936), 65; through *Pharm. Weekblad*, 73 (1936), 648. (E. H. W.)

Santonin—Determination of, in Santonica. In a later communication O. Hieronimus (*Pharm. Ztg.*, 81 (1936), 514) publishes results agreeing with those of Prof. Stamm, mentioned above.—*Pharm. Weekblad*, 73 (1936), 738. (E. H. W.)

Silver—Titration of, with Potassium Iodide. Ten or 20 cubic centimeters of a 0.1*N* silver nitrate solution were transferred to a 200-cc. beaker. To this were added water and a sufficient amount of sulfuric acid to give a volume of approximately 110 cc. (concentration of acid may vary from 0.2*N* to 3*N*), and then 3 cc. of 0.5% starch solution and 0.1 cc. of an approximately 0.1*N* ceric ammonium sulfate solution. It is important to add the sulfuric acid before the ceric ammonium sulfate. The silver was titrated with 0.1*N* potassium iodide solution. The end-point was sharp and easily detected when the last drop of potassium iodide gave a permanent blue-green color to the solution. Blank titrations were made under the same conditions omitting the silver

nitrate. The blank consumed 0.1 cc. of the potassium iodide solution before a permanent color was obtained.—A. BLOOM and W. M. MCNABB. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936) 167. (E. G. V.)

Soap—Determination of, in Pharmaceutical Preparations. The preparation containing soap is acidified with sulfuric or hydrochloric acids, when the fatty acids separate as a solid or semiliquid on the surface; to this is then added a small weighed amount of oleic acid (whose specific gravity is known) or a similar liquid (for example, liquid petrolatum) and the fatty acids dissolved to produce a homogeneous liquid layer. The mixture is warmed on a water-bath and sodium chloride dissolved in it to produce a saturated solution. The oily layer is then brought up into the graduated neck of a glass-stoppered cassia flask by the addition of warm saturated salt solution. The flask is allowed to come to 20° C. and the volume of the combined fatty acid-oleic acid layer read off. Since the volume of the oleic acid added can be calculated from the specific gravity, the weight of the fatty acids can be calculated using the weighted average specific gravities of the combined fatty acids found in the soap. Obviously, the acids present in the fats used to make the soap must be known. The following average specific gravities are used to calculate the weights of fatty acids liberated: from linseed oil—0.916, from olive oil—0.891, from lard—0.900, from tallow—0.903, from soaps made from 1 part olive oil and 1 part lard—0.895. The determinations of fatty acids in the following preparations official in the German pharmacopœia are carried out and reported: potassium soap, liquid glycerin soap, spirit of potassium soap, cresol soap solution (determinations for cresol, and for cresol and fatty acid), spirit of soap, liquid opodeldoc, medicinal soap, jalap soap, opodeldoc, liquid soap liniment and formaldehyde soap solution.—W. STÜWE. *Deutsch. Apoth.-Ztg.*, 50 (1935), 1545; through *Scientia Pharm.*, 7 (1936), 60. (M. F. W. D.)

Spirit of Sinapis—Simple Volumetric Determination of Allyl Mustard Oil in. The cheap apparatus (Fig. 2) illustrated on page 378 under Liquor Ammoniæ Anisatus was used. (B) is a pear-shaped vessel provided with an upright tube (R) divided into 0.02 cc. and a side tube (T). (K) is a spherical burette of 150 cc. capacity. Pour through (T) 150 cc. of saturated ammonium sulfate solution into (B) which is provided from below with a small rubber tube (G) and closed by a pinch-cock (Q). Introduce a weighed sample (about 10 Gm., of the spirit and close (T) with a rubber stopper. Mix carefully whereby the oil is salted out. Attach (B) by means of a rubber tube (S) which is provided at one end by a glass-cock (H), with (K). Open (H), then carefully (Q) and allow the ammonium sulfate solution from (K) to flow into (B) until the liquid runs into (R) to (N). By a rotating motion the oil drops rise to the surface. The ascent of the oil may be hastened by placing (B) in hot water. By adding more liquid from (K) and cooling, the volume of the oil is read. After each determination it is advisable to wash the apparatus with sulfuric acid-potassium dichromate solution to remove drops of the oil. Per cent oil equals $\frac{v.\ d.\ 100}{a}$ where v = oil volume, d = average specific gravity of the oil, and a = weight of the spirit taken. Results agree well with titration methods.—H. FAISER and E. FÜRST. *Apoth. Ztg.*, 50 (1935), 1734. (H. M. B.)

Sulfates—Direct Titration of. The internal indicator is composed of disodium tetrahydroxyquinone ground with dried potassium chloride in a 1 to 300 ratio. Carefully neutralize a 25-cc. sample containing up to approximately 2000 p. p. m. of sulfate with approximately 0.02*N* hydrochloric acid until just acid to phenolphthalein. The temperature of the sample should be below 35° C. and it is advisable to work between 20° and 25° C. Add either 25 cc. of ethyl alcohol or isopropyl alcohol. Introduce from 0.1 to 0.8 Gm. of indicator and swirl the flask to dissolve it; the solution will be colored a deep yellow. Titrate with standard barium chloride solution, the strength varying from 1 cc. = 1 mg. to 50 mg. of sulfate. Add the standard barium chloride at a steady dropping rate with a constant swirling of the flask until the yellow color changes to a rose. The rose color should appear throughout the body of the solution and not as spots of color. This point is taken as the end-point.—R. T. SHEEN and H. L. KAHLER. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 127. (E. G. V.)

Tertiary Alcohols—Determination of, by Cold Formylation. Contrary to Glichitch (*Bull. Soc. Chim.* [4], 33 (1923), 1284), the author finds that a number of terpenes (terpenes of bergamot, of lemon, of spirit of turpentine) are esterified to a considerable extent by cold formylation.—SÉBASTIEN SABETAY. *Ann. Fals.*, 29 (1936), 225-227. (A. P.-C.)

Thalleioquin and Erythroquin Reaction—Execution of. The thalleioquin reaction is not always reliable. The dependability of the reaction can be considerably increased if the excess of bromine is removed before the addition of the ammonia water. The procedure suggested is as follows: to the solution to be tested is added an excess of bromine water, and immediately dropwise $N/10$ ammonium thiocyanate till the bromine color disappears. Ammonia water is then added and, after one minute, one drop of chloroform which takes up the color. The procedure for the erythroquin reaction follows. To the solution to be tested is added potassium ferricyanide solution in excess (appearance of pale yellow color), an excess of bromine water, and then ammonium thiocyanate to remove the excess bromine. One drop of chloroform is added and ammonia water dropwise with shaking, the red color being taken up in the chloroform. Both tests are reliable with 1 cc. of solutions in dilution as high as 1 to 100,000.—L. ROSENTHALER. *Scientia Pharm.*, 7 (1936), 39. (M. F. W. D.)

Triethanolamine—Detection and Determination of. The properties of triethanolamine are briefly discussed. It can best be identified by microscopical examination of its chloroaurate, chloroplatinate and especially silicotungstate $SiO_2.12WO_24[N(CH_2CH_2OH)_3]$, the microscopical characteristics of which are described. The first two compounds are very soluble in water and must be crystallized from alcohol. The silicotungstate gives a precipitate that is soluble in excess of the precipitating reagent. In the absence of other nitrogeneous compounds, triethanolamine can be determined by the Kjeldahl method. It can also be determined by oxidizing with sodium hypobromite and measuring the liberated nitrogen, *e. g.*, in a suitably connected nitrometer tube. In the case of chocolate, the only likely interference would be from the theobromine, which is readily separated from triethanolamine. In chocolate mixtures triethanolamine can be readily separated and purified in the following manner so as to permit of its determination and identification: extract with chloroform which dissolves triethanolamine, fat and small quantities of sugar and albuminoids; evaporate the chloroform, take up the residue with hot water slightly acidified with hydrochloric acid and shake with benzene which removes the fat; to the aqueous solution add a little sodium carbonate, evaporate to dryness, take up in chloroform, re-evaporate, redissolve in cold water, filter and evaporate again; take up in water containing a few drops of $0.1N$ hydrochloric acid, filter and evaporate to dryness. The resulting triethanolamine hydrochloride is sufficiently pure for identification as chloroaurate or as silicotungstate, but formation of the chloroplatinate would require still further purification.—D. FLORENTIN and MME. I. RUIZ. *Ann. Fals.*, 29 (1936), 197–204. (A. P.-C.)

Tung Oil—Composition of American. Hanus iodine values were corrected for substitution by a separate determination of hydrogen bromide formed (as silver bromide). From these, with thiocyanate values and the saturated acids as determined by Bertram's method, tung oil fatty acids are shown to contain 0.8% of oleic acid. This is confirmed by the amount of dihydroxystearic acid recovered from the oxidation products.—R. S. MCKINNEY and G. S. JAMIESON. *Oil and Soap*, 12 (1935), 92; through *J. Soc. Chem. Ind.*, 54 (1935), B., 639. (E. G. V.)

Veronal, Luminal and Medicinal—Quantitative Determination of. The following procedure is proposed: "Dissolve 0.1–0.2 Gm. of veronal or luminal in 20 cc. of alcohol, add 2–3 drops of 0.1% alcoholic solution of thymolphthalein and titrate with $0.1N$ NaOH to a blue color." One cc. $0.1N$ sodium hydroxide = 0.018419 Gm. veronal or 0.0232 Gm. luminal. It is concluded that these substances may be determined with sufficient accuracy as quickly argentimetrically or acidimetrically. To determine these substances in medicinals containing chlorine, bromine and iodine compounds and in soap mixtures the method of Budde cannot be employed but the acidimetric method is applicable.—S. BABITSCH. *Pharm. Monasth.*, 17 (1936), 87. (H. M. B.)

Viscous Liquids—Surface-Tension Measurements of. By allowing a small air jet to impinge on the surface of a liquid, there is produced a small depression whose depth is an inverse function of the surface tension of the liquid. This procedure is particularly suited to viscous liquids.—A. H. PFUND and H. GREENFIELD. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 81. (E. G. V.)

Volatile Oils—Quantitative Determination of, in Alcoholic Solutions. The author criticizes the method of Brodsky and Barsukowa (*Pharm. Zentralh.*, 76 (1935), 371) in that the specific gravity used in the calculation is an average one and is therefore not correct for the individual sample and because the ammonium sulfate solution used in salting out the oil still retains some oil in solution. Their method consists of salting out the volatile oil with ammonium sulfate solution,

determining the volume of the separated oil and calculating the percentage by means of the average specific gravity. Another error in this method lies in the fact that very often droplets of oil will adhere to the apparatus. The author suggests a gravimetric method which is carried out as follows: A quantity of the alcoholic solution equivalent to about 200 mg. of volatile oil is used. This is poured from a tared 25-cc. Erlenmeyer flask, thus giving an accurate weight of the amount used. The alcoholic solution is poured into a 100-cc. separatory funnel, 80 cc. of a 30% solution of ammonium sulfate added and the whole vigorously shaken. When the oil has separated the aqueous solution is filtered through a filter containing about 1 Gm. of medicinal norit (a high-grade absorbent carbon) along the walls. The separatory funnel and filter are washed twice with 5 cc. of ammonium sulfate solution. The filtrate may be used (after treatment with sulfuric acid) for the determination of alcohol. The filter with the norit is transferred to the separatory funnel, 15 cc. of ether added as well as enough desiccated sodium sulfate to absorb the moisture. After vigorous shaking the ether solution is filtered through a small filter in which the upper edge of the paper lies about 1 cm. below the rim of the funnel. The filtrate is caught in a dried and weighed flask of about 150 cc. capacity, which contains a carefully weighed quantity (about 0.5 Gm.) of liquid paraffin. Separatory funnel and filter are washed five times with 5 cc. of ether. The combined ether solutions are then evaporated on the water-bath at a temperature not higher than 40° and dried in a calcium oxide desiccator to constant weight. The author gives comparative results of both the volumetric and gravimetric methods with Solut. Ammoniæ, Spt. Anisata, Spt. Menthæ Piperitæ, Spt. Sinapis, Spt. Lavandulæ, Spt. Rosmarini and Spt. Juniperi, all of known composition. The results show that the volumetric method runs much too low but that the gravimetric method is fairly accurate.—H. J. VAN GIFFEN. *Pharm. Weekblad*, 73 (1936), 641. (E. H. W.)

Water—Determination of, in Mixtures of Solvents with. A stream of air is passed over 0.1–1.0 Gm. of the solvent at 30–40°, and the vapors are passed through a weighed U-tube containing calcium carbide, which is again weighed 15 minutes after the last trace of solvent has evaporated; then % of water equals $359.74\ b/a$, where b is the increment in weight and a the weight of solvent taken. The method gives trustworthy results for alcohol-water and alcohol-water-ethyl acetate mixtures containing 0.5–83% of water.—A. N. JUZICHIN. *Zavod. Lab.*, 3 (1934), 1129; through *J. Soc. Chem. Ind.*, 54 (1935), B., 395. (E. G. V.)

PHARMACOGNOSY

VEGETABLE DRUGS

"Artemisias" from Persia—Santonin Content of. A study of *Artemisia absinthium*, *A. pontica*, *A. camphorata*, *A. maritima* and *A. cina* (Berg) Willkomm. *A. absinthium* and *A. pontica* contained no santonin. The unopened flower heads of *A. camphorata* growing at high altitudes contain 0.2% santonin; *A. maritima* also contains 0.2%, and *A. cina* contains 1.10% according to the origin and condition of the flower heads.—M. M. JANOT and J. GAUTHIER. *Bull. sci. pharmacol.*, 42 (1935), 404–408; through *Chimie & Industrie*, 35 (1936), 886. (A. P.-C.)

Austrian Drug Plants—Standardization of. The following drugs were examined: fennel fruit, absinthium herb and leaves, *Malva silvestris* leaves and flowers, and leaves and flowers of farfara. Certain physical properties and chemical constants are reported.—WALTER HECHT. *Pharm. Monatsh.*, 17 (1936), 106–111. (H. M. B.)

Cracca Virginiana L. Root—Histology of. The root has come into prominence following the discovery of its insecticidal properties and the isolation of rotenone and tephrosin. Since commercial rotenone is limited to foreign sources, it is desirable to develop a native source. The United States Department of Agriculture is making an extended study. If this confirms the hope that this root will prove an American source, it will be desirable to know histological characteristics of related species in order to differentiate. The present report covers histological and morphological characteristics.—B. V. CHRISTENSEN and ELBERT VOSS. *J. Am. Pharm. Assoc.*, 25 (1936), 519. (Z. M. C.)

Derris Root—Localization of Rotenone in. Many of the derris roots are employed as fish poisons or as insecticides. The authors examined the roots of *Derris elliptica* Benth. and *Derris malaccensis* Prain, microscopically employing the method of Jones and Smith in which sections are treated with a drop of 50% nitric acid on a slide. This is followed by a drop of water, then by several drops of 10% ammonia, after which the coverglass is replaced. A

green color develops in the cells containing rotenone or related compounds. Rotenone was found in the parenchyma and in the medullary ray cells of both the wood and bark. None was found in the tracheæ or in the bast or wood fibres. The Smith and Jones reaction also offers a rapid method for the determination of the presence or absence of rotenone in powdered derris root. The article includes a drawing of a transverse section of derris root.—P. A. VAN DER LAAN. *Pharm. Weekblad*, 73 (1936), 313. (E. H. W.)

Drugs—Chemical Identity Reactions in. For the identification and determination of purity of drugs, the author lists a definite chemical or physical test for numerous drugs such as: anthraquinone derivatives in alœ, frangula, senna or rhubarb; arbutin in uva ursi; berberine in hydrastis; emetine in ipecac; specific coloring principles in crocus, capsicum or curcuma; tannins in catechu, pomegranate, white oak, nutgall, rhatany or tomentilla; saponins in soap-bark, guaiac wood, saponaria, senega, or general saponin-containing drugs; mucilages in marshmallow, linseed, tragacanth or salep; starch in triticum, ipecac or glycyrrhiza; strychnine in nux vomica; cellulose in cotton or gentian.—ALFRED MOSIG. *Pharm. Zentralh.*, 77 (1936), 345. (E. V. S.)

Ginger. Its Cultivation, Presentation and Preparation. An abstract from the carefully prepared brochure of Stafford Allen and Sons, Ltd. is given.—ANON. *Perfumery Essent. Oil Record*, 27 (1936), 258. (A. C. DeD.)

Indian Hemp from Lebanon. Indian hemp is easily acclimatized in Lebanon, but when cultivated in the lowlands it gradually loses the property of yielding an active resin (hachich) and at the same time its morphology changes. Generally speaking, high altitudes are suitable for the production of hachich. The two principal processes of production of hachich are described; it is a greenish brown pulverulent resin which rapidly loses its activity by oxidation, but which can be kept for 5 yrs. in sealed boxes. Tests for alkaloids were negative. The reactions of cannabinol are briefly outlined.—E. SAFI. *Ann. Fac. Française Méd. Pharm. Beyrouth*, 4 (1935), 204–247; through *Chimie & Industrie*, 35 (1936), 886. (A. P.-C.)

P'an-Shia—Composition of. I. The drug (*Pinella tuberifera* Ten. or *P. ternata* Breit) has an anæsthetic action and contains an ether-soluble alkaloid.—T. H. TANG and T. Y. TSENG. *Nat. Shantung Univ. Chem. Lab. Repts.*, Nos. 3–4 (1934), 63; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1164. (E. G. V.)

Senega—Morphological Studies on. Report is made of a study of *Polygala Senega* L. Subdivisions will indicate the scope: description of the fresh root, macroscopical description of drug, histological studies and discussion of some abnormal developments exhibited by senega root. The article is illustrated.—PAUL D. CARPENTER. *J. Am. Pharm. Assoc.*, 25 (1936), 507. (Z. M. C.)

Sumatra Benzoin. This article is a review of the author's dissertation at Amsterdam. Following an historical introduction, the botany, physiology, culture, collection and commerce of Sumatra benzoin is exhaustively discussed. Complete descriptions are given for the various kinds of Sumatra benzoin. A study of the benzaldehyde reaction for cinnamic acid showed that methyl cinnamate, ethyl cinnamate, isobutyl cinnamate, amyl cinnamate, benzyl cinnamate, and phenyl cinnamate react positive while cinnamyl cinnamate, terpinyl cinnamate, linalyl cinnamate, citronellyl cinnamate and geranylic cinnamate give negative reactions. Methods are discussed for the determination of insoluble matter, ash, moisture, acid number, saponification number, ester number, cinnamic acid and benzoic acid. The following table of analytical results covering 19 samples of Sumatra benzoin and one of Palembang benzoin is given:

No.	Sample	Bot. Source	Insol. Residue	Ash	Moisture	Cinnamic Acid	Benzoic Acid
	Sumatra Benzoin						
1	First exudation	*S. Benzoin*	7.23	0.29	1.42	...	39.16
2	" "	" "	7.89	2.0	1.58	...	35.03
3	Large almond, Mata kasar	*S. parall.*	3.05	0.31	1.28	30.32	10.62
4	Large almond, Mata bezar	" "	7.36	0.36	1.55	28.50	12.36
5	Small almond, Mata haloes	" "	11.17	1.36	2.67	27.30	7.86
6	Small almond, Mata haloes	" "	7.80	0.57	1.75	26.85	10.04
7	Djarir	" "	24.10	0.74	3.58	18.63	6.24
8	Mixture	" "	5.45	0.50	1.84	24.55	7.50
9	Almond	*S. Benzoin*	3.40	0.24	1.78	...	33.90

No.	Sample	Bot. Source	Insol. Residue	Ash	Moisture	Cinnamic Acid	Benzoic Acid
10	Soft quality	*S. Benzoin*	2.40	0.22	1.82	...	33.27
11	Brown resin	" "	11.26	0.70	2.70	...	26.99
12	Brown shell	" "	42.85	1.40	3.55	...	17.89
13	Basic mass of Singkal, 1st quality	" " (?)	26.60	1.0	4.30	...	22.48
14	Basic mass of Baros, 1st quality	" " (?)	58.80	2.53	8.42	...	5.73
15	Basic mass of Baros, 2nd quality	" " (?)	100.0	2.90	14.22	...	...
16	Comm. sample, 1st quality	.....	24.75	2.60	3.72	11.04	11.06
17	Comm. sample, 1st quality	.....	26.51	2.30	4.08	12.65	9.32
18	Comm. sample, good quality	.....	34.95	1.80	5.50	9.60	11.50
19	Comm. sample, good quality *Palembang Benzoin*	.....	33.08	1.56	4.24	9.35	8.23
20	Comm. sample, good quality	*S. Benzoin*	15.86	4.10	3.88	...	24.55

Calculations for cinnamic and benzoic acids on the soluble portion without moisture are also given. —P. H. BRANS. *Pharm. Weekblad*, 73 (1936), 374. (E. H. W.)

Wei-Ling-Sien. I. The drug is identified as *Clematis augustifolia* Jacq., acts as an anæsthetic and contains an unidentified alkaloid.—T. H. TANG and E. H. CHAO. *Nat. Shantung Univ. Chem. Lab. Repts.*, Nos. 3-4 (1934), 19; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1164. (E. G. V.)

ANIMAL DRUGS

Honey—Origin of, Determination of. The technic of microscopical examination is given. E. ZANDER. *Angew. Chem.*, 48 (1935), 147; through *J. Soc. Chem. Ind.*, 54 (1935), B., 378. (E. G. V.)

PHARMACY

GALENICAL

Adonis and Convallaria Infusions—Stability and Pharmacological Action of. Tested by the long-period frog method, 1 to 5% infusions of *Adonis vernalis* were found to contain the whole of the activity of the drug; a 10% infusion about 82%. Similarly, with *C. majalis*, the 1 to 5% infusions contained all of the activity, and the 10% infusion 75% of the activity. On keeping for two to three weeks, infusions of both drugs showed turbidity and change of color, but there was no loss of strength. After this time the strength fell gradually to from 68 to 92% of the original activity after three to four months. The more concentrated infusions appeared to lose strength more slowly than the weaker ones.—Y. AHONEN. *Farm. Notisbl.*, 44 (1935), 194; through *Quart. J. Pharm. Pharmacol.*, 9 (1936), 148. (S. W. G.)

Adonis Vernalis—Stable Concentrated Preparations of. The 25% alcohol percolate is evaporated to dryness and the residue mixed either with dextrin or with sugar solution and alcohol. —A. G. BOSIN. *Khim. Farm. Prom.*, No. 3 (1934), 35; through *J. Soc. Chem. Ind.*, 54 (1935), B., 828. (E. G. V.)

Bitter Almond Water. In the method of Swed. Phar. X for the preparation of bitter almond water much active material is lost in the second and third distillates. To save all the benzaldehyde cyanhydrin in the almond mash first distil with low pressure steam until the distillate gives no precipitate with ammonia-silver nitrate-nitric acid reagent, then add the calculated amount of spirit. This dilute almond water is now redistilled, this time with high pressure steam as there is now no risk of overheating. The distillate need only be titrated and adjusted to strength with aqueous alcohol (1 + 3). The yield is thus bettered and the dilution requires only two titrations. The keeping qualities are excellent. A preparation of content 0.105% HCN in December 1934, reassayed March 15, 1936, was 0.101%.—G. OLIN. *Farm. Revy*, 35 (1936), 351. (C. S. L.)

Casein for Pharmaceutical Use. Although casein is used in a variety of pharmaceutical preparations only the Belgian Pharmacopœia mentions it among its list of reagents. The author discusses the various methods of manufacture of casein and the variation in the final product as

prepared by these methods; the methods for the analysis of casein and the variety of pharmaceutical forms and their employment. A table is included giving the moisture, ash, solubility, alkalinity both of the filtered and unfiltered solutions, and the behavior toward sodium phosphate solution, water and ammonia, of 7 samples of Dutch manufacture, one of French, one of English, 4 of German and 4 of Danish manufacture.—J. J. HOFMAN. *Pharm. Weekblad*, 73 (1936), 420. (E. H. W.)

Cinchona Bark—Preparations of, Preparation and Assay of. Descriptive.—K. MATOLCSY. *Magyar Gyóg. Társaság Értes.*, 10 (1934), 488; through *J. Soc. Chem. Ind.*, 54 (1935), B., 700. (E. G. V.)

Copper Tetraminosulfate—II. Pharmaceutical Data. Solutions of $Cu(NH_3)_4SO_4.H_2O$ (I) used for therapeutic purposes usually also contain caffeine and sodium benzoate. Such solutions are unstable. By substituting ammonium for sodium benzoate stable solutions are obtained. Such solutions may be heated at 70° for 20 minutes. Sucrose with glycerin or with sodium potassium tartrate also has a stabilizing action. Methods of preparing stable sterile solutions of (I) are given.—E. DEL CARLO and P. G. PATERNOSTO. *Rev. fac. cienc. quím., La Plata*, 9 (1934), 41; through *J. Soc. Chem. Ind.*, 54 (1935), B., 923. (E. G. V.)

Cornstarch—Granule Disintegration of. In making soluble starch, certain changes take place that can be followed by determination of the alkali-labile value. Dry-grinding cornstarch produces changes similar to those produced by the Lintner acid treatment when alkali-labile value is taken as a criterion. Corn α-amylose loses combined fatty acids and amyloid material becomes soluble, but the insoluble residue has a higher fatty acid content than the material from which it came.—T. C. TAYLOR and J. C. KERESZTESY. *Ind. Eng. Chem.*, 28 (1936), 502. (E. G. V.)

Digitalis—Deterioration of. Assay of Digitalis. Rates of deterioration of 10% digitalis infusion, 0.1% aqueous ouabain solution, and of digitamin are compared at 30° and at refrigerator temperatures. Comparison is made of various biological methods of assay.—B. NUKI, M. TAMAKI, T. MATSUO. *Japan. J. Med. Sci.*, IV, 8 (1934), 145, 146; through *J. Soc. Chem. Ind.*, 54 (1935), B., 877. (E. G. V.)

Drug Extraction. IX. Efficiency of Repercolation for Belladonna Root and Nux Vomica. Reference is made to the pioneer work of Squibb and Diehl and later studies by Arny and Oxley and Scoville. Experimental work is reported in detail. Repercolation proved successful for fluidextract of belladonna root and fairly successful for fluidextract of nux vomica.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 25 (1936), 391. (Z. M. C.)

Drugs and Their Control—Some New Types of. An account of a study tour in the U. S. A. for the purpose of considering the control methods employed in the evaluation of such modern drug agents as vitamin concentrates, liver extract and hormones. In particular the vitamin assay laboratory of the Drug Control Division, U. S. Dept. of Agriculture, Washington, D. C., the Harvard Medical School clinic for pernicious anemia therapy, Dr. Swingle's cortin work at Princeton and Dr. Evan's vitamin E research at the University of California are described.—B. RÖNNMARK. *Farm. Revy*, 35 (1936), 357. (C. S. L.)

Epinephrine Solutions—Stabilization of. It should be possible to stabilize epinephrine solutions with three classes of compounds, namely, negative catalysts, or catalysis poisons, such as cyan compounds or butyl alcohol, compounds which spare the epinephrine by themselves taking up oxygen first, such as glycocol or tyrosine or, third, reducing agents which have a reduction potential with respect to epinephrine, such including ascorbic acid, glutathione, hydrazine, sulfite, metabisulfite, etc. Colorimetric determinations on solutions aged for eight months show that the reducing agents are the best preservatives in this regard, and best of all is sodium metabisulfite. The solution becomes practically entirely stable, and the stabilizer is of low toxicity and without chemical action on the epinephrine, either *per se*, or from oxidation products of the metabisulfite. Experiments demonstrate that there is no pharmacological effect, nor does the preservative affect the action of substances often dispensed in mixtures with epinephrine, such as ephedrine, insulin or novocaine. In the case of vasopressin this hormone is not inactivated by metabisulfite or by chloretone individually, but is completely inactivated by them in combination.—B. SJÖGREN and H. LARSSON. *Farm. Revy*, 35 (1936), 309, 325. (C. S. L.)

Extracts—Considerations on the Preparation of. A general study and discussion of the preparation of dry extracts of plants with a view to simplifying pharmacopœial operations and assays, and which as "Standard extracts" would facilitate control and be easier to handle.—A.

GORIS and M. JANOT. *Congrès de Pharmacie (Liège 1934)*, (1935), 216–224; through *Chimie & Industrie*, 35 (1936), 892. (A. P.-C.)

Galenical Preparations—Researches on. IV. Orange Flower Water. This preparation, official in many pharmacopœias, was often found adulterated. As indications of the quality of the preparation were chosen the simple titration with *N*/10 KOH, an ester determination and then a bromacidimetric titration (titration of the brom-acids formed on treatment with bromine water) with *N*/10 KOH. The results of these determinations on 50-cc. samples of orange flower water obtained from various sources were compiled in a table. In that they were colored, most of the samples did not meet the pharmacopœial requirements. It is possible to detect some facts about the sample as, for example, the use of calcined magnesia as a distributing agent and the use of methyl anthranilate in the preparation of the orange flower water.—L. ROSENTHALER. *Pharm. Acta. Helv.*, 11 (1936), 111. (M. F. W. D.)

Heroin Solutions. The author finds that under the influence of light a 1% solution of heroin decomposes. In three months 30% had decomposed into α-monoacetylmorphine and after 8 months 70% had decomposed into α-monoacetylmorphine. After $1^1/_2$ years 90% was decomposed into the monoacetyl product and 10% into morphine.—RIZOTTI. *Arch. Intern. Pharmacodynam.*, 52 (1935), 87; through *Pharm. Weekblad*, 73 (1936), 647. (E. H. W.)

Indian Indigenous Medicine—Some Inorganic Preparations of. (I). Abhra Bhasma. Values are given for the analyses of the total, water-soluble and hydrochloric acid-soluble fractions of mica ash.—R. N. CHOPRA, S. GOSH and A. DUTT. *Indian J. Med. Res.*, 22 (1934), 285; through *J. Soc. Chem. Ind.*, 53 (1935), B., 828. (E. G. V.)

Liquid Petrolatum, White and Yellow Petrolatum for Medicinal Use—Testing of. While Hungarian Pharmacopœia IV designates a limit for the specific gravity and density of white and yellow petrolatum as well as a procedure for the determination of the same K. finds that the determination of these values is of no importance in evaluating these substances. Melting and congealing points are determined in a test-tube of 3–4 cm. in diameter with a flat bottom and provided with a stirrer and thermometer. Congealing point values should be between 42–52° C.; melting point values 45–55° C. Viscosity determinations are of utmost importance and K. believes that white and yellow petrolatum at 100° C. should have a viscosity of 1.6 Engler degrees; at 70° C., 2.5 Engler degrees. Other tests necessary to detect impurities are the iodo-brom number, reaction to sulfuric acid, sodium hydroxide and determination of inorganic impurities. The sulfuric acid reaction is carried out as follows: Place 5 cc. of the melted petrolatum and 5 cc. of the acid in a glass-stoppered test-tube on a boiling water-bath and allow to react for 15 minutes and then shake for 125 seconds. The color produced should not be any greater than that of 5 cc. of a mixture of 10 drops of 0.5*N* I-KI solution in 110 cc. water. The test with sodium hydroxide detects such adulterants as saponifiable materials, fats, etc. The presence of appreciable amounts of inorganic salts (sodium sulfate, sodium chloride, etc.) is ascertained by the production of a turbidity when the petrolatum is dissolved in carbon tetrachloride. For the exclusion of paraffin the following method is proposed: In a test-tube graduated in centimeters and provided with a glass stopper, introduce 20 cc. of a mixture of equal parts of absolute alcohol and 10 cc. benzene, add 1 Gm. petrolatum, dissolve by gentle warming, allow to stand for 3 hours in an ice-bath. The residue should not exceed 10 cc. The density of liquid petrolatum was found to range from 0.875–0.885. When 5 cc. of liquid petrolatum is treated with 5 cc. sulfuric acid in a glass-stoppered test-tube, placed on a boiling water-bath for 10 minutes and then shaken for 125 seconds, the oil retains its original color and the acid at the most assumes only a shade of bright brown color; the iodo-brom number for 5 cc. of the liquid should not be more than 0.1; determination of the viscosity is incidental.—J. KENDERES. *Pharm. Monatsh.*, 17 (1936), 86–87. (H. M. B.)

Liver Extract. An extract of mammalian liver is prepared containing sufficient water to permit alcoholic fermentation; the extract is subjected to alcoholic fermentation to remove fermentable carbohydrates, and the fermented extract is concentrated to the desired extent.—FREDERIC FENGER, assignor to ARMOUR AND CO. U. S. pat. 2,045,266 June 23, 1936. (A. P.-C.)

Medicines—Studies of, for Injection. VII. The Stability of Scopolamine Solutions on Heat Sterilization. The method of Schou and Bjerregaard for the determination of atropine is adapted for the determination of scopolamine. The degree of hydrolysis of scopolamine may be determined by shaking out the basic components (scopolamine, scopine and scopoline) and determining the content of tropic acid in the residue. Using these methods, the sterilization of am-

puls of pure water solutions of scopolamine hydrobromide is studied. The solution is sufficiently stable so that 20 minutes at 120° C. produces no detectable hydrolysis. If a buffer is added to hold the reaction at p_H 6 or higher, the solution becomes very unstable. Adding polyvalent alcohols, such as mannite or sorbite, as Straub has proposed, is without effect on the hydrolysis. The hydrolysis of scopolamine in buffered solutions is the same whether or not mannite or sorbite are added.—S. A. SCHOU. *Dansk Tids. Farm.*, 10 (1936), 145. (C. S. L.)

Milk of Magnesia—A Study of the Washing of, through a Permeable Membrane. The decantation method of washing milk of magnesia has important disadvantages. Rate of settling is slow even when temperature is raised for purpose of hastening it, so does not lend itself to economy of wash water by permitting use of wash water used for later stages of a previous batch. It appeared that these difficulties could be overcome if a permeable membrane were used. The effect of adsorption as well as simple diffusion was considered and an equation derived from Fick's Diffusion Law and Freundlich's adsorption isotherm. Experimental work is reported in detail and a practical evaluation as applied to milk of magnesia is shown.—E. MONESS, W. A. LOTT and W. G. CHRISTIANSEN. *J. Am. Pharm. Assoc.*, 25 (1936), 524. (Z. M. C.)

Ointment Bases—Vitamin D Content of, Containing Cholesterol. I. Absorption through the Intestinal Mucosa. II. Absorption through the Skin. Adeps Lanæ anhydrosus contains pro-vitamin-D, but in smaller amounts than vigantol. Leolan has no antirachitic activity. Ointments containing cholesterol after irradiation contain vitamin D which is absorbed through the skin and induces antirachitic activity. Relatively large administration of such ointments does not lead to symptoms of hyper-vitaminosis. More vigantol is absorbed through the intestinal mucosa than through the skin. Unirradiated ergosterol is also absorbed through the skin.—A. S. VON MALLINCKRODT-HAUPT. *Z. Vitaminforsch.*, 4 (1935), 1; through *J. Soc. Chem. Ind.*, 54 (1935), B., 429. (E. G. V.)

Phenacetin Granules—Water Content of, Importance in Compressing. The binding agents, powdered maranta starch and powdered agar markedly affect the water content of phenacetin granules. From moist air this may become 8–15% for granules made with the starch, or 10–18% with the agar. Since phenacetin does not tend to decompose water may be tolerated, but for convenient compressing the content should be controlled. After drying the granules may be exposed to moist air until the optimum moisture for convenient compressing conditions is attained. In the formula used this optimum lay between 2.23–2.54% of water.—V. WÜRTZEN. *Arch. Pharm. og Chemi*, 43 (1936), 217. (C. S. L.)

Sodium Hyposulfite—Preparation of. Pure sodium hyposulfite solution is best prepared by adding a weighed amount of sulfur dioxide from a cylinder of the liquid to a slight excess of zinc powder stirred in water. The aqueous zinc hyposulfite is then run into aqueous sodium carbonate and filtered. A less pure product can be obtained by using similarly the gases from burning sulfur.—C. SUNDER. *Bull. Soc. Ind. Mulhouse*, 101 (1935), 114; through *J. Soc. Chem. Ind.*, 54 (1935), B., 451. (E. G. V.)

Spirits of Nitrous Ether. The methods of the U. S. P. X, the Netherlands, the British 1932, and the Helv. V. Pharmacopœias for preparation of Spirits of Nitrous Ether are discussed and compared, also the assay methods both gravimetric and titrimetric. The keeping qualities of a preparation made by distillation are studied. In the icebox at 4° C., 30% depreciation is seen in 12 days; in a cool cellar (12–15° C.), 68% loss occurs in this time, while at room temperature there is 78% loss in six days and complete destruction at 12 days.—W. HÖK. *Farm. Revy*, 35 (1936), 273. (C. S. L.)

Tinctures—Preparation of, Containing Alkaloids. Comparison of maceration and lixiviation, carried out on belladonna, colchicum, nux vomica, opium and cinchona. Maceration was carried out with 70% alcohol for 3 to 10 days, and lixiviation with alcohol of the same strength. For colchicum, nux vomica and cinchona, lixiviation was better than maceration, best results being obtained with a period of 8 to 10 days' contact. Preparation of tinctures by digestion on the water-bath is suitable in the case of tinctures that must be obtained in a few hours. Determination of viscosity is an important criterion in the evaluation of tinctures.—A. JERMSTAD. *Congrès de Pharmacie (Liège 1934)*, (1935), 284–287; through *Chimie & Industrie*, 35 (1936), 892. (A. P.-C.)

Tinctures—Step Photometric Measurement of. The curves for many tinctures are so characteristic as to permit their identification. The changes produced in tinctures not exposed to

light are not great in view of the range of measurement and the breaks in the curves. The same criteria afford an insight into the aging of tinctures. This method of investigation is described in an earlier communication (*Arch. Pharm.*, 272 (1934), 716). A discussion is given for the results obtained with original tinctures and for tinctures one year old stored in the dark and exposed to light. Those investigated are: arnica, aurantii, belladonna, benzoin, capsicum, cinnamon, galla, myrrh, krameria and strophanthus.—P. W. DANCKWORTT. *Arch. Pharm.*, 273 (1935), 467. (L. L. M.)

Ultrafiltration—Application of, to the Extraction of Active Principles of Plants. A description of the preparation of ultrafilters. The active principles of belladonna, henbane and strophanthus pass through an acetate-collodion filter, of porosity calculated to let pass only crystalloids as Graham understood that term, and can thus be obtained in a very pure state.—L. I. BRACCIO. *Boll. chim. farm.*, 74 (1935), 185; through *Chem. Abst.*, 29 (1935), 4517.

White Mineral Oils—Stabilizing of. Oils are stabilized against deterioration due to oxidation by adding about 1 to 2% of an oil which has been subjected to the heavy fuming sulphuric acid treatment required to produce white oil of U. S. P. grade and neutralized with an alkali and containing components of the mineral oil which are removed during the filtration step in the manufacture of U. S. P. white mineral oils.—FRANCIS M. ARCHIBALD, assignor to STANDARD OIL DEVELOPMENT CO. U. S. pat. 2,035,418, March 24, 1936. (A. P.-C.)

PHARMACOPŒIAS AND FORMULARIES

Addendum Report—Comments on. The new substances recommended for inclusion in the British Pharmacopœia include three antitoxins; Antitoxinum Œdematiens and Antitoxinum Vibriosepticum, which may be looked upon as being companion antitoxins to Antitoxinum Welchicum in the treatment of infected wounds and in abdominal surgery, and Antitoxinum Staphylococcicum. Two new sera are proposed for inclusion: Serum Antipneumococcicum I and Serum Antipneumococcicum II. It is recommended that new monographs be substituted for the present ones on Aqua Sterilisata and Physiological Solution of Sodium Chloride. The proposed new monograph on the latter permits it to be sterilized by heating in an autoclave. Hydrated Calcium Chloride, the salt proposed for use when injections of calcium chloride are prescribed, may cause some inaccurate dispensing owing to the ease with which it acquires water. Recommendations of the General Chemistry Committee are in regards to the following: Phenol Liquefactum, Phenolphthaleinum, Plumbi Acetas, Potassi Hydroxidum, Quininæ et Æthylis Carbonas, Sapo Animalis, Sodii Hydroxidum, Sodii Phosphas, Sulpharsphenamina, Thyroideum, and Zinci Sulphas. The Vitamin Committee has submitted new monographs for the following: Ascorbic Acid, Calciferol, Liquor Calciferolis and Pulvis Vitamin B. Other recommendations by the Committee include a change in the description of cod liver oil.—ANON. *Pharm. J.*, 136 (1936), 471, 530. (W. B. B.)

NON-OFFICIAL FORMULÆ

Anti-Sunburn and Suntan Preparations. A product which has recently been introduced for the production of anti-sunburn preparations is menthyl salicylate. It is a colorless, oily liquid with a faint, barely perceptible odor. It is very easily soluble in mineral and vegetable oils, so that its incorporation in anti-sunburn oils presents no special problems. The following formula is suggested as yielding a presentable product: Liquid paraffin (low viscosity), 53.0 by vol.; beeswax, white, 15.0 by weight; borax in powder, 0.5 by weight; rose-water or distilled water, 21.5 by vol.; menthyl salicylate, 10.0 by weight; perfume, *q. s.* Much attention is being paid in France to the æsculin aglycone, æsculetine and related hydroxy derivatives of coumarin, as sunburn preventatives.—H. S. REDGROVE. *Pharm. J.*, 136 (1936), 567. (W. B. B.)

Bentonite—Compounds of, Suitable for Therapeutic Uses. Bentonite and an organic base (such as arecoline for combating intestinal parasites) are brought together in the presence of water and with the addition of acid in an amount sufficient to neutralize the base and the natural alkalinity of the bentonite, followed by washing with a salt of the organic base employed.—CLAUDE R. SMITH. U. S. pat. 2,033,856, March 10, 1936. (A. P.-C.)

Burn Ointments. Sunburn ointments should (1) contain an anæsthetic which will act quickly upon application, (2) contain a good antiseptic to prevent infection, (3) be easy to apply, (4) be cool and soothing, (5) prevent as much as possible vesication or blistering of the skin, (6)

have a good after effect and promote healing, (7) not be too odoriferous, (8) not stain clothing or discolor the skin, (9) not contain poisonous chemicals apt to be absorbed on extensive application. The following formulæ are offered: (1) *Burn Ointment.*—Linseed oil, refined 30, phenyl mercuric nitrate 0.05, cod liver oil concentrate (Vitamin D) 0.50, cholesterin 1, lecithin 0.50, amber petrolatum, soft 65.95, eucalyptus 2. Warm the linseed oil to 110° F., dissolve in it all the ingredients except the petrolatum. Heat the petrolatum until it liquefies, cool to 110° F. and add the oil mixture. The preparation can be converted into an oil by substituting cotton seed, peanut or castor oils for the petrolatum. (2) *Burn Ointment.*—Oxyquinoline benzoate 0.20, camphor-phenol 4, linseed oil 20, olive oil 20, cholesterin absorption base 55.80. Dissolve the benzoate and the camphor-phenol in the mixed oils, warm the base to 90° F. and pour the oils into it. (3) Glyceryl monostearate 12, cetyl alcohol 4, lanolin 2, lecithin 1, linseed oil 15, glycerin 10, water 55.95 and phenyl mercuric nitrate 0.05. Place all ingredients into a kettle, heat and mix. (4) *Calomel Cream.*—Prepared calamine 20, linseed oil 30, lanolin absorption base 50. Mix the calamine in the linseed oil and stir the mixture into the absorption base and mill.—ANON. *Drug and Cosmetic Ind.*, 38 (1936), 777–778. (H. M. B.)

Combined Fungicidal and Insecticidal Spray Materials. A composition of matter suitable for use as an insecticide and fungicide is composed of an emulsion of a stable oil, a penetrating and solvent agent, water, an emulsifying agent, and a mercury compound that has fungicidal properties and that is soluble in at least one of the constituents of the emulsion.—WENDELL H. TISDALE and LOUIS S. BAKE, assignors to E. I. DU PONT DE NEMOURS & CO. U. S. pat. 2,044,959, June 23, 1936. (A. P.-C.)

Dentifrice Polishing Base. A dentifrice polishing base is composed of a powder consisting of tricalcium phosphate and calcium and magnesium carbonate and a minor proportion of an alkali metal pyrophosphate, the amount of pyrophosphate being markedly less than sufficient to dissolve the calcium or magnesium present.—JOSEPH JANOTA, JR., assignor to VICTOR CHEMICAL WORKS. U. S. pat. 2,041,473, May 19, 1936. (A. P.-C.)

Fungicide and Insecticide. A fungicide or insecticide contains as the active ingredient a copper zeolite having copper present in the base exchangeable portion of the zeolite.—ALEXANDER A. NIKITIN, PHILIP B. MYERS and JAMES FOWLER ADAMS, assignors to CROP PROTECTION INSTITUTE, U. S. pat. 2,040,811, May 12, 1936. (A. P.-C.)

Grape Seed and Avocado Oils. Formulæ embracing the employment of these oils are given. These oils may be substituted in any cosmetic formula in which oil is an integral part.—ANON. *Perfumery Essent. Oil Record*, 27 (1936), 207. (A. C. DeD.)

Hand Creams—Progress in. Hand preparations may be divided into two categories, according to usage; namely, detergent preparations and those of a soothing, emollient type. The latter type may be classified into the two different physical groups; creams and lotions. The best known example of the lotion variety is the "Honey and Almond Cream." The formula used a decade or so ago and other formulæ with simpler variations are given. Typical formulæ for modern hand creams are also given.—S. P. JANNAWAY. *Perfumery Essent. Oil Record*, 27 (1936), 208. (A. C. DeD.)

Hypochlorite—Compound of, Suitable for Use as a Germicide. An alkaline-earth metal hypochlorite such as that of calcium is used with a solubilizing agent comprising an alkali metal phosphate such as a sodium phosphate which yields soluble compounds of the cation of the hypochlorite on the alkaline side of neutrality in aqueous solution.—ARNOLD H. JOHNSON and HENNING A. TREBLER, assignors to SEALTEST SYSTEM LABORATORIES. U. S. pat. 2,032,173, Feb. 25, 1936. (A. P.-C.)

Insecticidal Spray Materials. An insecticidal spray material is composed of an aqueous liquid having incorporated therein a compound of the type:

$$R_mPbX_n$$

in which R represents an unsubstituted hydrocarbon radical, X represents an acid radical, m represents at least 2, n at least 1, and $m + n = 4$.—WILLIAM S. CALCOTT, WENDELL H. TISDALE and ALBERT L. FLENNER, assignors to E. I. DU PONT DE NEMOURS AND CO. U. S. pat. 2,044,934, June 23, 1936. (A. P.-C.)

Insecticide. An insecticidal preparation composed of a relatively non-volatile petroleum oil, insecticidal material selected from the group consisting of rotenone and rotenoids, and an aryl alkyl ether, the amount of the latter being sufficient to keep the insecticidal material dissolved in

the petroleum oil.—HYVM E. BUC, assignor to STANDARD OIL DEVELOPMENT CO. U. S. pat. 2,042,296, May 26, 1936. (A. P.-C.)

Insecticide. A compound containing a petroleum fraction having a sulfonation value above 50, an emulsifying agent, water, and a compound selected from the group consisting of the chlorinated derivatives of diphenyl and diphenyl oxide, is claimed to possess insecticidal properties.—LINDLEY E. MILLS, assignor to THE DOW CHEMICAL CO. U. S. pat. 2,044,010, June 16, 1936. (A. P.-C.)

Insecticide. The product consists of a substantially water-insoluble mixture of the reaction products of an alkaloid toxic to insects, a dihydroxybenzene and an aldehyde.—WARREN MOORE, assignor to TOBACCO BY-PRODUCTS and CHEMICAL CORP. U. S. pat. 2,041,298, May 19, 1936. (A. P.-C.)

Insecticide. A solution of an oleoresin of pyrethrum in decalin is diluted with naphtha to precipitate dissolved resins. The solution is cooled, filtered and the naphtha removed from the filtrate by distillation.—CHARLES B. GNÆDINGER. U. S. pat. 2,042,712, June 2, 1936. (A. P.-C.)

Insecticides—Preparation of. A product adapted to serve as concentrate for a germicide, insecticide or parasiticide comprises a product which is the result of a chemical reaction between the toxic principles of herbs of the class including pyrethrum flowers and derris root, with a chemical compound of the alkylolamine family.—VANSTON H. RYAN and JAMES A. MORAN. U. S. pat. 2,043,267, June 9, 1936. (A. P.-C.)

Lipsticks. One essential in making a good lipstick is to keep the melting point as high as possible without interfering with the spreading qualities of the stick. The usual melting point range is 130–145° F. The following formula is offered: White beeswax 33 Gm., benzoinated lard 12 Gm., sesame oil 20 Gm., castor oil 29 Gm., perfume oil 0.2 Gm., tribromfluorescein 4 Gm. The dye is dissolved in the castor oil. Beeswax is used because of its texture and uniformity and shrinking properties during the process of molding, and by decreasing its amount the lipstick can be changed to a paste or cream rouge. The perfume oil should range from 1–4%. Sesame oil and lard are added as spreading agents. Various shades of pink and red can be obtained by the use of oil-soluble red, brilliant red, medium red lake and the pigment color should range from 5–10%. When pigment is added too severe hardening may be prevented by using a softer base or by grinding the pigment colors into the hot mass thoroughly, mix as the mass cools and thickens, then run through a mill one or more times to disperse the color thoroughly and then cast in brass molds made for this purpose.—ANON. *Drug and Cosmetic Ind.*, 38 (1936), 769–770, 779, 784. (H. M. B.)

Liquid Creams. These creams have definite advantages over solid creams: (1) Can be applied easily and uniformly over a large skin area, (2) permit use of small amounts of cream so important in foundation lotions. Difficulty in manufacture is to get a cream that will flow easily from the container and not so thin that it will run off of the skin before it is rubbed in. Most liquid creams are water-in-oil emulsions consisting of (*a*) mineral oil for cleansing, (*b*) vegetable oils, cocoa butter, lanolin and cetyl alcohol for softening the skin, (*c*) stearic acid and spermaceti as powder bases, (*d*) emulsifying agents such as soap, a fatty alcohol sulfate, a sulfonated soap or a gum, (*e*) an auxiliary emulsifying agent such as a fatty alcohol or a fatty acid. The following formulas are offered: (1) *Hand Lotion.*—Cetyl alcohol 3 parts *by weight*, lanolin 1, lactic acid 1, peanut oil 2, sulfated fatty alcohol 0.5, water 92.0 and perfume 0.5. Melt the cetyl alcohol, lanolin and oil at 50–60° C. and mix thoroughly with the sodium lauryl sulfate dissolved in $^1/_2$ the water at the same temperature. Stir thoroughly avoiding incorporation of air as much as possible. Cool somewhat, stir in the lactic acid dissolved in the rest of the water. (2) *Sun Tan Lotion.*—Stearic acid 1 part *by weight*, cetyl alcohol 1, screen 6, potassium hydroxide 0.1 and water 91.9. Prepare as in (1). Without the screen the preparation is ideally suited for use as a foundation lotion or powder base. (3) Stearic acid 5 parts *by weight*, mineral oil 25, triethanolamine 1, water 69.—JOSEPH KALISH. *Drug and Cosmetic Ind.*, 38 (1936), 771–772, 784. (H. M. B.)

Mosquito Larvicides. Use of kerosene-pyrethrum extract-coconut oil soap emulsion is described. The preparation is harmless to fish, fowl and plants, and is effective over 48 hours on water having less than 5% salinity. For very saline water a pyrethrum-cresylic acid-skim-milk emulsion is suitable. The preparations are less effective than is oil if water carries heavy surface

vegetation or sewage scum.—J. M. GINSBURG. *Proc. 21st Ann. Meet. New Jersey Mosquito Exterm. Assoc.* (1934), 121; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1167. (E. G. V.)

Nicotine Humate—A New Water-Soluble Insecticide. Nicotine peat and nicotine humate are companion products formed in the reaction of nicotine and peat. Nicotine humate is found in the aqueous portion and may be recovered in the form of a black solid by evaporating the water. It contains from 28 to 34% of nicotine, depending chiefly on the type of peat from which it is made. The yield is a function of the type of peat and its preliminary treatment and the ratio of peat to nicotine. The product has insectidal possibilities similar to those of commercial nicotine sulfate.—L. N. MARKWOOD. *Ind. Eng. Chem.*, 28 (1936), 648. (E. G. V.)

Paraffin Oil—Emulsions of, Stabilized by Soap. Homogeneous emulsions are obtained by adding 1 volume of water to 2 volumes of 1% gel of soap in lamp oil.—R. SPYCHALSKI. *Rocz. Chem.*, 14 (1934), 904; through *J. Soc. Chem. Ind.*, 54 (1935), B., 212. (E. G. V.)

Stains—Removing, from Teeth. The mucin film, to a depth at least as great as the objective stain, is impregnated with an iodine solution and then treated with a solution of sodium thiosulfate.—GILBERT D. LAYMON. U. S. pat. 2,031,169, Feb. 18, 1936. (A. P.-C.)

Sunburn—Composition for Preventing. A skin-protective substance for preventing sunburn containing menthyl salicylate is claimed as new.—FRITS E. STOCKELBACH. U. S. pat. 2,041,874, May 26, 1936. (A. P.-C.)

Tetrachloroethylene as an Anthelmintic. The drug is not effective for cattle and sheep.—R. E. S. SHULTZ and E. A. DAVTJAN. *Khim. Farm. Prom.*, No. 3 (1934), 44; through *J. Soc. Chem. Ind.*, 54 (1935), B., 828. (E. G. V.)

Tooth Pastes and Powders Dissolving Dental Tartar. A preparation contains calcium carbonate 10%, calcium phosphate 65%, magnesium carbonate 2–7%, ferric oxide 0.3%, organic matter 15%, water 7%. Binding of the material by the saliva is prevented by sulfo-oleates, etc.—WELWART. *Seifensieder-Ztg.*, 62 (1935), 22; through *J. Soc. Chem. Ind.*, 54 (1935), B., 1168 (E. G. V.)

Weed-Killers. An alkaline arsenical weed-killer is made thus: Arsenious acid, 16 oz.; sodium hydroxide, 16 oz.; water, 120 oz. Boil until clear, then dilute to one gallon. This concentrated preparation is diluted with nine parts of water before using. Each gallon of a diluted solution is sufficient for 4 square yards. A simpler method is the following: Dissolve $2^1/_2$ lbs. of granular caustic potash in 1 gallon of water in an open cask, and, by the aid of the heat generated during solution, dissolve in the caustic liquid $2^1/_2$ lbs. of arsenic, added gradually in small quantities, and add color. Dilute this concentrated solution to 25 gallons with water when required for use. An acid weed-killer is made as follows: Arsenious oxide, 15; spirits of salts, 50; water, 50. Boil together. When cool, dilute to 200 parts with water and add color. For use, the finished liquid is diluted with 10 times its volume of water. If small quantities are required, a colored solution of sodium arsenate, 1 lb., in water, 5 gallons, will provide an effective solution which can be rapidly prepared. Sodium chlorate sprinkled either dry or in solution, on garden paths at the rate of $^1/_2$ to 1 lb. for every sq. yard, is a useful non-poisonous weed-killer.—ANON. *Pharm. J.*, 136 (1936), 608. (W. B. B.)

DISPENSING

Acetylsalicylic Acid Solution—Method of Producing. A "potentiated" solution of acetylsalicylic acid is prepared by mixing solid acetylsalicylic acid and another solid analgesic and antipyretic drug with glycerin and applying sufficient heat to cause mutual solution only.—LOUIS HIRSCHHORN. U. S. pat. 2,040,848, May 19, 1936. (A. P.-C.)

Apomorphine Hydrochloride Solution—Preparation of, for Injection. The Spanish Pharmacopœial method gives the most stable solutions. Although present methods do not yield solutions which are permanently colorless, there is no loss of activity associated with the appearance of the green color.—DINO PONTE. *Giorn. farm. chim.*, 84 (1935), 53; through *Chem. Abstr.*, 29 (1935), 4517.

Calcium Gluconate Solution. A stable strong solution of calcium gluconate for injection may be prepared from the following formula: calcium gluconate, 60 Gm.; boric acid, 12 Gm.; water, 350 Gm. The author suggests that the addition of boric acid is permissible only for solutions intended for veterinary use.—S. SVENSSON. *Svensk Farm. Tids.*, 39 (1935), 550; through *Quart. J. Pharm. Pharmacol.*, 9 (1936), 145. (S. W. G.)

Chlorodyne—Retail Sale of. As the B. P. allows a downward limit of 5% of HCN in Acid Hydrocyan. Dil. (limits 1.9 to 2.1)—and it is by means of that preparation that HCN is introduced into Chlorodyne B. P. C.—it is possible either by *accident* or *design* to prepare chlorodyne which will be either within or without the First Schedule poisons, while still conforming to the requirements of the B. P. C. and relative B. P. standards.—E. T. HAYBALL. *Pharm. J.*, 136 (1936), 556. (W. B. B.)

Epinephrine—Neutral and Stable Solution of. The French Pharmacopœia contains a formula for an epinephrine solution having the following composition: epinephrine 0.1 Gm., sodium chloride 0.7 Gm., hydrochloric acid (33.6%) 4 drops, solution of sodium bisulfite 12 drops, and water 100 Gm. According to L. Julien (*J. pharm. chim.*, 2 (1935), 53) this solution has a p_H of 2.5 to 2.6 and is much too acid for subcutaneous use. In the French military hospitals a solution is used which is made up after directions by Debucquet and contains epinephrine 0.1 Gm., sodium chloride 0.7 Gm., and saturated solution of benzoic acid to 100 cc. Even this solution is quite acid, the p_H being about 3.6. A solution with a p_H of 6.2 (equivalent to the acidity of distilled water) may be prepared by Julien's directions as follows: epinephrine 1 Gm., sodium bisulfite solution (Sp. Gr. 1.33) 5 cc., sodium chloride 7 Gm., and distilled water to 1000 cc. If the epinephrine solution is to be filled into ampuls (and not dispensed successively from the bottle) 3 cc. of the bisulfite solution will be sufficient. The liquid then has a p_H of 6.6. If one wishes to adhere strictly to the pharmacopœial requirement and dissolve the epinephrine in hydrochloric acid, then one should only use a quantity of acid equivalent to the quantity of epinephrine. This is 5.45 cc. of *N* HCl per Gm. of epinephrine. If this quantity is added to the formula of Julien the liquid becomes much more acid, having a p_H of about 3.8.—*Pharm. Weekblad*, 73 (1936), 519. (E. H. W.)

Eye Drops—Preparation of, Contribution to the. The Swiss Phar. V directs the addition of sufficient boric acid to prescriptions written for borax in combination with alkaloidal salts to prevent or hinder a precipitation of the alkaloids. The authors selected for study various strength solutions of the alkaloids commonly used in eye drops. The results of amounts of borax varying from ½ to 5% are compiled in a table. Cocaine and physostigmine solutions were found to be unstable with even small amounts of borax. Since the addition of borax produces an alkaline medium and since the normal p_H range of tears is 7.15 to 7.35, the authors determined the amounts of boric acid necessary to bring the p_H of the solutions within this range. It was found that 5% cocaine hydrochloride solutions with a buffer of borax and boric acid, and solutions of ½% of physostigmine salicylate containing ½% of borax could not be prepared to fall in the optimum p_H range. Solutions of pilocarpine containing borax require less boric acid for adjustment than the other alkaloids. If the order—boric acid, pilocarpine hydrochloride, cocaine hydrochloride and borax—is followed, no precipitate of cocaine will occur in this preparation. In the presence of large amounts of borax (5%) solutions of homatropine hydrobromide, atropine sulfate and scopolamine hydrobromide undergo changes.—J. BÜCHI and E. BAESCHLIN. *Pharm. Acta. Helv.*, 11 (1936), 103. (M. F. W. D.)

Hypochlorite Solutions—Preparation and Preservation of, for Medicinal Use. The preservative values of potassium permanganate and sodium silicate vary with the nature of the preparation and are influenced by light. Breteau's solution is the most satisfactory.—J. E. MACHADO and J. SONOL. *Rev. sud-amer. endocrinol. inmunol. quimioterap.*, 17 (1934), 566; through *J. Soc. Chem. Ind.*, 54 (1935), B., 252. (E. G. V.)

Incompatibilities—Correctible Pharmaceutical and Chemical. The question of using correctives or making changes is discussed briefly and the twenty prescriptions are taken up individually. It is not possible to abstract these procedures further.—GEORGE L. SECORD. *J. Am. Pharm. Assoc.*, 25 (1936), 428. (Z. M. C.)

Mercury Ointment. It is suggested that, when "mercury ointment" is demanded, without a prescription, an effort should be made to find out from the customer whether it is the "strong" or the "mild" that is required. If the customer does not know, the B. P. strength should be dispensed and the buyer should be cautioned that it is not safe to rub it on the skin except under a doctor's orders. It should be labeled "Strong Mercury Ointment. Not to be applied to the skin except under medical supervision."—W. JOHNSTON. *Pharm. J.*, 136 (1936), 593. (W. B. B.)

Normal Drop Counters and Dropping Glasses. According to the Swiss regulations any prescription for potent drugs to be administered in drop doses are to be dispensed with normal

drop counters or graduated pipettes. For single doses of more than 10 drops it is permissible to dispense dropping glasses. The author ran a series of experiments using both types of drop counters with many of the official preparations which are administered in drop doses. The drop counters used met the pharmacopœial requirement of having a dropping surface 3 mm. in diameter. The results are compiled in numerous tables and show that in the case of water and 95% alcohol, the number of drops/Gm. were 25% fewer from dropping glasses than from the dropping pipettes, but in the case of pharmacopœial preparations there was observed little practical difference except in the case of fluid extract of ergot. Some differences were attributable to variations in the size of the dropping surface. The author suggests that the wording of the text be changed so as to make the use of the dropping pipette, which is more expensive, compulsory for preparations given in single doses of 1 Gm. or less rather than basing the ruling on the number of drops. A table showing the number of drops/Gm. of several preparations is appended.—J. THOMANN. *Pharm. Acta Helv.*, 11 (1936), 114. (M. F. W. D.)

PHARMACEUTICAL HISTORY

Borgerger Apothecaries—225 Years of. A historical account of the accomplishments and influences of this family of apothecaries.—ANON. *Apoth. Ztg.*, 51 (1936), 672–674. (H. M. B.)

Carl Wilhelm Scheele's Career in Sweden. Historical.—ZEKERT. *Apoth. Ztg.*, 51 (1936), 759–761. (H. M. B.)

Chemistry and Related Subjects—Former Times in. Classical and medieval practices in pharmacy, medicine and cosmetics are reviewed and related to modern superstitions.—F. KAISER. *Chem.-Ztg.*, 59 (1935), 488; through *J. Soc. Chem. Ind.*, 54 (1935), B., 700. (E. G. V.)

Early Drug Stores in Oklahoma. Some of the early history of the state as it pertains to pharmacy is described. Location and description of some of the stores and something of the owners themselves and some notable visitors make an interesting article. Pictures of some early stores are shown also.—LOYD E. HARRIS. *J. Am. Pharm. Assoc.*, 25 (1936), 436. (Z. M. C.)

Ergot—History of. KOFLER. *Pharm. Monatsh.*, 17 (1936), 84. (H. M. B.)

First Netherlandisch Pharmacopœia. The fifth of May 1936 is the 300th anniversary of the "Pharmacopœa Amstelredamensis," the first pharmacopœia produced in the Netherlands. The author discusses the history of this pharmacopœia; the pharmacopœias used in the Netherlands previous to it and its effect on the host of various Dutch Pharmacopœias which followed it. Excerpts from the Latin text of the dedication and introduction as well as a few typical (Latin) monographs are given. A medallion has been cast in honor of Nicolaas Tulp who was largely instrumental in the preparation of this early pharmacopœia.—P. VAN DER WIELEN. *Pharm. Weekblad*, 73 (1936), 545. (E. H. W.)

Gems and Precious Stones—Ancient Medicinal Uses of. The author writes in an interesting way on the subject of precious stones. Some of those mentioned are lapis lazuli, ruby, garnet, carnelian, bloodstone, emerald, sapphire, amethyst and diamond.—A. RICHARD BLISS, JR. *J. Am. Pharm. Assoc.*, 25 (1936), 544. (Z. M. C.)

Moses Maimonides—Physician and Author of Medical Works. A biographical sketch of a man who was philosopher, theologian, physician and astronomer with quotations at some length from his writings.—LOUIS GERSHENFELD. *J. Am. Pharm. Assoc.*, 25 (1936), 440. (Z. M. C.)

Pharmacopœia of 1808—The Massachusetts. The author gives a brief history of this book, considering it especially from the point of view that it is the logical background of the study of official pharmacy in the United States now that pharmaceutical history is a regular part of the curricula of colleges of pharmacy.—EDWARD H. NILES. *J. Am. Pharm. Assoc.*, 25 (1936), 542. (Z. M. C.)

Pharmacy in Mississippi. Some of the history of pharmacy in the State of Mississippi is traced from the time of the first meeting of the State Pharmaceutical Association in 1883 down to the present time. The first legislation was enacted in 1892 and the School of Pharmacy of the University of Mississippi was established in 1908. Names of men who have been responsible for the progress of pharmacy with their particular work are included.—LEW WALLACE. *J. Am. Pharm. Assoc.*, 25 (1936), 433. (Z. M. C.)

Robert Bunsen—125th Birthday of. Historical account.—HANS HEGER. *Pharm. Monatsh.*, 17 (1936), 81–82. (H. M. B.)

PHARMACEUTICAL EDUCATION

Educational Losses. Orientation examinations were given first at Purdue in 1926. The nature of these is briefly discussed. Results have been carefully watched for ten years. Instructors must not be too greatly influenced by these ratings because there is a sort of tradition among students that high scoring students are expected to do more than others and because instructors might be influenced favorably or unfavorably. They have a place but many other factors, such as determination and willingness to work, are important. In checking entering students with graduates over a period of ten years there has been a large loss. Entering students have been classified by decile groups. About 41 per cent fall into the three lowest groups. Experience has shown that those in the first and second decile have a difficult time in carrying the university work and those in the third do so if there is diligence and application. Another table gives a summary of students from 1926 to 1931, all of whom have graduated or left. About 45% of those who entered were graduated. Most of those entering before 1930 were in the three-year course. A loss of 55% does not indicate very high educational efficiency. However, nearly 30% of the lowest ranking students graduated while some of the higher grade did not. These facts are shown by table also. Conclusions are difficult and no explanation seems adequate. There should be some adequate means of selection. Teachers have a threefold obligation: to the student, the state and the profession. Time spent in selection might be better than salvage.—C. O. LEE. *J. Am. Pharm. Assoc.*, 25 (1936), 450. (Z. M. C.)

Micro-chemistry and Pharmacy. The author gives a brief discussion of the possibilities of micro-chemistry as applied to pharmacy.—R. WASICKY. *Scientia Pharm.*, 7 (1936), 65. (M. F. W. D.)

Pharmacy Entrant—1935 College of. The author directs attention to some of the changes that have taken place since the World War. Immediately thereafter there was a rush of all sorts of material into colleges of pharmacy, resulting in an overproduction. Colleges recognize the need for selection of students but when they are units of state-supported universities there are distinct limitations. A tabulation of students entering in 1924, 1925, 1934, 1935 was made on the basis of rating in intelligence tests. Comparison of 1924, the last year for admittance to the two-year course, and 1934 showed an increase of 16.88% of students in the upper two ranks (the whole number being in five groups). Comparison of 1925 and 1935, both years when the four-year course was in effect, showed an increase of 18.25% in the upper two groups for 1935. These ratings show what a student is supposed to be able to do. Comparison of grades made in high school and relative standing in high school classes is another means of measurement. The 1935 entering class was studied in this way, classifying into three groups; 12.5% were in the lower third, 41.66% in the middle third and 45.83% in the upper third. A study in relation to total number of graduates from high schools represented was made on a limited number and 10.71% were found to be in the lower third, 32.14% in the middle third and 57.14% in the upper third. It is believed that a better class of students is being attracted to the profession and that the four-year course has been of marked benefit.—R. L. MCMURRAY. *J. Am. Pharm. Assoc.*, 25 (1936), 448. (Z. M. C.)

Physician and Pharmacist. The relation of physician, pharmacist and public are discussed and attention is directed to some of the most important duties of pharmacists, if pharmacy is to be maintained as an essential factor in public health.—RALPH W. CLARK. *J. Am. Pharm. Assoc.*, 25 (1936), 529. (Z. M. C.)

Physiology for the Pharmacist. An address on the value of physiology to the pharmacist.—J. H. BURN. *Pharm. J.*, 136 (1936), 527. (W. B. B.)

Students—Testing the Recognition Faculties of. Teachers must try to make "an examination that is representative of the work covered during the year or term, that stimulates some original thought, and that does not destroy the chance of a last favorable impression of the subject; moreover, the examination should be one that does not mark the course as a 'snap,' and that is not too short or too long for the student of average ability to answer in the time allotted." There are two basic types of questions, the recollection type and the recognition type. The latter form is discussed at some length. Because true-false examinations fail primarily because they do not set

up inhibitions to the guess impulse, the author experimented with a modified form which he believes overcomes more than half the usual weaknesses. Illustrations of this form are given with rules for grading. The relative effectiveness of this form of test was measured and it was found to be more than twice as accurate as the old true-false examination. Limitations and cautions are discussed also.—JOSEPH H. GOODNESS. *J. Am. Pharm. Assoc.*, 25 (1936), 536. (Z. M. C.)

PHARMACEUTICAL LEGISLATION

Pharmacy in Mexico. Pharmacists in Mexico are in two groups, the professional (college trained) managing five % of the pharmaceutical establishments and the non-professional (without college training) managing the remainder. Legal regulations are difficult to get, the non-professional group arguing that restrictions on their group are unconstitutional. The Health Department controls licensing of both groups but the most that has been accomplished yet is to require that each establishment must have a sign in a visible place stating whether the manager is a graduate pharmacist or not. These conditions and others hinder progress of pharmacy.—G. G. COLIN. *J. Am. Pharm. Assoc.*, 25 (1936), 533. (Z. M. C.)

MISCELLANEOUS

Cosmetics—Preservatives for. Esters of *p*-hydroxybenzoic acid are recommended for preservatives in cosmetics and pharmaceuticals. They are much more potent than phenol, the potency increasing with the size of the alcohol radical: methyl, ethyl, propyl, butyl, benzyl. The esters are non-poisonous, soluble 1–20% in 30–70% alcohol, up to 25% in acetone, fats and oils 2–3%, glycerin 0.05–1.5%, water (20° C.) 0.01% (benzyl)—0.25% (methyl). The esters are white crystalline powders. They have been adopted by the Pharmacopœia Helvetica V for a number of preparations. A table is included which lists the quantities of each of the esters required for numerous pharmaceutical and cosmetic preparations.—ALBERT SUESS. *Am. Perfumer*, 52 (1936), 55–57. (G. W. F.)

Dielectric Constants—Application of, in the Examination of Pharmaceuticals. During the last few years the application of physical constants to the investigation of the purity and molecular state of chemical products has become more and more prevalent. These methods often have the advantage over the ordinary methods of chemical analysis in saving considerable time. This has led to the construction of new apparatus. The author sets out to discuss the idea of dielectric constants, the principle and operation of the apparatus for measuring dielectric constants (the apparatus of Prof. Ebert is used), the connection between D. C. (dielectric constant) and molecular state and the practical application of the D. C. in the examination of pharmaceuticals. In connection with the latter he also discusses the results of other workers, and of other methods, for comparison. The D. C. of a substance is the factor by which the capacity of a condenser is multiplied when the space between the plates is entirely filled with the substance. Two measurements are made. The first is made on a vacuum, for which air may be substituted (the D. C. of air at 20° and 760 mm. is 1,000.585) and the second on the material under investigation. In practice the first measurement, *i. e.*, that for a vacuum or air, is made on a substance of known D. C. The D. C. of the unknown is then calculated by the following formula:

$$\text{D. C.} = \frac{C_2}{C_1} \; E_0$$

where C_2 is the capacity of the condenser with the unknown, C_1 the capacity with the known and E_0 the dielectric constant of the known. The structure and working of the Ebert Dielcometer is discussed as is also the relation between D. C. and molecular state. According to the author the determination of the D. C. has many advantages over the determination of other physical constants; it is much faster; it is the only physical constant which may be determined on flowing liquids and is thus advantageous in the control of distillation processes, and it is, for many materials, a much better criterion of purity than are other physical constants. For the pharmaceutical application of this method the following are discussed together with analytical data obtained both with the D. C. method and the customary methods: (1) The determination of moisture in liquids, such as oils, and the determination of moisture in powders; (2) the determination of the purity of liquids; (3) the determination of the size of particles in powders and (4) the control of distillation processes. Tables of dielectric constants of fixed oils, volatile oils and various sol-

vents are given as are also methods for the determination of age and keeping quality of oils. Data is given for the determination of adulterants in volatile oils among which are clove oil adulterated with oil of turpentine, oil of peppermint adultered with oil of sassafras and cypress oil adulterated with oil of turpentine. A method for the control of boiling point in distillation is described, as is also a method for the determination of sedimentation speed of powders.—IR. B. VAN STEENBERGEN. *Pharm. Weekblad*, 73 (1936), 244. (E. H. W.)

Gelatin—Pressed Foam. Gelatin liquor is passed through a baffle-type emulsator to obtain a foam; the foam layer is then chilled on a plane surface, dried *in situ*, and then compressed. The sheets are white, and though not fragile they can readily be disintegrated and powdered.—S. E. SHEPPARD and J. H. HUDSON. *Ind. Eng. Chem.*, 28 (1936), 422. (E. G. V.)

Gentian Powder of the Belgian Pharmacopea IV. A discussion of the requirements and assay of gentian powder as specified in the Belgian Pharmacopea IV.—F. STERNON. *Congrès de Pharmacie (Liège 1934)*, (1935), 224–232; through *Chimie & Industrie*, 35 (1936), 892. (A. P.-C.)

German Bezoar or Goat Stones. Historical.—FRIDO KORDON. *Pharm. Post*, 69 (1936), 261–265. (H. M. B.)

Honey Fermentation. Honeys containing less than 17.1% of water will not ferment in 12 months, irrespective of the yeast count. With more than 20% of water fermentation is always possible. Additions of 0.025–0.05% of sodium benzoate to samples containing 19% of water prevented spoilage during 2 years, without affecting color or flavor. Sodium sulfite and bisulfite (0.01–0.025%) prevented fermentation, but caused undesirable darkening.—A. G. LOCHHEAD. *Prog. Rept. Dominion Agric. Bacteriologist for 1931–1934* (1934), 12; through *J. Soc. Chem. Ind.*, 54 (1935), B., 379. (E. G. V.)

Hospital Dispensary—New, Preliminary Planning for a. A discussion of problems confronting the erection of a hospital dispensary. Among topics discussed are: apparatus, floors and benches, filtered air and pharmaceutical machinery.—F. G. HOBART. *Pharm. J.*, 136 (1936), 591. (W. B. B.)

Modern Face Cream Production. The production of face cream including the various types such as cold and cleansing creams, hand and massage creams, and the so-called skinfoods is discussed.—G. COLLINGRIDGE. *Perfumery Essent. Oil Record*, 27 (1936), 196. (A. C. DeD.)

Oakmoss. Used by the ancient Egyptians, oakmoss (*Evernia prunastri* Ach. and *E. furfuracea* Fr.) is an important odoriferous substance for perfume industry. The lichen contains orcin-monomethylether, beta-orcin-carbonic acid methyl ester, everninic acid, and evernic acid. Oakmoss is used as a base for numerous perfumes, in creams, soaps, etc.—K. BOURNOT. *Am. Perfumer*, 32 (1936), 65–66. (G. W. F.)

Odor—Sense of, Dipolar Theory of the. A preliminary study of a dipolar theory including osmoceptors, semi-osmophor, dipole-moments is discussed.—ARNO MULLER. *Perfumery Essent. Oil Record*, 27 (1936), 202. (A. C. DeD.)

Postage Stamps and Medicine. The authors discuss postage stamps which bear likenesses of physicians or have medical subjects incorporated into their design. Thirty-one stamps are illustrated and several more are discussed. The article is of especial interest to pharmacists who are philatelists.—L. VAN WERSCH and W. H. WOLFF. *Pharm. Weekblad*, 73 (1936), 726, 733. (E. H. W.)

Rosin—Production of Clean Gum. All gum rosin now produced contains a small quantity of dirt. The methods by which a clean rosin may be produced are (1) removal of the dirt from the rosin, (2) production of raw material initially free from foreign matter and water, (3) removal of foreign matter, including water, from commercial gum before distillation. At present the third of these methods appears to be the most practical. Laboratory tests show that it is necessary to remove from the gum not only all the solid extraneous matter, but also all of the water, which contains certain substances in solution. This aqueous solution must be removed before filtration of the gum or immediately thereafter.—W. C. SMITH. *Ind. Eng. Chem.*, 28 (1936), 408. (E. G. V.)

Soap—Cleansing Action of, New Views on. A new method for determining p_H values, densities and "elasticities" of detergent solutions has been tried in some 300 hygienic washing places and laundries in Czechoslovakia, and it is found that the cleansing of soiled linen is best carried out in a medium of p_H value 11–12. A soap solution with this alkalinity acts as a pepton-

izer or protective colloid to the emulsion formed from the fat or other foreign matter with the soap. It is contended that the detergent action is dependent upon simultaneous chemical and biological effects together with suitable mechanical aid to secure uniform and rapid action. It can be contrasted with the complimentary process of dyeing in which colors are affixed to textiles. The processes may be regarded as identical in principle, except that in cleansing the solution contains substances which act in the dissociated state, while the dye acts in the undissociated condition. The density and "elasticity," as the author terms viscosity, must be within definite limits and should not decrease when temperature is raised. The soap should be sterile and has been made from fats or oils free from rancidity. It should contain no calcium or "lime soap." The expectation that solutions are alkaline as p_H 11 or 12 would act deleteriously upon the fabrics being cleansed is shown to be unfounded. Such action appears to be controlled by the buffering effect of other components. The best results can only be obtained with soaps free from excess of fat or oil.—L. ZACHARIAS. *Chem. Obzor.*, 10 (1935), 226; through *Pharm. J.*, 136 (1936), 534. (W. B. B.)

Stock Jars for Ointments—Study of the Transparency to Light. The author has investigated the penetration of light into the usual commercial stock ointment jars using the method he previously reported in *Schweiz. Apoth.-Ztg.*, 74 (1936), 113. The results are compiled in a table. Many types were found to transmit light freely. Those made by Langenthal of a gray-green porcelain kept out the light remarkably well.—A. KAELIN. *Schweiz. Apoth.-Ztg.*, 74 (1936), 329. (M. F. W. D.)

Validol—Examination of. The acid value should be included in the characteristic constants of Validol (30% solution of menthol in menthol isovalerate).—S. M. BOLOTNIKOV and M. S. SCHRAIBER. *Farm. Zhur.* (1934), 182; through *J. Soc. Chem. Ind.*, 54 (1935), B., 828. (E. G. V.)

Wine—"Tourne" Disease of. "Tourne" is destroyed by pasteurization at 82.2° for 1 minute or at 60° for 5 minutes. Tannin in sufficient concentration to inhibit growth gives an astringent flavor. 75 p. p. m. of sulfur dioxide checks growth.—W. V. CRUESS. *Fruit Products J.*, 14 (1935), 198, 219; through *J. Soc. Chem. Ind.*, 54 (1935), B., 520. (E. G. V.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Adrenaline and Acetylcholine—Synergy of, on the Pulmonary Blood-Vessels in the Rabbit. Acetylcholine can produce powerful constriction of the pulmonary blood vessels in the rabbit, the amount depending upon the initial tone of the blood vessels. After repeated injections of acetylcholine the muscle fails to respond but the sensitivity may be restored by epinephrine, barium or histamine. The authors suggest that the major changes in the calibre of the pulmonary artery and arterioles of the rabbit are brought about through parasympathetic activity.—G. HAROLD ETTINGER and G. EDWARD HALL. *Quart. J. Exptl. Physiol.*, 25 (1935), 259; through *Squibb Abstract Bull.*, 8 (1935), A-1898.

Amino Acids—Effect of Various, on Motility of Excised Segments of the Small Intestine. Aspartic and glutamic acids depress the tone and movements of segments of the duodenum, jejunum and ileum. Alanine and phenylalanine exert only a slight temporary decrease; tyrosine is ineffective, whereas leucine and tryptophane produce a slight increase in tone. The action may be explained by a shift of the p_H.—LOUIS WEINSTEIN and GEORGE R. COWGILL. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 512. (A. E. M.)

Androsterone—Relation between Site of Injection of, and Comb Response. Injections of androsterone directly into the capon's comb produced a response greater than that elicited by the same dose intramuscularly. In tests on intact birds, 2 females responded to the treatment with less increase in the comb size than the capons but with well-marked swellings at the base of the comb. A normal male showed no reaction and an incompletely castrated male gave a marked response.—A. W. GREENWOOD and J. S. S. BLYTH. *Quart. J. Exptl. Physiol.*, 25 (1935), 267; through *Squibb Abstract Bull.*, 8 (1935), A-1889.

Anti-pernicious Anemia Liver Extracts—Bioassay of, Modified Pigeon Method for. 1. By the use of a wet mount technic for staining reticulocytes 96 to 99.5% of the erythrocytes of the grain-fed pigeon were shown to contain reticular material in their cytoplasm. 2. The amount of reticular material in the red blood cells of the grain-fed pigeon is stable within certain

definite limits for approximately 95% of the members of this species examined. 3. In sufficient dosage, four different parenteral liver extracts known to be effective in pernicious anemia increased significantly the amount of reticular material in the red blood cells of the grain-fed pigeon. The reticulogenic effectiveness of one of the liver extracts was found to be considerably reduced by prolonged heat treatment. 4. Congo red, *l*-tyrosine, and physiological saline were non-reticulocytogenic for the pigeon. 5. Extracts of defatted hog stomach and of normal human urine were reticulocytogenic for the pigeon, although they are therapeutically ineffective when administered parenterally in pernicious anemia. 6. Despite a certain lack of specificity shared also by the rat and guinea pig methods, the modified pigeon procedure outlined is recommended for testing the potency of anti-pernicious anemia liver extracts, until a method superior to all three is found. 7. The modified pigeon method offers certain quantitative possibilities.—G. E. WAKERLIN, H. D. BRUNER and J. M. KINSMAN. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 146.

(H. B. H.)

Barbiturates—Effect of, on the Rate of Sedimentation of Red Blood Corpuscles. By means of a new micro sedimentation technic the effect of evipal, sodium barbital and sodium amytal on the sedimentation rate of red blood corpuscles was studied in male and female dogs. The blood was drawn from the saphenous vein and 1 drop of a 20% solution of potassium oxalate per 2 cc. of blood was used as the anticoagulant. On each sample of blood triplicate sedimentation tests were run along with a hematocrit determination. Twelve experiments using six male dogs and six females were run using 45 mg. per Kg. of evipal injected intravenously. Control determinations on the experimental dogs (after twenty-four-hour fast) were run over a period of two to three hours to determine the normal variations in the sedimentation rate. At the conclusion of the control period the dogs were injected with evipal and within 13 to 28 minutes a definite increase in the sedimentation rate was noted along with a decrease in the cell volume. At approximately one to two hours after administration of the evipal, the blood sedimentation rate and cell volume returned to normal. In a similar way, six dogs (3 males and 3 females) were run on 190 mg. per Kg. of sodium barbital injected intraperitoneally. An increased sedimentation rate and decreased cell volume was observed in one hour with a return to normal in five to seven hours. When 55 mg. per Kg. of sodium amytal were injected intraperitoneally in ten dogs (7 males and 3 females), a definite increase in the sedimentation rate and decrease in cell volume was noted in one hour with a return to normal in six to ten hours.—RALPH I. DORFMAN and CLYDE BROOKS. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 119. (H. B. H.)

Chinese Drugs—Study of Seventeen, Reputedly Antipyretic. Seventeen Chinese drugs reputed to lower body temperature, were tested on white rats fevered with 15% yeast injected subcutaneosly. Of these, *Justicia Gendarussa* (Ch'in Ch'ui) and *Lophatherum elatum* (Tan-chu-yeh), showed significant results. Ch'in Ch'ui, in 16% alcohol extract, 1 to 2 Gm. per Kg. raised the temperature of rats 0.5° C. or more. Four grams per Kg. prevented the depression shown in 16% alcohol controls. Ten to 20 grams lowered the temperature, respectively, 2.0° and 3.3° C., caused a violent diarrhea, and death, respectively, in 48 and 24 hours. The decoction was only slightly pyretic. Tan-chu-yeh in 16% alcohol extract was inert. The decoction was consistently antipyretic in doses from 1 to 20 grams per Kg. The 20-gram dose lowered the temperature 3.3° C. in 90 minutes and in seven hours the temperature was still 1.0° C. sub-normal. The animals showed slight diarrhea, otherwise, remaining healthy. The following drugs showed no significant temperature effects: *Picrorhiza Kurroa Roylei, Lactuca laciniata, Aster fastigiatus, Sagittaria sagitifolia, Benincasa cerifera, Sargassum siliquastrum, Smilax China, Orixa japonica, Imperata arundinacea, Fritillaria verticillata, Artemesia capillarsis, Daphne Genkwa, Aneomne cernua, Pæonia Moutan* and *Anemarhena asphoideloides*.—LOUISE G. HUTCHINS. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 129. (H. B. H.)

Cobra Venom—New Data on the Physiological Action of. A study of the action of cobra venom by means of the piezograph. In a normal man cobra venom exerts a hypotensive effect due to the peripheral vaso-dilatation which it produces, probably by acting on the metasympathetic independently of the vagus; after a light phase of initial vaso-constriction, there is a secondary vaso-dilatation 5 to 10 min. after injection, revealed both by increase in the amplitude of systole and by the increase in the slope coefficient thus demonstrating its elective action on the capillaries. In diseased subjects, cobra venom, in doses of 0.05 mg., also produces a vaso-

dilatation bearing electively on the capillaries, independently of any bradycardia.—N. T. KORESSIOS. *Progrès Médical* (1935), 1741–1745; through *Chimie & Industrie*, 35 (1936), 1375.

(A. P.-C.)

Coriamyrtin—Pharmacological Action of. From the leaves of *Coriaria myrtifolia*, coriamyrtin has been isolated. It melts at 223° C. Its analytical data agree with the formula $C_{15}H_{18}O_6$. There is evidence that the substance is a glucoside. In amphibians and mammals, it causes convulsions in small doses. The minimal convulsive doses and the minimal lethal doses in frogs, rats and rabbits are as follows:

Animal	Administration	Minimal Convulsive Dose Mg. per Kg.	Minimal Lethal Dose Mg. per Kg.
Frogs	Subcutaneous	1.0	10.0
	Intravenous	0.2	0.7
Rats	Subcutaneous	0.3	1.0
	Intravenous	0.14	0.4
Rabbits	Subcutaneous	0.3	1.2

Preliminary results indicate that there is a mutual detoxification *in vivo* between coriamyrtin and certain barbiturates.—EDWARD E. SWANSON and K. K. CHEN. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 144. (H. B. H.)

Deuterium Oxide—Effects of, on the Respiratory and Water Exchanges of Mice. Ovariectomized 80- to 120-day mice were kept at 28° C., in an open metabolism train collecting water in a CO_2-cooled condenser. Feces and urine were separated under oil. Water or D_2O was given three times daily subcutaneously or per os. One cubic centimeter per 10 Gm. per day of 99.5% D_2O is fatal in about 7 days, when the body becomes from 40 to 50% saturated. Specific gravity of insensibly lost water agrees with post-mortem determinations. Double or half the above dosage kills at a lower total; the latter only because total water intake is inadequate, as proved by giving 25% D_2O. With the above dose a pilomotor response the first day is followed by anorexia and weight loss. About the fourth day the metabolism (6-hour runs) begins a decline attaining before death one-fifth the normal level. Marked jumping reflexes develop about the fifth day, followed by temperature fall to 30° C. Water mice reduced to the same food intake show decreases in temperature and metabolism about 2 days later than the D_2O mice, but no pilomotor changes or jumping. The water/CO_2 ratio is usually slightly lower at first. Large doses of D_2O cause greater water retention than like doses of water. Oliguria usually appears late.—H. G. BARBOUR and JANE TRACE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 113.

(H. B. H.)

Digitalis—Determination of the Average Lethal Dose in the Biological Assay of, by the Frog Method. The results of the experiments are given in the form of tables and graphs. The following summary is given: (1) The table given in the British Phar., 1932, of relative doses corresponding to a given percentage mortality of frogs (*R. temporaria*) does not apply to the *R. temporaria* used in the present work. Under the experimental conditions described (constant temperature) these frogs, which from the mode of taking must at the outset be assumed to be very homogeneous, showed a steeper characteristic curve with considerably less standard deviation than the English curve. (2) The average lethal dose (LD50) can be estimated with great accuracy on 30 (in exceptional cases 40) frogs by means of a mortality curve valid for these frogs. (3) A method of calculation is given for the determination of LD50, based on the smoothing of a linear function by the method of least squares. (4) "Summer frogs" are considerably more resistent to digitalis than "winter frogs."—KNUD O. MØLLER. *Quart. J. Pharm. Pharmacol.*, 9 (1936), 7–22. (S. W. G.)

Digitalis and Digitalis Bodies—Action of, Studies upon the Persistence of. Four tinctures of digitalis, three specimens of Verodigen (gitalin-Kraft) and one each of ouabain, digitoxin and g-strophanthin were assayed biologically upon pigeons by slow intravenous infusion. The characteristic response of pigeons to digitalis has been noted in several papers, and biological values so obtained have been compared with similar units secured from the use of cats and also clinical dosage in man. For the purpose of studying persistence of effect a series of pigeons was injected with 75 per cent of the M. L. D. (40% in the case of digitoxin) and then, at various intervals, the

amount of the same preparation necessary to produce death was established. Many deaths, some after several days, occurred with these primary doses, thus reiterating the importance of the time factor in studying digitalis potency. Because of the availability of pigeons as experimental subjects, criticism of previous endeavors based upon the paucity of experimental data could be obviated. The four tinctures showed practically no persistence after five days, and ouabain none after five days. In the case of Verodigen, persistence was noted up to about two weeks, strophanthin about three weeks and digitoxin even longer.—H. B. HAAG. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 125. (H. B. H.)

Digitalis and Ouabain—Toxicity of, Influence of Rate of Intravenous Injection upon. Bennefeld (Inaug. Diss. Göttingen, 1881, U. S. Army Medical Library) introduced a method of comparison of digitalis tinctures by repeated intravenous injection in rabbits to the point of cardiac stoppage. Hatcher and Brody (1913) used the cat, more nearly continuous injection, average death time about 90 minutes, and ouabain to terminate digitalis assays. Rowntree and Macht (1916) discontinued such use of ouabain. Magnus (de Lind van Wijngaarden, 1926) shortened assay time to 30 to 55 minutes. The authors find in cats that at shorter assay times, which are produced by increasing rates of injection per Kg. per minute, mean lethal doses of digitoxin, ouabain and 8-hour absolute alcohol extract of International (1926) and British (1928) Standard Digitalis Leaves significantly increase, while that of the aglucone, digitoxigenin, falls, *i. e.*, its apparent toxicity rises. At average death time of 90 minutes the toxicity of digitalis and ouabain varies little, and digitoxigenin has a lower toxicity; at 30- to 55-minute death times, both factors have greatly enhanced importance. It is suggested therefore that Hatcher's 90-minute average death time is probably superior to the time specifications of Magnus for the cat method of assay of cardiac glucosidal preparations.—B. J. VOS and W. T. DAWSON. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 145. (H. B. H.)

Drugs—Sublingual Absorption of. Previous studies emphasizing the fat-water solubility coefficient as a determining factor in direct and oral absorption have been extended to an additional group of drugs. Erythrol tetranitrate, in sublingual doses ranging from 32 to 64 mg., produced moderate but consistent diminutions in blood pressure with normal human subjects. Blood pressure effects lasted from 30 to 120 minutes and were usually associated with definite subjective effects such as headache and weakness. In dogs, the following doses have been found to be approximately equal in degree of effect: Picrotoxin, sublingual, 4.0 mg. per Kg.; subcutaneous, 0.75 mg. per Kg.; by stomach tube, 6.0 mg. per Kg., each dose producing convulsions in about 50 per cent of the trials. Sodium 1-methyl-butyl methallyl barbiturate, sublingual, 40 mg. per Kg.; by stomach tube, 50 mg. per Kg., each dose producing anesthesia. (Stomach tube doses with both these two drugs are substantially slower in action than the sublingual doses.) Hydrocyanic acid, used as the U. S. P. VIII 2% aqueous solution, sublingual, 0.4 mg. per Kg.; intravenously, 0.1 mg. per Kg., each dose producing marked stimulation of respiratory movements in an anesthetized dog. Aqueous and 40% alcohol solutions were about equally effective when used as vehicles for the sublingual administration of diacetylmorphine and strychnine. Diacetyl morphine effects were measured by augmentation of tone in Thiry fistulæ and strychnine effects by hyperexcitability and convulsions.—ROBERT P. WALTON. *J. Pharmacol. and Exper. Therap.* 57 (1936), 148. (H. B. H.)

Ergotocin, Ergometrine, Ergostetrine and Ergobasine. There has been considerable discussion concerning the status of the new ergot principle which has a prompt oxytocic action and which is effective when given by mouth in small doses. Due to certain differences in physical constants and chemical composition, four names have been proposed: ergotocin, ergometrine, ergostetrine and ergobasine. The four products were all made into maleates, and assayed by the isolated rabbit's uterus, the cock's comb and the colorimetric methods. In each instance, ergo-

Maleate of	Isolated Rabbit's Uterus Method, Per Cent	Cock's Comb Method, Per Cent	Colorimetric Method, Per Cent
Ergotocin	100	100	100.0
Ergometrine	100	100	96.1
Ergostetrine	100	100	100.0
Ergobasine	100	100	96.1

tocin maleate served as the standard. The results show that there is little or no difference between the four substances.—K. K. CHEN, EDWARD E. SWANSON, E. C. KLEIDERER and G. H. A. CLOWES. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 117. (H. B. H.)

Eritryna Corallodendron—Pharmacological Action of. This Brazilian drug causes general depression in cold and warm-blooded animals, motor paralysis of central origin in frogs, motor and sensory depression of similar origin in rabbits, and death by respiratory paralysis. There is no effect upon the isolated frog heart. After intravenous injection the mammalian heart *in situ* suffers diminution in frequency ending with complete arrest, and in the rabbit there is a progressive decrease in blood pressure. Small doses produce an increase in respiratory frequency and amplitude in the rabbit; large doses cause paralysis. Small doses increase the contractions of isolated rabbit intestine more than the tonus. Large doses decrease and finally stop the contractions.—ITALO SIMON. *Arch. farmacol. sper.*, 59 (1935), 193; through *Chem. Abstr.*, 29 (1935), 4446.

Esters, Genalkaloids and Glucosides—Action of, on Neuromuscular Excitability. The action of methyl, ethyl, propyl and butyl formates and acetates, genatropine, geneserine, genomorphine, genhyoscyamine, genoscopolamine and genostrychnine on the frog was studied by means of chronaxic measurements. The esters all have a similar action on the gastro-enemian sciatic nerve, resulting in a very considerable fall in chronaxia (50 to 75% of the normal value) and a consecutive considerable increase in excitability. On the muscle, at the start there is always a slight increase in chronaxia, which is maintained in the case of formate and acetate, but is followed by a decrease in the case of the other esters. The toxicity increases with the molecular weight in accordance with Richardson's law, in the case of the formates; the formate radical seems to be a specific poison of the muscle, but not of the nerves. In no case did the genalkaloids produce any curarizing action; they possessed the same properties as the alkaloids from which they were derived. Glucosides (tannin and saponin) decreased the chronaxia of both nerves and muscles, the second being the more active.—J. E. LOBSTEIN. *Congrès de Pharmacie (Liège 1934)*, (1935), 107–109; through *Chimie & Industrie*, 35 (1936), 890–891. (A. P.-C.)

Estrogenic Hormone—Effect of, Administration upon the Nasal Mucous Membrane of the Monkey. Estrogenic substance is effective when applied on the nasal mucosa of monkeys.—HECTOR MORTIMER, R. P. WRIGHT, CARL BACHMAN and J. B. COLLIP. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 535. (A. E. M.)

Ethyl Stearate—Action of, on Experimental Tuberculosis of the Guinea Pig. If guinea pigs infected with a virulent type of human tuberculosis are given 0.2 cc. of ethyl stearate subcutaneously bi-weekly it is observed that the tuberculosis does not evolve to the same degree as with non-treated control animals. The same results are observed when the guinea pigs have been infected with tuberculosis bacilli of the bovine type.—LEOPOLD NEGRE, ALBERT BERTHELOT and JEAN BRETEY. *Compt. rend.*, 202 (1936), 1816. (G. W. H.)

Eupaverine—Experimental Investigation in Relation to Papaverine and Visammin. The following conclusions are given: (1) Eupaverine, $C_{19}H_{15}O_4N$, has the M. L. D. 60 mg. per Kg. of body weight of dog in 55 minutes intravenously. This is regardless of any precipitation of eupaverine that may take place in the body of the animal. Papaverine hydrochloride has the M. L. D. of 40 mg. in 35 minutes similarly calculated. (2) In the toad, rabbit and dog, eupaverine depresses the heart by direct action on muscle. In the rabbit the coronary arteries dilate. In the dog and rabbit respiration is accelerated in the beginning, while in the dog the effect on blood-pressure is an early fall with an increase in intestinal volume. In small doses, the acceleration of heart beat, from central vagal depression caused by the early fall in blood-pressure, compensates for the vasodilatation and the blood-pressure quickly returns to normal. With large doses, the vasodilatation and cardiac depression overshadow the acceleration of heart beat and low blood-pressure persists. With fatal doses, death is preceded by asphyxia and respiration is arrested before the heart. (3) Eupaverine relaxes all smooth muscle investigated, by direct action on the muscle fibres—toad's blood-vessels, rabbit's intestine, guinea-pig and rabbit's uteri, gall-bladder and bile duct of dog, ureter of bull and of man, and the dog's bladder—but the degree of action varies greatly. For their power of antagonizing the effect of the barium ion on plain muscle tissue, eupaverine, papaverine and visammin in the same concentration show the following results: (*a*) Eupaverine is most efficient for the intestine. (*b*) Papaverine is most efficient for the uterus.

(*c*) Visammin is most efficient for the ureter. (*d*) Visammin and papaverine are of equal values for the gall-bladder, bile duct and urinary bladder, and are more efficient than eupaverine. As with visammin and papaverine, so with eupaverine, spasm of these plain muscle tissues is relieved if the spasm is mediated through the nerve, muscle or both, whereas atropine fails to relax these organs if the cause of the spasm is directly muscular. (4) The apparent low toxicity of eupaverine as compared to papaverine is an advantage in therapeutics, while problems in relation to its insolubility may be a disadvantage.—KARAM SAMAAN. *Quart. J. Pharm. Pharmacol.*, 9 (1936), 23–36. (S. W. G.)

Fish Liver Oils—Antirachitic Activity of, and Other Sources of Vitamin D for the Chicken and the Rat. Blue fin, yellow fin and striped tuna liver oils contain a vitamin D or mixture of antirachitic vitamins which is definitely less active than the D from cod liver oil for the chicken. The samples, which were tested, appeared to be about one-half as active as cod liver oil, unit per unit. Swordfish, halibut, mackerel and different cod liver oils appeared to contain vitamin D of about the same activity for the chicken. Irradiated cholesterol D was equal to that from these oils. Irradiated phytosterol, or unsaponifiable matter from the plant product, alfalfa, compared closely to irradiated ergosterol for the chicken.—A. BLACK and H. L. SASSAMAN. *Am. J. Pharm.*, 108 (1936), 237. (R. R. F.)

Hormones and Pregnancy. The properties of the hypophyseal and gonadic hormones produced during pregnancy and responsible for changes which then occur are briefly described. The concentration of hormones in the urine, the blood, the placenta and the pituitary during pregnancy is reviewed in the human being, certain higher primates, the mare and some other animals. The relation of the sex hormones to the alterations occurring during gestation in various species is discussed; an attempt is made to evaluate their significance in the process responsible for the maintenance of pregnancy and initiation of parturition.—J. M. ROBSON. *Brit. Med. J.*, 3933 (1936), 1033. (W. H. H.)

1-m-Hydroxyphenylethanolmethylamine Hydrochloride—Effects of, on the Bronchial Musculature of Rabbits and Guinea Pigs. Changes in lung-lobe volume were recorded in urethane-anesthetized rabbits by the method of Brodie and Dixon (36 experiments) and also by the method of Jackson (6 experiments). The results are essentially the same by either method. One-fourth milligram of the drug in 1 cc. of Ringer's solution injected into a jugular vein causes a marked rise in general arterial blood pressure, but no change in lung-volume. The subsequent injection of 0.1 mg. of histamine produces contraction of the smooth muscle of the lung as recorded by a diminution of the lung-lobe volume. Relaxation of the bronchial-muscles is not hastened by the injection of as much as 5 mg. of 1-*m*-hydroxyphenylethanolmethylamine hydrochloride, even when injected during the height of the constriction. Doses yielding maximal effects upon blood pressure (2 mg.) and doses up to 10 mg. do not prevent histamine-contraction of the bronchial musculature, and are ineffective in causing relaxation when bronchial-contractions are initiated by histamine. The effects of the drug upon blood pressure are similar to those caused by ephedrine. Very high concentrations of 1-*m*-hydroxyphenylethanolmethylamine hydrochloride produce a relaxation of the smooth muscle *in vitro* of bronchial-ring preparations from guinea pigs. Its effect is in the order of 1/10,000 that of epinephrine. It is doubtful whether sufficiently high concentrations could be attained *in vivo* in the intact animal with safety to have an effect upon bronchial-muscles.—A. R. MCINTYRE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 133. (H. B. H.)

Hyperthyroidism—Effect of, on Sympathetic Nervous System. The effect of adrenalin on blood pressure is twice as high in normal dogs than in dogs fed thyroid substance. The latter show an increased drop in pressure when the hepatic veins are ligated.—OPAL E. HEPLER and J. P. SIMONDS. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 534. (A. E. M.)

Indol-N-methylharmine—Pharmacological Actions of. The following general summary is given: The minimum lethal dose of indol-N-methylharmine hydrochloride per Kg. by subcutaneous injection is, for the frog 0.11 Gm., for the guinea pig 0.038 Gm. and for the mouse by intraperitoneal injection 0.1 Gm. Toxic doses produce, both in frogs and in mammals a descending paralysis of the central nervous system. With intravenous injections death is primarily due to cardiac failure, respiration continuing for a minute or two after the heart has stopped. Small doses may sometimes produce an insignificant rise of blood-pressure. Large doses cause a fall of blood-pressure, due mainly to slowing and weakening of the heart. Indol-N-methylharmine dilates the coronary vessels in the isolated rabbit's heart. This effect is not so pronounced as in

the case of harmol. Strong solutions cause contractions of frog's skeletal muscle, the muscle soon passing into rigor. The smooth muscle of the intestine is stimulated with low concentrations with increase of tone and inhibited with high concentrations. The uterus is first stimulated with heightened tone and then relaxed. Indol-N-methylharmine kills *Paramœcium caudatum* in a concentration of 1 in 320,000, and *Amœba proteus* in a concentration of 1 in 1,280,000 in 24 hours. As judged by the M. L. D., indol-N-methylharmine is about three times more toxic to laboratory animals than harmine. Both alkaloids have qualitatively similar actions.—ILAHI BAKHSH. *Quart. J. Pharm. Pharmacol.*, 9 (1936), 37–47. (S. W. G.)

Liver Extracts—Therapeutic Potency of, on the Guinea Pig Test of. Previous reports by the author have described in detail the assay of liver extracts for their therapeutic effectivity in pernicious anemia. The evidence for the validity of the test has, until recently, been of an indirect nature. Further studies on the test, confirmatory of the previous results, are presented. There is described also the direct evidence for the validity of the method, namely, the demonstration that all of the substances in liver extract which are active in the guinea pig are hematopoietically active in pernicious anemia. The application of this assay method to commercial liver extracts is discussed.—BERNARD M. JACOBSON. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 129. (H. B. H.)

Mercurochrome and Neoarsphenamine—Influence of Diet on the Toxicity of. The author gives the following summary: (1) The effect of diet has been studied on the resistance of mice to the toxic action of mercurochrome and of neoarsphenamine. The sensitiveness of the mice may be varied by dietary changes. (2) The average lethal dose of mercurochrome for mice fed on bread and milk was 35% higher than for mice fed on oats; the average lethal dose of neoarsphenamine for mice fed on bread and milk was 10% higher than for mice fed on oats. (3) The difference was not entirely due to the milk, for mice fed on bread and lactose solution were equally as resistant to mercurochrome as mice fed on bread and milk. (4) A bread diet gave mice more protection against the toxic action of mercurochrome than a diet of oats, though the difference was less than when milk was given with the bread. (5) Oats and milk gave the same protection as bread alone. (6) In the case of neoarsphenamine, wheat gave the same protection as oats, but neither of these cereals gave as much protection as bread and milk. (7) The liver glycogen was determined for mice fed on bread and milk and for mice fed on oats; and found to be similar for both diets. (8) The significance of the dietary factor in toxicity determinations has been discussed, and the desirability has been suggested, in toxicity determinations of neoarsphenamine, of making simultaneous comparison with the standard.—R. WIEN. *Quart. J. Pharm. Pharmacol.*, 9 (1936), 48–59. (S. W. G.)

Morphine Hyperglycemia—Mechanism of. The work reported here was carried out on both dogs and cats. Morphine sulfate given subcutaneously in doses of 10 mg. per Kg. in dogs and 8 mg. per Kg. in cats caused in every instance a hyperglycemia, the degree and duration of which varied in different animals, the maximum appearing usually within 45 to 105 minutes. If in a previous operation the right adrenal was removed and the left demedullated and denervated by severing the left splanchnics and removing the left lumbar sympathetic chain, morphine caused only a very slight hyperglycemia or none at all. Repetition of the morphine injections even in the same animal (after allowing sufficient time for the recovery of liver glycogen) produced a slight hyperglycemia in one instance and none in another. In a second series of experiments the operation consisted of removal of the right adrenal, denervation and demedullation of the left and severing of the liver nerves. In a third series of experiments the operation consisted of removal of the right adrenal, denervation and demedullation of the left, severing of the liver nerves and the remaining (right) splanchnics and removal of the remaining (right) lumbar sympathetic chain. The effects of morphine in Series II and III were no different from those obtained in Series I. These experiments bring out clearly that the adrenal glands play the predominant rôle in the morphine hyperglycemia in both dogs and cats. The slight hyperglycemia produced by morphine in dogs and cats, in which one adrenal gland has been removed and the other denervated and demedullated, is very similar to that produced in these animals by sympathin brought about by emotional excitement. In view of the possibility of sympathin being a factor in the slight morphine hyperglycemia reported here, work is in progress on totally sympathectomized animals.—R. C. BODO, F. W. COTUI and A. E. BENAGLIA. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 115. (H. B. H.)

Œstrin—Effect of, on Pituitary Gland. The prolonged application of œstrin results functionally in a condition closely resembling that following hypophysectomy. Morphologically it produces a hypoplasia of the anterior lobe of the pituitary, in which, however, the chromophil cells are greatly diminished, so that the enlarged anterior lobe consists mainly of chromophobe cells. There is also an intense congestion which may lead to hemorrhages in the anterior lobe together with an excessive production of colloid which sometimes permeates the anterior lobe. On the assumption that the chromophil cells are responsible for the production of the specific hormones of the anterior lobe, the general condition of hypopituitarism and the extensive changes in other endocrine organs produced by œstrin find their explanation in this disappearance of the chromophil cells of the anterior lobe.—W. CRAMER and E. S. HORING. *Lancet*, 230 (1936), 1056. (W. H. H.)

Paraldehyde and Benzyl Alcohol on Uterine Activity. Paraldehyde first stimulates then depresses the isolated uterus, the stimulant effect being shown best on the horn segment (longitudinal) of the virgin guinea pig (up to 80 mg. in 100 cc. of alkaline Locke-Ringer's), depression appearing in both horn and cervical segments (circular). The isolated uterus of the rabbit usually required doses above 200 mg. to produce depression. Paraldehyde in anæsthetic doses when used (1) alone or (2) in combination with benzyl alcohol (about 10 parts of the former to one of the latter) or (3) by supplementing the anæsthetic dose by as much as 10 cc. of an 8% solution of paraldehyde intravenously, does not suppress the spontaneous uterine movements of the rabbit. Benzyl alcohol produces practically no effect on the isolated uterus (rabbit and guinea pig) in doses up to 10 mg.; 20 to 80 mg. causing depression, the cervical segment usually being depressed before that of the horn segment. Spontaneous movements appeared in the intact anæsthetized rabbit (paraldehyde) after as much as 3 cc. of 3% benzyl alcohol intravenously. Simple summation of effects, resulted from the combined use of paraldehyde and benzyl alcohol in the *in vitro* experiments (rabbits, guinea pigs).—GEORGE B. ROTH and HOWARD F. KANE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 140. (H. B. H.)

Percaine—Pharmacological Investigation of. The minimum concentration of percaine active on the isolated heart of *Rana esculenta* is 1 to 4 or 5 million; if the period of contact is long, the drug is active in even greater dilutions. The drug is fixed on the cardiac muscle and accumulates until an active dose is reached. The action is reversible only after repeated washings with fresh perfusion liquid. The concentration of the drug is not as important as the time it has acted in bringing about reversibility. The minimum active concentration of cocaine is about 40 times and the minimum paralyzing concentration about 25 times greater than those of percaine. Atropine sulphate, atropine and cocaine do not influence noticeably the action of percaine. Adrenaline has a marked effect. When the adrenaline is allowed to act before or simultaneously with percaine, the functional changes caused by percaine appear more slowly and are very weak; when adrenaline acts after percaine, the pulsations become more regular with a simultaneous increase in amplitude and frequency. Fresh perfusion liquid washes away the adrenaline more readily than the percaine. Even in a dilution of 1 to 5,000,000 after 20 minutes of contact percaine has a definite action. On substitution of fresh, pure perfusion liquid, reversibility is very slow. For cocaine, the phenomena are the same but not so intense, and reversibility is more rapid. The minimum active dose is about 1 in 200,000; the minimum paralyzing dose is between 1 in 10,000 and 1 in 40,000. Atropine has no marked influence on the action of either percaine or cocaine, although it does retard the appearance of irregularity in pulsation and incoördination. The antagonism between adrenaline and percaine and adrenaline and cocaine is very evident.—R. SANTI and B. ZWEIFEL. *Atti Soc. Med. Chir. Padova*, 13 (1935), No. 4, 49–53; through *Chimie & Industrie*, 35 (1936), 1138. (A. P.-C.)

Peripheral Circulatory Changes—Continuous Recording of, New Bloodless Method for. A method is described by which changes in the intensity of light transmitted through, or reflected from the skin are graphically recorded. This record, combined with a continuous record of the skin temperature, measured by thermocouple, gives information concerning the state of peripheral circulation. During active vasodilatation the intensity of transmitted light is decreased and the skin temperature rises; during congestion the light intensity is also decreased, but the skin temperature remains unchanged or falls; during vasoconstriction the light intensity is increased and the skin temperature falls. The new method can be used not only for the study of vascular actions of drugs, but may also be applied to other fields of pharmacologic and physio-

logic research; for instance, the evaluation of sensory depressant or stimulating drugs and of local anæsthetics. This application is based on the fact that the vessels of the rabbit's ear respond regularly to certain sensory stimuli with vasoconstriction.—HANS MOLITOR and MICHAEL KNIAZUK. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 6. (H. B. H.)

Pharmacology—Biblical Adventure in. The author has found that the volatile oils are quickly absorbed when applied directly to the skin of the back and abdomen of mice. Physiological and pharmacological symptoms were produced in the animals manifested by a primary excitation, then convulsions and, finally, unconsciousness of a degree entirely dependent on the dosage and kind of oil employed. In most of the small animals death ensued at various periods thereafter. The author intends to make a much more extensive and intensive investigation regarding the possibility of employing some of the volatile oils as vehicles for carrying other medicinal agents through the integument into the deeper lying tissues of the skin and conveying them finally to the lymphatics and blood vessels. The author's interest in the problem was aroused by a passage in the eighteenth verse of Psalm CIX—"So let it come into his bowels like water, and like oil into his bones."—DAVIS I. MACHT. *Am. J. Pharm.*, 108 (1936), 227. (R. R. F.)

Pharmacology for Pharmacists. The eleventh of a series of articles dealing with expectorants especially ammonia, ammonium chloride, creosote, guaiacol, cresol, anise, fennel, eucalyptus, oil of turpentine, ipecac, quillaja, saponaria, senega and glycyrrhiza.—H. FÜHNER. *Apoth. Ztg.*, 51 (1936), 761. (H. M. B.)

Pharmacology for Pharmacists. The fifth chapter of a series of articles dealing with agents for the gastro-intestinal tract including (1) *Emetics* such as ipecac, apomorphine, copper and zinc sulfates (2) *Anthelmintics*, (3) *Spasmolytics* as belladonna and uzura and (4) *Antacids and Antachylics* including sodium bicarbonate, magnesium oxide, hydrochloric acid, betaine hydrochloride, pepsin, pancreatin and yeast.—H. FÜHNER. *Apoth. Ztg.*, 51 (1936), 873–876. (H. M. B.)

Physostigmine and Atropine—Blood Sugar Level Following. A total of 450 observations were made on normal-fed rats. Approximately 50 observations were made for each point on the curve. After the subcutaneous administration of physostigmine in the dosage of 0.25 mg. per Kg., there was a sharp rise in the blood sugar level, the greatest change occurring in one hour. In two hours the curve had returned to the normal level. The same dose of physostigmine was injected into another series of rats 30 minutes after atropine had been administered in the dosage of 20 mg. per Kg. The blood sugar level, followed for $1^1/_2$ hours, showed no change. Atropine, therefore, does prevent the rise in the blood sugar level after physostigmine.—M. CAROLINE HRUBETZ. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 129. (H. B. H.)

Pilocarpine—Influence of, on Glandular Metabolism and Smooth Muscle. In order to elucidate the origin of the salivary lactic acid, it was determined in the saliva obtained by a fistula of the canal of the submaxillary gland and secreted comparatively under stimulation of the tympanic cord and under the influence of pilocarpine on intravenous injection in dogs. The content in lactic acid is always much greater in the saliva collected under the influence of pilocarpine than under the stimulation of the tympanic cord. There is also a sharp parallelism in the variation of lactic acid content in the blood and the saliva. The lactic acid of the blood also passes into the saliva. On account of the surplus salivary lactic acid as a result of the injection of pilocarpine, it is believed that it results in part from the intermediate metabolism of the gland and in part from the intermediate metabolism of the smooth muscle, both being augmented by the parasympathicotonic action exaggerated by pilocarpine.—RADU VLADESCO and GEORGES NICHITA. *Compt. rend.*, 202 (1936), 1533. (G. W. H.)

Posterior Pituitary—Physiological Activity of, of Blue and Sperm Whales. The observations of Geiling on the physiological activity of whale pituitary were extended to cover the blue and sperm whales. The posterior lobe of the pituitary was dried in acetone and powdered. 0.25% acetic acid extracts were made of these powders according to the U. S. P. X method. The pressor and antidiuretic potencies of the extracts were found to be equal to those of beef posterior pituitary powder. The oxytocic activity, however, was different for each species of whale, and in all it was significantly lower than that of beef pituitary powder.

Summary of the relative potencies of the three factors:

	Oxytocic	Pressor	Antidiuretic
Sperm whale	10	100	100
Blue whale	30	100	100
Beef	100	100	100

—WILLIAM T. MCCLOSKY, LLOYD C. MILLER and D. H. LEMESSURIER. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 132. (H. B. H.)

Procaine—Convulsant Action of. Experiments have shown that procaine has a convulsant action at doses very much lower than is generally expected. Whereas the fatal dose is quoted as 400 to 500 mg. per Kg. subcutaneously, the authors found that, on intramuscular administration to rabbits of 80 to 100 mg. of procaine, violent convulsions appear. By the subcutaneous route much higher doses are needed for convulsions. It is difficult to determine the lowest dose which will lead to convulsions. In some animals even 60 mg. per Kg. intramuscularly will produce, within five minutes, violent tonic and clonic convulsions; in others, such a low dose will fail, but 100 mg. are convulsant in practically every animal, the convulsions lasting for about one hour. If 120 to 150 mg. of procaine HCl are given intramuscularly the convulsions usually terminate with death within ten to twenty minutes. Five dozen animals were used to establish these facts. As might be expected, depressant drugs counteract the convulsant action of procaine. It was found that 40 mg. of barbital per Kg. promptly inhibited the convulsions which invariably appear after 120 mg. of procaine without such an addition. If only 20 mg. of barbital are added the duration of the convulsions is reduced to an average of 15 minutes, whereas otherwise they will last for about 45 minutes. If either procaine HCl or procaine base is dissolved in a mixture of half water and half carbitol and that mixed solution is injected intramuscularly, convulsions never appear, not even after 300 mg., manifestly because of the depressant action of carbitol. Another counteracting agent is, of course, epinephrine, added to procaine in the usual concentrations of 1:50,000. The retardation of resorption by local vasoconstriction is strong enough to counteract the effect markedly.—R. BEUTNER, J. J. PRUSMACK and M. L. MILLER. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 114. (H. B. H.)

Salines—Mechanism of Action of, on Intestinal Motility. Unanesthetized dogs, having gastric (Carlson) and intestinal (Thiry) fistulæ, were used. Gastric and intestinal activity were recorded by the balloon and water manometer method or a closed system between the Thiry fistula and the manometer, thus permitting the saline solutions to be kept in contact with the intestine. Solutions (isotonic to five times hypertonic) introduced into the stomach caused no effects on gastric and intestinal activity; isotonic and twice hypertonic solutions, allowed to drain into the Thiry fistula, caused, after a latent period, marked intestinal hypermotility, gastric activity being slightly affected. Intestinal hypermotility as well as secretion was more marked with hypertonic than isotonic solutions of both salts, and with magnesium sulphate than with similar concentrations of sodium sulphate. Intestinal tone was depressed by both concentrations of magnesium sulphate and to a lesser degree by hypertonic sodium sulphate. One milligram per Kg. of atropine, intravenously, almost completely inhibited the early intestinal hyperactivity; later causing only a transitory effect. It is concluded that these salts act through their ions on the receptive mechanism of the parasympathetics to the upper small intestine, the primary stimulus (ion action) probably being accentuated by distention. Later (after one hour) the action undoubtedly shifts to the muscle.—PHOEBE J. CRITTENDEN and GEORGE B. ROTH. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 118. (H. B. H.)

Secretin—Pharmacodynamic Determination of. The principle of the method consists of determining the excitation of pancreatic juice excretion; the Wirsung canal of the animal (dogs) is catheterized under deep anesthesia prolonged for 8 to 10 hours. The animal is anesthetized by intravenous injection of "somnifen" or "numal" (0.3 cc. per kilo), and a first injection of secretin permits of verifying the receptivity of the dog and the permeability of the catheterization system; uniform injections of 0.5 to 1 cc. per kilo are then made at 45-min. intervals, and the volume of juice excreted is measured after 15, 30 and 45 min. In order to give valid results the animal must respond to the successive secretin injections. The variability of secretion is considerable, ranging from 1 to 10. To be comparable, results must be obtained on the same animal; the intravenous method is the only one suitable. As reference standard, a purified extract should be used. The physiological unit of secretin is defined as the excito-secretory power of a dose of 0.4

mg. of duodenal extract administered intravenously without causing hypotension.—H. PENAU and H. SIMONNET. *Congrès de Pharmacie (Liège 1934)*, (1935), 149–159; through *Chimie & Industrie*, 35 (1936), 891. (A. P.-C.)

Sodium Loss—Studies on. Deprivation of sodium produces in dogs symptoms similar to those of adrenal insufficiency.—H. E. HIMWICH, J. F. FAZEKAS and M. A. SPIERS. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 450. (A. E. M.)

Sodium Pentobarbital—Influence of Age and Sex on Repeated Administration of, to Albino Rats. Groups of immature and mature rats were treated intraperitoneally with sodium pentobarbital. Each group was composed of equal numbers of males and females. They were segregated as to age and sex, and were weighed just prior to each injection and dosed proportionately. The dosage was 35 mg. per Kg. of a freshly prepared 2% solution of the drug. The interval between injections was from 42 to 55 hours (usually 48 hours). Prior to treatment the animals were starved for from 6½ to 12 hours (usually 12 hours). Water was always accessible. Observations were made as to the duration of the depression produced. Particular attention was paid to the length of time the animals remained on their sides (*i. e.*, were unable to right themselves and to sit or stand on their feet normally). Those which showed this condition for the greater number of minutes were called less resistant or more responsive. The observations to date may be summarized as follows: 1. Very young females are more resistant (are less affected), than corresponding males; slightly older females approximate males; mature females are definitely less resistant than corresponding males. 2. Animals treated for a period with pentobarbital develop tolerance. But if treatment is intermitted and then resumed (after from 3 to 5 weeks with these animals) there is marked increase in susceptibility (lessening of resistance) initially. If injections are continued, however, this is followed by a speedy restoration of the former tolerance. 3. Contrary to observations of others with amytal, the responsiveness of mature males to pentobarbital is not altered by castration. Hence the sex differences in response to pentobarbital noted in the investigation would seem to depend on some factor other than the gonads.—WILLIAM M. MOIR. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 135. (H. B. H.)

Spinal Anesthesia—Duration of, in the Rabbit. The incidence, ascent and duration of sensory anesthesia produced by the intraspinal injections of 6 to 7 concentrations of 6 local anesthetics, has been determined in the rabbit. The injected volume dose (0.02 cc. per centimeter of spinal length) has been maintained constant throughout. The incidence tended to decrease, whereas, the duration increased with increasing concentrations of each drug. Motor paralysis occurred, as a rule, before the onset, and disappeared after the subsidence, of sensory anesthesia. The durations of sensory anesthesia produced by the M. A. D.'s of the 6 local anesthetics are: procaine hydrochloride, 0.9 %, 16 minutes; tutocaine, 0.5 %, 10.7 minutes; panthesine, 0.5%, 18 minutes; metycaine, 0.86 %, 13 minutes; pantocaine, 0.05 %, 25 minutes; and nupercaine, 0.07 %, 41 minutes.—RAYMOND N. BIETER, J. J. MCNEARNEY, RAYMOND W. CUNNINGHAM and OA LENZ. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 114. (H. B. H.)

Streptococcal and Other Infections—Protection of Mice against, with p-Aminobenzenesulphonamide. *p*-Aminobenzenesulphonamide will protect mice against streptococcal infection. It has the same therapeutic activity as prontosil, but is less toxic when given by mouth, so that it is possible to obtain better protection by giving larger doses. Protection can be obtained against streptococci belonging to different serological types. Some protection of mice against meningococcal infection has been demonstrated but it has not been possible to demonstrate protection against staphylococci or pneumococci. Increase in the number of sulphonamide groups attached to the benzene nucleus to three is accompanied not by increase, but by extinction of streptococcidal activity. The anilide of sulphonilic acid is as active as the amide. Sulphonilic acid itself has a smaller, but not negligible, protective action. Azo-compounds derived from *p*-aminobenzenesulphonamide and phenolic cinchona alkaloids are inferior to prontosil in this respect.—G. A. BUTTLE, W. H. GRAY and D. STEPHENSON. *Lancet*, 230 (1936), 1286. (W. H. H.)

Strophanthin—Observation on the Emetic, Respiratory and Certain Other Actions of, in the Cat. Previous work on the emetic action of strophanthidin showed that the heart cannot be the sole seat of this effect. Present studies indicate that in the cat the liver is not the only abdominal organ in which strophanthidin may possibly act to produce vomiting because practically complete denervation of it does not prevent the emesis. It is noteworthy that doses of 0.20 to 0.35 mg. per Kg. cause vomiting, usually within two to thirty minutes, when given by a

saphenous vein, mesenteric vein, by direct injection into a lobe of the liver, and intraperitoneally, intramuscularly or subcutaneously. Profuse salivation, micturition, defecation and relaxation of the nictitating membrane may also result. Another striking effect often seen is an increase in respiratory rate from normal to 200 or 300 per minute, the tachypnœa lasting in greater or lesser degree as long as an hour in some cats. Vomiting may be the only action noted or it may be accompanied by one or more, or all, of the other phenomena mentioned, when strophanthidin is given by any of the routes above named. In the author's opinion, these facts, taken collectively, point to a central (medullary) action of strophanthidin rather than a peripheral one.—M. DRESBACH. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 120. (H. B. H.)

Strychnine-Barbiturate Reaction. The authors discuss the reciprocal action of strychnine and the barbiturates, these substances, when combined, forming a new complex body with only mildly toxic properties. Three hypotheses have been advanced to explain this action: phylaxis, which is not now considered valid; antagonism; and antidotism. Importance is attached to the precipitate which is formed by mixing solutions of the two substances and which is constant and common to all the barbiturates. This precipitate does not represent strychnine, the barbiturate, or a mixture of the two, but is a complex of the two components in definite proportions molecule for molecule. All these complex bodies are of reduced toxicity. While the lethal dose (for guinea pigs) of strychnine is 3.5 mg., that of the strychnine-soneryl complex is 13.5 mg. and the strychnine-gardenal one 33 mg., acidulated water being the solvent used. If serum is used instead to approximate living conditions, no precipitate is visible. It has been proved that the complex is formed but remains soluble in the blood and that it also possesses hypotoxic properties. The protection afforded by a barbiturate against two lethal doses of strychnine is constant and occurs with very minute doses of the former. Protection can also be obtained against larger doses of strychnine by one or more successive injections of a barbiturate, but the results are uncertain, and much larger doses of the latter must be employed. That some animals survive proves in addition the neutralization effect caused by the complex. Large doses of strychnine are required to protect against the barbiturate, the complex lowering the toxicity of strychnine much more than that of the barbiturate while the quantity of the complex formed itself acts as a poison. This complex is also capable of acting, as strychnine, with the same antagonistic power, but in the protection against the strychnine production of the antidote is the principal effect, while the antagonism is an accessory factor. In the protection against barbiturates the converse occurs. The authors maintain that the mechanism of the reciprocal strychnine-barbiturate protection depends on the formation of the complex.—V. DE LAVERGNE and P. KISSEL. *Presse méd.* (March 11, 1936), 401; through *Brit. Med. J.*, 3932 (1936), 1032B. (W. H. H.)

Sympathomimetic Compounds—Comparative Actions of. Bronchodilator Actions in Bronchial Spasm Induced by Histamine. A group of fifteen sympathomimetic amines, and atropine, were compared as to bronchodilator activity on the bronchospasm of histamine in dogs, using Jackson's method with negative pressure respiration. Epinephrine, epinine and 3,4-dioxyephedrine were found to be excellent bronchodilators; ethylnorsuprarenin and arterenol, good bronchodilators; neosynephrine and cobefrin, fair bronchodilators; *l*-metaoxyephedrine, ephedrine, phenylisopropylamine (benzedrine) and octin, poor bronchodilators. Ephetonal, propadrin, *m*-oxynorephedrine and *p*-oxyephedrine showed little or no bronchodilator activity. Atropine produced a prompt, but moderate, bronchodilation. The results of this report are in essential agreement with those of previous reports describing bronchodilator activity under other conditions. The aliphatic amine, octin, in addition to being a poor bronchodilator, showed no evidences of sympathomimetic activity. The most active bronchodilator amines for histamine-spasm were those containing the catechol nucleus. There was no consistent relationship between the bronchodilator and pressor efficiencies of the compounds studied, and their vasoconstrictor and bronchodilator effects do not necessarily run parallel.—W. M. CAMERON and M. L. TAINTER. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 152. (H. B. H.)

Synthetic Andrines—Biological Activity of some. The various units of bioassay of sex hormones are defined and bioassay methods for androsterone are considered. In particular the various capon units (including the International unit), the rat unit, the mouse unit and the fish unit are reviewed. An histological study is reported of the effect of various gonadotropic agents on the seminal vesicles of male rats (determination of the rat unit by Korenchevsky's method). Literature references are cited.—E. JACOBSEN. *Dansk Tids. Farm.*, 10 (1936), 126. (C. S. L.)

Syntropan—Mode of Action of, in Animal Experiments. The pharmacologic action of syntropan is compared with the action of atropine. It is shown that the actions of syntropan and atropine differ mainly in a quantitative manner. The author points out that a positive or negative decision as to its therapeutic application cannot in any case be arrived at by animal experiments.—K. FROMHERZ. *Quart J. Pharm. Pharmacol.*, 9 (1936), 1–6. (S. W. G.)

U. S. P. Standard Digitalis Powder. The new U. S. P. Standard digitalis No. 915921 was assayed by the one-, four- and twelve-hour lymph sac frog methods and by the Magnus modification of the Hatcher-Brody cat method. The Canadian Standard lot 428 and the British Standard of 1928 were also assayed. The toxicities of the above preparations are all expressed in terms of the International Standard of 1926. It was found that the relative values of the new U. S. P. and British Standards in % of the International increased progressively as the time limit of the frog assay was lengthened. The Canadian Standard behaved in the the above manner only between the one- and four-hour methods, the four- and twelve-hour values being identical. L. D. 50 determinations expressed as mg. per Kg. of frog also brought out the same relationship of relative toxicity to methods. Check assays using tinctures adjusted on four bases substantiated the finding of the primary assays and the L. D. 50 determinations. It is suggested that varied proportions of cardiotonic principles in different preparations might be the basic reason for the above phenomenon. The lethal dose expressed in milligrams per kilogram of cat was found to vary greatly with the anesthetic used. The L. D. of the U. S. P. with ether is 63.35 mg., with urethane 77.9. The L. D. of the International Standard with ether is 90.05, with urethane, 110.35. The potency of the U. S. P. in % of the International is 143.33 using ether and 141.65 using urethane. The cat lethal dose also varies directly as the speed of injection. The L. D. of the International Standard was 110.35 mg. per Kg. with an injection rate of 0.63 cc. per Kg. per minute and 92.2 mg. with a rate of 0.32 cc. per minute The potency of the new U. S. P. Standard No. 915921 is as follows:

Method	Cat	Frog		
		One-Hour	Four-Hour	Twelve-Hour
As per cent of International Standard—1926.....	141.7	134.2	157.7	191.4
As Gm. equivalent to 1.0 Gm. International Standard—1926.....	0.7068	0.7441	0.6341	0.5224

—C. W. EDMUNDS, CARL A. MOYER and JAMES R. SHAW. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 121. (H. B. H.)

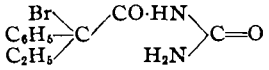
Veratrum Viride—Bioassay of. This drug has fallen into disuse, perhaps because of the lack of a satisfactory assay method. Because of the presence of several alkaloids differing qualitatively and quantitatively in action it appears that a chemical assay would not be satisfactory. Biological assays that have been tried are briefly discussed. The authors found that small definite doses produce emesis upon intravenous injection in pigeons, and a method was developed. Adult pigeons were used. Freshly prepared dilutions of tincture in physiological salt solution were injected into the wing veins, the pigeons placed in individual cages and observed for fifteen minutes. Emesis usually occurred in from two to five minutes, was short and showed definite characteristics. "The minimum emetic dose was considered as the smallest dose, expressed in cc. of the tincture per Kg. body weight, which would produce emesis within fifteen minutes in approximately 75% of the pigeons injected." Results of experimental work are tabulated and discussed. No attempt was made to determine seat of emetic action but the following data indicate that it is central: "(1) Intravenous injections of the drug produce emesis usually in from two to five minutes. (2) About twenty minutes is required for an emetic action to take place when the drug is administered intraperitoneally. (3) The intravenous emetic dose is much smaller than that dose required to produce emesis when injected intraperitoneally. (4) The consistency obtained would hardly have been possible had the emetic action been due to local irritation." The method has the following attributes of a good method: a definite and easily recognized end-point, economy (the pigeons may be repeatedly used), little time required, accuracy within 10% and simplicity.—B. V. CHRISTENSEN and A. P. MCLEAN. *J. Am. Pharm. Assoc.*, 25 (1936), 414. (Z. M. C.)

TOXICOLOGY

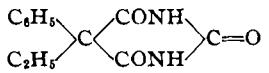
Acetanilid—Effects of, on the Growth and Blood Morphology of Rats. In rats acetanilid in doses of 19 and 38 mg. per Kg. of body weight orally (minimum therapeutic antipyretic dose = 12.5 mg. per Kg. (11)) six times a week for 13 weeks did not produce significant changes in the growth, food consumption, hemoglobin concentration, number of erythrocytes, leucocytes or ratio of types of leucocytes. Rats receiving doses of 200 mg. of acetanilid per Kg. (50 per cent "fatal" single dose = 800 mg. per Kg. (11)) six times a week for 10 weeks were likewise not found to be significantly different from normal animals. Twenty-six rats were given 400 mg. of acetanilid per Kg., some of them being continued for as much as 13 weeks. During this time 9 of them died. The average duration of life at this dosage was not determined, but was at least 70 days. The animals grew more slowly than normal animals and at 6, 10 and 13 weeks the hemoglobin concentration and number of erythrocytes were significantly lower. No changes were observed in the leucocytes. At the end of ten weeks the number of reticulocytes was several times that of normal animals (S. R. = 8.6). Nine rats that received 400 mg. per Kg. for 13 weeks were studied for 4 weeks after withdrawal of the drug. At the end of this time they were growing at more than the normal rate and the hemoglobin, erythrocytes and reticulocytes were at approximately normal level. The fall in temperature in these withdrawn animals after a subsequent large single dose of acetanilid was not significantly different from that in normal animals. These results show that more than one-fourth of the acute fatal dose of acetanilid must be given daily in order to produce signs of chronic toxicity. Such doses are many times larger than the dose necessary to produce therapeutic effects in these animals.—PAUL K. SMITH and W. E. HAMBOURGER. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 34. (H. B. H.)

Acetanilid—Growth and Blood Morphology of Rats Receiving Sodium Bromide, Caffeine and Combinations with. Sodium bromide, given in one-half the acute fatal dose (1750 mg. per Kg.) per day to rats, was rapidly fatal, the average survival being 7 days. Addition of one-half the acute fatal dose of acetanilid (400 mg. per Kg.) had no appreciable effect on the toxicity. Addition of caffeine as well as acetanilid was also without significant effect. Caffeine in one-half the acute fatal dose per day (100 mg. per Kg.) to rats for 13 weeks caused a retardation, but not a cessation of growth. Some of the animals (3 out of 10) died during the experiment. The blood showed no significant changes except a rise in the % of reticulocytes. Withdrawal of the drug resulted in growth at more than the normal rate, and the % of reticulocytes returned to a normal level. Acetanilid plus caffeine given in one-half the acute fatal dose of each per day to rats for 13 weeks was somewhat more toxic than either drug alone. Four out of 10 of the animals died before the end of the experiment. The growth was slower than with either drug, while the hemoglobin and erythrocytes were at approximately the same level as in rats receiving acetanilid alone. These studies do not show that either acetanilid and sodium bromide, or acetanilid and caffeine are mutually protective in their toxic effects by oral administration.—PAUL K. SMITH and W. E. HAMBOURGER. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 43. (H. B. H.)

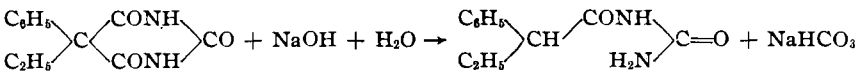
Adalin—Allergy with Reference to. Cases have been reported where a condition of cutaneous disease has followed the use of adalin, which other authors have likened to purpurea annularis. The symptoms of the skin affection disappear when the use of adalin is discontinued. Contrary to the opinion of Loeb, that only urea derivatives with closed chains cause skin affections, K. Edel (*Tijdschrift, v. Geneesk.* (1936), 237) is of the opinion that the skin affection is caused by the urea derivatives with open chains. The formula for adalin is,



Luminal has the formula:



It is possible that under the influence of the alkaline body juices the phenylethylacetylurea is broken into a urea derivative with an open chain (C. J. BLOK, *Pharm. Weekblad* (1935), 1221) as illustrated in the following equation:



—*Pharm. Weekblad*, 73 (1936), 364. (E. H. W.)

Amidopyrine and Agranulocytosis. The authors have noted that between May 1933, and July 1934, as many as forty-one cases of amidopyrine agranulocytosis have been recorded in Denmark and that thirty-seven of them terminated fatally. With such a high death rate, the opportunity for investigating the subsequent reaction to amidopyrine of patients who have recovered from an attack of agranulocytosis have been scanty. The authors have studied this in the case of a woman, aged 35, suffering from chronic rheumatic polyarthritis, for which she was hospitalized on three different occasions, the first in 1932. Courses of treatment with amidopyrine were followed by signs of agranulocytosis, including pain in the throat, cough and fever on two if not three occasions, and on one of them it was the perusal of an article in the daily press which led the patient herself to discontinue taking amidopyrine. She had taken about 380 Gms. in the course of fourteen months before her sensitiveness to amidopyrine became apparent. When she was admitted for the third time to the hospital in 1935 her acquired sensitiveness to amidopyrine was investigated, leucocyte counts being undertaken before and after administration of 0.2 Gm. of amidopyrine. Altogether forty-nine counts and differential counts were recorded. It was found that in the course of the first hour or two after the administration of the amidopyrine there was an initial fall from 10,000 to 7,100. There followed a brief rise succeeded by a prolonged fall to 1,900 granulocytes. Thereafter there was a slow rise, but it was not until four days after the administration of amidopyrine, that the granulocyte count returned to normal. As the author's chart shows, the granulocyte depression was more prolonged than that of the leucocytes as a whole. The main conclusion is that the patient who has recovered from amidopyrine agranulocytosis is remarkably sensitive to even quite small doses of this drug.—A. B. HANSEN and C. HOLTEN. *Ugeskrift for laeger* (March 5, 1936), 193; through *Brit. Med. J.*, 3938 (1936), 1332A. (W. H. H)

Aniline Dye Workers—Hygiene of. The author deals with the toxic action of aniline, the mild and severe forms of intoxication, lesions produced and the methods of prophylaxis and the treatment to be employed. The paths of absorption are principally the skin, less frequently the respiratory tract and only in exceptional cases the alimentary canal. The intoxication may be acute, being manifested by cyanosis, headache, jaundice, vertigo, or chronic with symptoms of anemia and digestive disturbance. The remote sequels of prolonged contact with aniline consist in recurrent simple hemorrhagic cystitis and benign-papillomatosis or carcinoma of the bladder. To prevent professional intoxication by aniline and its derivatives the following are necessary: the use of hermatically sealed apparatus; large and well-ventilated workshops with an impermeable floor; and individual hygiene consisting of inspection of the workers and the dangers to which they are exposed; avoidance of alcohol which favors the toxic action of aniline, baths at regular intervals, immediate change of clothing contaminated by aniline and regular medical inspection.—S. HERSCOVICI. *Thesé de Paris* (1936), No. 37; through *Brit. Med. J.*, 3942 (1936), 210A. (W. H. H.)

Barbiturate-Picrotoxin Antagonism—Analysis of. The survival of animals poisoned by massive intravenous doses of sodium barbital (1,000 to 1,650 mg. per Kg.) and of sodium pentobarbital (100 to 160 mg. per Kg.) was studied with relation to picrotoxin and metrazol used as antidotes. Both drugs were found to be effective in saving the life of acutely poisoned dogs and rabbits. These analeptics were administered over a period of 24 to 48 hours in doses, totaling in some cases 100 mg. of picrotoxin per Kg. and 900 mg. of metrazol per Kg. In the depressed animals, doses of picrotoxin sufficient to antagonize the barbiturate are more likely to produce hyperexcitability and convulsions than similarly effective doses of metrazol. Picrotoxin and metrazol are about equally effective as respiratory stimulants, but picrotoxin is more effective as a circulatory stimulant. Besides the medullary actions, which are largely responsible for the life prolonging or life saving action, these drugs have a denarcotizing effect which is best elicited in animals anesthetized with minimum anesthetic doses of barbiturates. These animals are awakened and restored to normal behavior after a short-acting barbiturate narcosis by these antidotes, whereas animals awakened from long-acting anesthesia may relapse into depression. This denarcotizing effect of picrotoxin and metrazol as studied in rabbits and human subjects poisoned

with barbiturates is due, at least in part, to cortical stimulation. In several dogs, sodium pentobarbital abolished the excitability of the motor cortex which could be promptly restored by appropriate doses of picrotoxin. The effect of picrotoxin on the fate of barbiturates in the body was studied in rabbits and dogs. The evidence shows that picrotoxin awakened the animals and that the animals remained in a wakeful state without an increased destruction of barbiturates. In most cases, the concentration of barbiturates in the awakened animals was the same as in the depressed animals. In some instances, the awakened animals had lower concentrations of barbiturates than the depressed controls. The conclusion drawn from these experiments is that picrotoxin does not augment the destruction of barbiturates, but that in some cases the awakened animals, due to their better physiological conditions, are able to destroy larger amounts of hypnotics.—THEODORE KOPPANYI, CHARLES R. LINEGAR and JAMES M. DILLE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 130. (H. B. H.)

Barbiturate Structure—Delayed Death in Relation to. Following the administration of suitable doses of isopropyl-beta-brom-allyl barbituric acid (nostal) to rats, the animals apparently recovered from acute depression within a few hours; but most of them died later, usually on the second or third day, from pulmonary edema, generally accompanied by pneumonia and fatty degenerative changes in the liver, kidneys, heart and lungs. Such delayed death occurred occasionally even from subhypnotic doses of nostal. The delayed deaths were not due to any unusual sensitivity to bromides, nor to the acidity of the hydrobromic acid liberated, because sodium allurate (isopropyl-allyl barbiturate) with sodium bromide or with hydrobromic acid did not cause delayed death. Adding one CH_2 group to the isopropyl group of nostal (giving pernoston) decreased the tendency to delayed death, and adding one further CH_2 group (rectidon) abolished it. Methylation of one nitrogen in nostal also gives a compound (eunarcon) which only rarely causes delayed death. The chlorine homologue of nostal and dichlor-allyl barbiturate also cause delayed death, although less readily; but no such death was seen after the administration of the chlorine homologue of pernoston. Delayed death did not follow the administration of the closely related isopropyl-allyl barbiturate (allurate), nor the isopropyl-ethyl barbiturate (ipral); nor could it be demonstrated after administering one of the supposed early decomposition products of nostal, namely isopropyl-acetonyl barbiturate. Nine other barbiturates also were ineffective in causing delayed death in the rat (amytal, barbital, evipal, neonal, ortal, pentobarbital, phanodron, phenobarbital and sandoptal). Other experiments indicated that rabbits are much less prone to this kind of delayed death, and that it does not occur in mice after administration of nostal.—HAROLD G. O. HOLCK and PAUL R. CANNON. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 128. (H. B. H.)

Cocaine—Renal Secretion of, in a Case of Acute Poisoning. In a case of acute poisoning with 800 mg. of cocaine accidently injected into the tonsillar area, the woman survived approximately 12 hours after the intravenous administration of sodium amytal, sodium chloride solution and glucose. During this period 12 hourly samples of urine were collected and at autopsy specimens of liver, heart, kidney, brain, blood and the residual urine were obtained for analysis. The amounts of cocaine recovered in the first 7 samples of urine were, respectively, 196, 69, 71, 50, 17, 11, 14 mg. The total amount of 429 mg. or about half the quantity injected. None was recovered from the other 5 samples of urine and the other materials. The cocaine was estimated by the periodide titrimetric method of Gordin and also by biological tests upon frogs and mice and humans. The total volume of urine excreted was 1292 cc. the later samples contained increasingly large quantities of albumin and blood. It is concluded that after large doses of cocaine in the human much of the drug is excreted by the kidney.—A. R. MCINTYRE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 133. (H. B. H.)

Dendrobine—Detoxification of, by Sodium Amytal. The alkaloid from the Chinese drug Chin-shih-hu produces convulsions of central origin. Sodium amytal detoxifies five minimal lethal doses.—K. K. CHEN and CHARLES L. ROSE. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 553. (A. E. M.)

Derris Species—Toxic Value of. Aqueous extracts (I) of *Derris elliptica* Prain, of high and low rotenone content (II) and of *D. malaccensis* var. Sarawakensis, Hend., of low (II) rotenone content give erratic, but approximately equal control of *Spodoptera pecten* and *Aspidomorpha miliaris*. (II) is thus no index of toxicity. Control by dusts prepared by adding calcium hydroxide or barium hydroxide to (I) and by rotenone, toxicarol, deguelin, and the total non-crystal-

line ingredients in dimethyl ketone (with tannic acid) or sulfonated castor oil is also erratic. Derris appears not to be a stomach poison, much rotenone being excreted unchanged and some in some form of combination by *Periplaneta americana*, but is a deterrent, since food sprayed with (I) is usually not eaten. It may contain a volatile poison, since a steam-distillate of the root and air bubbled through (I) are slightly toxic and insects confined above the fresh root show a high mortality.—N. C. E. MILLER. *Dept. Agric. Straits Settlements and Fed. Malay States, Sci. Ser.*, Bull. 16 (1935); through *J. Soc. Chem. Ind.*, 54 (1935), B., 576. (E. G. V.)

Dinitrophenol—Toxicity of. The substance is considered to be safe if used only in suitable cases and under medical vigilance.—PH. DALLY. *Semana méd. (Buenos Aires)*, 43, 1 (1936), 1648. (A. E. M.)

Fluorine—Limitation of, Toxicosis in the Rat with Aluminum Chloride. The destructive action of sodium fluoride on the teeth of rats when fed with the diet, was prevented when aluminum chloride was fed simultaneously.—GEORGE SHARPLESS. *Proc. Soc. Exptl. Biol. and Med.*, 34 (1936), 562. (A. E. M.)

Gold Treatment—Accidents in Rheumatoid Arthritis with. It has been seen that accidents associated with treatment by gold salts are protean in their character and are by no means rare. If reasonable care is taken in the supervision of the treatment, if careful inquiry is made into the subjective phenomena experienced by the patients themselves, and if the urine and blood are regularly examined no very serious complications are likely to arise. Possible exceptions to this rule are the skin rashes which may occur suddenly, unexpectedly, and even, some weeks after administration has been discontinued. It has been said that eosinophilia is a warning, but there is some doubt about this. In only two cases in this series were polymorphonuclear eosinophils much preponderant. One of these cases at no time showed any sign of either biotropic or toxic reaction, the other case has been described as suffering from an erythema of an eczematous type. It is hoped that some means may be found to reduce the toxicity of the salts either by a change in their chemical composition or by the concurrent administration of some adjuvant. It seems that chrysotherapy should only be undertaken when the case is severe enough to warrant such a very real risk, which should be explained to the patient before treatment is instituted.—G. J. V. CROSBY. *Lancet*, 230 (1936), 1463. (W. H. H.)

Nembutal—Toxicity and Tolerance of, in Guinea Pigs. The purpose of this investigation was to determine the average lethal dose (A. L. D.) of nembutal for guinea pigs and to see whether a tolerance could be produced to the drug in guinea pigs if a fraction of the A. L. D. were injected daily or semi-weekly. The A. L. D. was determined by injecting an aqueous solution of the drug intraperitoneally into 510 normal guinea pigs. The weights of the guinea pigs varied from 200 to 799 Gm. and the dose per Kg. body weight varied by 2.5 mg. increments from 42.5 to 67.5 mg. The A. L. D. decreased as the weight increased: (1) 57.5 to 60 mg. for 200- to 399-Gm. pigs, (2) 52.5 to 55 mg. for 400- to 599-Gm. pigs and (3) 45 to 47.5 mg. for 600- to 799-Gm. pigs. The weights of the pigs greatly influenced the duration of sleep for those animals that recovered; less of the drug per Kg. being required in the case of the heavier pigs than with the smaller pigs for the production of the same length of sleep. To study the tolerance of guinea pigs for nembutal, the periods of time required for the development of three stages in the hypnotic state were selected; (1) the time from the injection until the animal could not move forward after painful stimulation (pinching), (2) the time from the injection until the animal could move forward after painful stimulation, and (3) the time from the injection until the animal could walk with a steady gait for about a meter. The weight of the pig greatly influenced the length of the hypnotic state, the heavier pig having the longer period of hypnosis, when the same size dose per Kg. was given. Guinea pigs develop a tolerance to nembutal since its effectiveness as a hypnotic decreased following repeated administration. A total of 119 normal pigs was used on the tolerance experiments.—EMMETT B. CARMICHAEL and LOUIS C. POSEY. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 116. (H. B. H.)

Nicotine Intoxication in Sucklings. The author, who reports the first case of this kind, states that Hatscher and Crosby in 1928 showed that when a cat was injected with nicotine during lactation the nicotine was extracted in the milk; there was also considerable diminution of the milk secretion. Fish found a similar occurrence in cows. Hoag in 1928, Thompson in 1933, and several other American observers found nicotine in the milk of mothers who smoked cigarettes, but nothing wrong with the infants. Emmanuel in 1932 reported that a mother's smoking of six

to seven cigarettes daily had no effect on the child, but after fifteen cigarettes toxic symptoms were observed. Sokolov in 1928 noted that nicotine caused acute and chronic insufficiency of the mammary gland, and Mgalobele, 1931, also found that women in tobacco factories suffered severe systemic damage as the result of the nicotine intoxication, which had an injurious effect on their offspring. In Greiner's case an infant aged 11 days, whose mother was smoking from thirty-five to forty cigarettes a day, showed signs of intoxication in the form of restlessness, vomiting, diarrhœa, followed by constipation and sunken fontanelle. The mother was ordered to stop smoking, and rapid recovery ensued.—I. GREINER. *Jahrb. f. Kinderheilk.* (1936), 131; through *Brit. J.*, 3933 (1936), 1090A. (W. H. H.)

Nicotine Poisoning. The authors examined forty-one male and fourteen female factory hands engaged in the extraction of nicotine from tobacco leaves and in the preparation of nicotine sulphate and found that the pathological manifestations of short repeated small doses of nicotine were mainly due to disorders of the autonomic nervous sytem. Many of the symptoms were traceable to stimulation of the vagus, to these belong the slow and often irregular pulse, gastric hyperacidity, spasms of the non-striated muscles, salivation and sweating. Other symptoms, such as vascular spasms of the limbs and tremors, were caused by stimulation of the sympathetic system. Some of the central nervous symptoms could be explained by disorders of the autonomic nervous system, which gave rise to disturbances of the cerebral circulation. Other cerebral symptoms were caused by direct action of nicotine on the central nervous system, which resulted in disturbed sleep, weakening of the memory and neurotic symptoms. The authors add that the treatment varies according to the type of poisoning. In acute cases in the presence of symptoms of depression of the central nervous system stimulating remedies are indicated, such as strong coffee, strong tea, caffeine, camphor, and, if necessary, artificial respiration. Atropine is useful in cases of over excitement. In subacute cases the treatment is symptomatic.—S. GUENKIN, D. PISSARECFF, B. SEREBRYANIK and S. BROWN. *Clinitcheskaya Meditsina*, 14 (1936), 21; through *Brit. Med. J.*, 3936 (1936), 1238A. (W. H. H.)

Ortal Sodium—Toxic and Anesthetic Properties of, in Experimental Animals. Ortal sodium in a 2% solution was administered intraperitoneally in 107 rats. In these the minimal anæsthetic dose was found to be 100 mg. per Kg. body weight. The average duration of anæsthesia for 100, 150, 200, 225 and 250 mg. per Kg. was 28, 59, 96, 121 and 148 minutes, respectively. The mortality for the same doses was found to be 0, 3, 22, 38 and 59%. In rats the factor of safety was found to be 2.4. Rats weighing less than 100 Gm. and more than 175 Gm. had the highest mortality per cent. In mice the intraperitoneal injection of 150 mg. per Kg. caused anæsthesia lasting, on the average, 92 minutes. Ortal sodium was administered intravenously in dogs in doses of 25, 40, 50 and 75 mg. per Kg. body weight at the rate of 100 mg. in each cc. per minute. Only 36% of the animals which received 25 mg. per Kg. showed anæsthesia and this was of only 7.4 minutes' average duration. In the other doses ortal sodium produced anæsthesia of 72, 82 and 112 minutes' duration with a death rate of 5, 25 and 33%, respectively. The factor of safety was found for dogs to be approximately 2.0. Upon oral administration dogs tolerated as much as 150 mg. per Kg. with a much longer period of anæsthesia. Nephrectomy had no effect upon the duration of anesthesia produced by the intravenous administration of ortal sodium. In the same animals, using the same amount of the drug, sodium amytal was found to produce anæsthesia lasting over three times as long as that caused by ortal sodium. When 100 mg. of ortal sodium per Kg. was given to cats they showed anæsthesia of one-hour duration. When the amount was increased to 150 mg. per Kg. the animals remained anæsthetized for over two hours and definitely narcotized for over 24 hours. In some cases the animals were unable to stand 48 hours after the administration of the drug although eventually they recovered. Ortal sodium administered intravenously in cats in doses of 50 mg. per Kg. at the rate of 50 mg. per cc. per minute produced anæsthesia lasting about 59 minutes. The effect of this drug was also studied in rabbits. The anæsthetic and toxic doses were found to be very close to each other upon the intravenous administration of the drug. Because of this the intravenous administration of this drug is not recommended in these animals.—CHARLES M. GRUBER and JOHN T. BRUNDAGE. *J. Pharmacol. and Exper. Therap.*, 57 (1936), 124. (H. B. H.)