

PHARMACEUTICAL ABSTRACTS

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BOTANY

German Oak Bark. A discussion.—WALTER MEYER. *Wien. Pharm. Wochschr.*, 72 (1939), 421-424. (H. M. B.)

Hemicelluloses—Origin and Composition of the, Obtained from Hardwoods. Hemicelluloses have been prepared from white birch wood, lemon wood and the sapwood and the heartwood of black locust before and after chlorination of the wood. Lemon wood and the sapwood of black locust contained starch. The other two woods were starch-free. All of the hemicelluloses obtained from lemon wood and the sapwood of the black locust before chlorination gave a blue or pink coloration with iodine solution. Analyses of these hemicelluloses show that those which are not colored by iodine solution consist of a monomethylated uronic acid combined with a series of *d*-xylan groups. The largest of these hemicelluloses contains approximately nineteen xylan groups in the molecule while the smallest contains as few as eight xylan groups. It appears that a mixture of hemicellulose molecules varying in size from approximately ten to nineteen xylan groups exists in the wood. During the process of isolation and purification some of these are hydrolyzed to still smaller molecules. The hemicelluloses which are colored blue or pink by the iodine solution apparently contain anhydroglucose groups in the xylan chain. They seem to be intermediate products in the transformation of starch or dextrin to hemicelluloses. When all the facts are considered, it appears that the same hemicelluloses are present in all the woods which do not contain starch and that these are formed from starch or dextrin.—ERNEST ANDERSON, MILLARD SBELEY, WILLIAM T. STEWART, JOHN C. REDD and DON WESTERBEKE. *J. Biol. Chem.*, 135 (1940), 189. (F. J. S.)

Minor Elements in Plant Growth. A review with 88 references.—S. LEWONIEWSKS. *Uprawa Roslin i Nawozenie*, 8 (1938), 87-99; through *Chem. Abstr.*, 33 (1939), 5968. (F. J. S.)

Plant Smears—New Fixative for. A 2.5% solution of Na U acetate is recommended as a fixative for pollen mother cell smears. The cells are fixed for about 2 hours, washed for about 1 hour and hardened in alcohol before staining. With some plants the fixative can be improved by the addition of formalin or 0.5% chromic acid. A certain amount of U is preferentially absorbed by the chromosomes and this feature may be of use in studies of the nature of fixation. The fixative coagulates the cytoplasm differentially from the nucleus.—B. N. SINGH, S. SAMPATH and R. K. BANSAL. *J. Indian Botan. Soc.*, 18 (1939), 107; through *Chem. Abstr.*, 34 (1940), 3785. (F. J. S.)

Poisonous Plants of Salzburg—Herbarium of the. A classification and description of these toxic plants.—WALTER ZIMMERMANN. *Wien. Pharm. Wochschr.*, 72 (1939), 348-350. (H. M. B.)

Salzburger Herbarium of Hieronymus Harder of 1592. A description and listing of plants are recorded.—WALTER ZIMMERMANN. *Scientia Pharm.*, 11 (1940), 21-24, 27-31. (H. M. B.)

Seaweeds. II. Mucilaginous Substance in Seaweeds. Eight varieties of seaweed were studied. The mucilaginous substance was extracted with boiling water, concentrated under a reduced pressure and precipitated with alcohol. Its chemical and physical properties were determined.—TETUNOSUKE YANAGIGAWA and TOSITAKA YOSIDA. *Repts. Imp. Ind. Research Inst., Osaka, Japan*, 20 (1939), No. 5, 15 pp.; through *Chem. Abstr.*, 34 (1940), 4418. (F. J. S.)

Spinach—Vitamin C in. Spinach (*Spinacia oleracea*) of five different stages of ripeness was

examined for vitamin C content. The vitamin content in the leaves reaches its maximum during the middle stages of development and decreases with further development of the plant. Similar changes occur in the rootlet of the spinach. The higher the weight per unit section of the leaves the greater the vitamin content. The vitamin content decreases downward along the plant.—D. A. SLEPYKH. *Konservnaya i Plodoovoshchnaya Prom.*, (1939), No. 1, 22; through *Chem. Abstr.*, 34 (1940), 4111. (F. J. S.)

Vitamin C Content of Flower Nectar of Definite Labiates. Nickel wire screens were placed at the top of the cone in centrifuging tubes and the tubes were filled with flower corollas. Separation of nectar was by centrifuging at 2500 r. p. m. for 10 minutes. Results from *Thymus serpyllum*, *Mentha arvensis* and *Lycopus europaeus* flowers, respectively, were ascorbic acid 222, 288 and 222 mg. % and total solids 20, 58.5 and 37%. Calculated to honey with 80% total solids the ascorbic acid contents are 888, 394 and 600 mg. %, respectively. A comparison of this with data obtained on honey suggests that there is considerable loss of vitamin C when the bee converts nectar into honey. Only 6 mg. % ascorbic acid was found in flower tissue.—C. GRIEBEL and G. HESS. *Z. Untersuch. Lebensm.*, 79 (1940), 168; through *Chem. Abstr.*, 34 (1940), 4418. (F. J. S.)

Wound Hormones of Plants. IV. Structure and Synthesis of Traumatin. The crystalline substance isolated from string bean pods and capable of inducing renewed cell division and cell extension activity in the parenchymatous cells of the bean pod mesocarp is shown to be 1-decene-1,10-dicarboxylic acid. Synthetic 1-decene-1,10-dicarboxylic acid was prepared and shown to be identical with the natural product both in physical properties and in physiological activity. It is proposed that the name "traumatic acid" be used in referring to this substance. Traumatic acid is also shown to be capable of inducing wound periderm formation in washed disks of potato tuber and to function thus as a wound hormone of the potato. Traumatic acid is also capable of partially replacing the juice of the tomato fruit in reversibly inhibiting the germination of tomato seeds.—J. ENGLISH, JR., J. BONNER and A. J. HAAGEN-SMIT. *J. Am. Chem. Soc.*, 61 (1939), 3434. (E. B. S.)

CHEMISTRY

GENERAL AND PHYSICAL

Agar and Saponin Mixtures—Viscosity of. The effect of p_H on viscosity was studied in mixtures of negatively charged agar sol and saponin sol, p_H 3.3, 5.0, 7.5, 8.5 (at 20°), concentrated 1% saponin and 0.1% agar. The viscosities were determined by the Ostwald instrument at 40°, after 4 hours in the thermostat. Tabulated values are given for the entire range of mixtures for $(\eta - \eta_0)/\eta_0$ found and calculated. There is a pronounced lowering of additivity especially at p_H 3.3 and 5.0 (minimum at 71% and 73%, respectively). In no case was turbidity or coacervation observed, even after 12 hours and after adding 5% ethyl alcohol.—R. RUYSSSEN and J. ROWAN. *Natuurw. Tijdschr.*, 21 (1939), 76-78; through *Chem. Abstr.*, 33 (1939), 5724. (F. J. S.)

Amino Acids and Related Substances—Thermodynamic Properties of Solutions of. VI. The Activities of Some Peptides in Aqueous Solution at 25°. Isopiestic vapor pressure measurements have been made at 25° of aqueous solutions of glycylglycine, triglycine, alanylglycine, glycyllalanine and alanylalanine. The osmotic and activity coefficients of these peptides have been calculated. Certain relations between the activity coefficients and the dielectric constants of their solutions have been

discussed.—ELIZABETH R. B. SMITH and PAUL K. SMITH. *J. Biol. Chem.*, 135 (1940), 273. (F. J. S.)

Calcium and Magnesium Phosphates—Dissociation of. Phosphoric acid was titrated electrometrically in the presence of KCl, NaCl, MgCl₂ and CaCl₂. No differences were observed up to the addition of one equivalent of NaOH. Thereafter, the mixtures containing MgCl₂ or CaCl₂ were more acid than the corresponding mixtures containing NaCl or KCl. The results can be formulated as being due to the formation of slightly dissociated MgHPO₄ and CaHPO₄. The value for the negative logarithm of the dissociation constant of MgHPO₄ is approximately $2.50 - 2.15 \sqrt{\mu}$. CaHPO₄ shows a slightly greater tendency to dissociate.—ISIDOR GREENWALD, JULES REDISH and ANDRE C. KIBRICK. *J. Biol. Chem.*, 135 (1940), 65. (F. J. S.)

Carbon—Adsorption of Various Classes of Organic Compounds by, in Aqueous Solution. The result obtained by Chakravarti and Dhar is thrown into the form $s = kx^m(1 + nx^m)$, where s and x are, respectively, the concentrations of the adsorbed substance on the adsorbent and in the solution, the number of surface molecules per unit of mass of the adsorbent, m an exponent equal to or less than 1, k a constant defined as the coefficient of affinity of the adsorbed substance for the adsorbent, and n a parameter representing the number of active molecules of adsorbent neutralized by each adsorbed molecule. This is applied to (I) primary fatty alcohols and monobasic acids; (II) polyalcohols including sugars and polyacids; and (III) mono- and polyphenols. The results are discussed, the chief conclusion being that n increases with complexity of the adsorbed molecule; as also does k in groups I and II; in III it remains approximately constant.—R. AMIOT. *Compt. rend.*, 208 (1939), 1575–1577; through *Chem. Abstr.*, 33 (1939), 5261. (F. J. S.)

Cellophane Membranes of Graded Permeability—Preparation of. A method is described for the preparation of cellophane membranes of predictable pore size. It was found that the difference in pore size of membranes which allowed no passage of egg albumin and those which allowed complete filtration was very small. The same statement applies to hemoglobin solutions. On the other hand, the range of pore sizes required for the filtration of the proteins of human serum was quite large, the data supporting the conception that human serum protein is a heterodisperse system. Changes in p_H and in salt concentration were found to affect the filtrability of sodium arabinatate markedly. Cellophane membranes of graded porosity can easily and quickly be prepared by the use of zinc chloride solutions. These membranes, which are isoporous and reproducible, are suitable for ultrafiltration and fractional ultrafiltration of solutions of small colloidal molecules.—W. B. SEYMOUR. *J. Biol. Chem.*, 134 (1940), 701. (F. J. S.)

Chlorine and Nitric Oxide—Kinetics of the Inhibition of Reaction between. The reaction between chlorine and nitric oxide has always been considered as a termolecular homogeneous reaction. The present work shows that the reaction velocity can be considerably influenced by surface conditions, and therefore this reaction is really heterogeneous in character. The nitrosyl chloride formed can, by adsorption on the surfaces of the reaction vessel, inhibit the reaction to such an extent that it ceases altogether, a phenomenon reminiscent of the effect of drying on chemical reactions. The evidence indicates that association of nitric oxide occurs heterogeneously, the complex being capable or incapable of homogeneous reaction with chlorine depending upon whether the complex molecule has been stabilized or not by the surface of the reaction

vessel.—ERIC M. STODDART. *J. Chem. Soc.*, (1940), 823–831. (W. T. S.)

Ferric Phosphate Sol—Stabilizing, by Blood Serum. Some serum is added to a disodium phosphate solution and to a ferrous sulfate solution, and the solutions are mixed together; the rate of turbidity increase is measured. It is lowered by cow serum more than by that of bull. Serum albumin produced by dialysis does not show a difference between the sexes.—M. KOLOMITSEVA. *Kolloidny J.*, 4 (1938), 201–204; through *Chimie & Industrie*, 42 (1939), 852. (A. P.-C.)

Fluorides—Adsorption of, by Enamel, Dentin, Bone and Hydroxyapatite as Shown by the Radioactive Isotope. Enamel, bone, dentin and hydroxyapatite are shown to adsorb fluorine according to the Freundlich adsorption isotherm. The coefficients characteristic of the adsorbed substance (n) and of the adsorbent (k) have been calculated for each substance.—JOSEPH F. VOLKER, HAROLD CARPENTER HODGE, HELEN J. WILSON and STANLEY N. VAN VOORHIS. *J. Biol. Chem.*, 134 (1940), 543. (F. J. S.)

INORGANIC

Aluminum Bromide—Preparation of Anhydrous. A simple and convenient method for preparing anhydrous aluminum bromide is reported. The important features of this method are: the introduction of the bromine near the bottom of the reaction vessel (through a tube which is not vertical, since a wide channel is quickly eaten out adjacent to a vertical tube) so that it may be distilled upward through the mass of aluminum and react in the vapor phase; the control of the temperature within the flask by the refluxing of the molten aluminum bromide over the metal; and the purification of the product as fast as it is formed.—P. K. WINTER and P. L. CRAMER. *Ind. Eng. Chem.*, 32 (1940), 856. (E. G. V.)

Boron Fluoride—Sulfonation and Nitration Reaction Promoted by. Boron fluoride is shown to be a remarkably effective promoter and dehydrating agent for many sulfonation and nitration processes. In a number of such reactions the boron fluoride may be recovered by distillation as the dihydrate.—R. J. THOMAS, W. F. ANZILOTTI and G. F. HENNINGTON. *Ind. Eng. Chem.*, 32 (1940), 408–410. (E. G. V.)

Inorganic Chemistry—Contemporary, and the Related Sciences. A review.—W. F. JAKÓB. *Roczniki Chem.*, 19 (1939), 68–83; through *Chem. Abstr.*, 33 (1939), 6741. (E. G. V.)

Inorganic Qualitative Analysis—New Method of. An outline is given of a scheme of analysis which carries out the group separations in the usual way but instead of making further separations, characteristic tests, mostly with organic reagents, are made with small portions of solution. Thus much of the time-consuming precipitating and filtering is avoided.—G. EMSCHWILLER and G. CHARLOT. *Ann. chim. anal. chim. appl.*, 21 (1939), 176–180; through *Chem. Abstr.*, 33 (1939), 6743. (E. G. V.)

Iodine. Remarks are devoted to the history, production and importance of this element in modern medicine and chemistry.—KARL DOPF. *Wien. Pharm. Wochschr.*, 72 (1939), 452–453. (H. M. B.)

ORGANIC

Alkaloids

Alkaloids of Stephania Cepharantha Hayata. VI. Method for Systematic Separation. The total alkaloids are treated with acetone; after recrystal-

lization iso-tetrandrine is obtained. By evaporation of the mother liquor, treatment of the residue with hydrochloric acid, then with potash and with ether, there is obtained, from the potash solution, berbamine (in the form of a benzene addition product) and an amorphous phenolic base; from the ether solution there is obtained cepharanthine (also as a benzene addition product), crystalline methyl-isochondrodendrine and an amorphous base.—H. KONDO, M. TOMITA, M. STAOMI and T. IKEDA. *J. Pharm. Soc. Japan*, 58 (1938), 276–279; through *Chimie & Industrie*, 42 (1939), 674. (A. P.-C.)

Alkaloids of Twan Chan Tsao Found in Kwangsi. Twan Chan Tsao, probably belonging to the species *Gelsemium*, was percolated with 95% alcohol. The alcohol extract was concentrated to a small volume under reduced pressure and the residue was dissolved in 2% hydrochloric acid. After filtration the filtrate was neutralized with sodium carbonate to precipitate the alkaloids, which was then extracted first with ether and then with chloroform. The yields of crude alkaloid from different parts of the plant were: roots 29 Gm., stems 20 Gm., leaves 80 Gm. (7 kilos of material having been used for the extraction in all three cases). The alkaloid gives a hydrobromide that melts at 287° C.—I. F. CHEE, S. T. LEE and C. S. LEE. *J. Chem. Eng. China*, 5 (1938), 40–41; through *Chimie & Industrie*, 42 (1939), 672–673. (A. P.-C.)

Aspidospermine from Vallesia Glabra and Vallesia Dichotoma. In a study of Argentine plants, the alkaloid occurring in *V. glabra* and *V. dichotoma* has been identified as aspidospermine. In both instances the identification was made by Ervins' method (*J. Chem. Soc.*, 105 (1914), 2738) which consists of transforming the alkaloid into deacetyl-aspidospermine and aspidosine.—V. DEULOFEU, J. DE LANGHE, R. LABRIOLA and V. CARCAMO. *J. Chem. Soc.*, (1940), 1051–1052. (W. T. S.)

Belladonine. Belladonine is formed by prolonged heating of apoatropine. The composition of the crystalline base corresponds to the formula $(C_{17}H_{21}NO_2)_x$; it is therefore a polymerization product, probably a dimer, of apoatropine. The hydrochloride and sulfate are easily soluble in water.—W. KÜSSNER. *Arch. Pharmazie*, 276 (1938), 617–620; through *Chimie & Industrie*, 42 (1939), 675. (A. P.-C.)

Datura Alba Nees, Philippine—Alkaloids of, and the Fixed Oil of the Seeds of. The fatty oil is obtained from the dried powdered seeds by petroleum ether extraction. Yield 11.96%; sp. gr. at 28° C., 0.9225; n_D^{25} 1.4730; $[\alpha]_D^{25}$, none; coeff. viscosity, 0.9949 poise; relative viscosity, 11.90; kinematic viscosity, 0.10750; surface tension, 30.024 dynes/cm.; congealing point, -14.3° C.; acid value, 46.31; saponification value, 189.00; iodine value, 84.65; acetyl value, 42.28. The fat-free seeds were made alkaline with 3% ammonia solution, dried and extracted with chloroform. This gave mostly hyoscyne and minute traces of hyoscyamine. Only hyoscyne was identified in the pericarps, leaves and stems.—PRADISTH CHEOA-SAKUL and ALFREDO C. SANTOS. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 163. (P. A. F.)

Ergometrine—Manufacture of Stable Preparations Containing. Preparations of ergometrine (or ergot extracts) and ascorbic acid are claimed.—N. V. ORGACHEMIA. Brit. pat. 509,709; through *J. Soc. Chem. Ind.*, 59 (1940), 173. (E. G. V.)

Ergot—Alkaloid Content of. I. Determination of Alkaloid in Various Samples. The samples (average weight 0.15 Gm.) are ground, freed from fat by treatment in a percolator with light petroleum (fat content 23–37%), mixed with magnesium oxide, moistened with distilled water, mixed with sand and

shaken with ethyl ether for 1 hour. The ethereal extract is shaken for 20 minutes with 1% aqueous tartaric acid and the alkaloid content of the aqueous portion determined by the method of Schlemmer, *et al.*, a Pulfrich colorimeter being used. The aqueous solution is not freed from ethyl ether or filtered. A correction is applied to allow for alkaloid not removed from the ethyl ether. Since the content of the various alkaloids varies greatly, standard curves are plotted for samples of different origin. The total alkaloid varies from 0 to greater than 1%. The error of the method is $\pm 15\%$.—N. VON BEKESY. *Biochem. Z.*, 302 (1939), 187–197; through *J. Soc. Chem. Ind.*, 59 (1940), 85. (E. G. V.)

Ergot Alkaloids—Microscopic Studies on. V. The alkaloids have, in general, good crystallization power. In addition to the solvent-free crystals, numerous addition products of the alkaloids with various solvent media were examined optico-crystallographically. The great variety of the solvent-containing crystal forms are so produced that some of the ergot alkaloids, like ergometrine, pseudo-ergotinine and ergocristine, are able to form several kinds of molecular compounds with certain solvents. The largest number of addition products were obtained with ergometrine; among them were a group of monoclinic isomorphous forms. Ergometrinine nearly always crystallizes solvent-free, only one molecular compound with benzene being known. Ergocristine can crystallize only with a solvent. So far compounds of ergocristine can be obtained from acetic acid and benzene, which are similar to the corresponding molecular compounds of ergot-oxine, but are optico-crystallographically different from one another. Pseudoergotinine, ergocristine and the ergotinine described by the author in *Arch. Pharmazie*, 276 (1938), 40–45, are very similar; they are isomorphous. The investigation showed that all the ergot alkaloids examined yield well-defined and characteristic crystals, the identification of which presents a valuable aid.—A. KOFLER. *Arch. Pharmazie*, 276 (1938), 525–544; through *Chimie & Industrie*, 42 (1939), 674. (A. P.-C.)

Lobelia—Contents of Alkaloids in the Cultivated and in the Wild Types of. A maximum alkaloid content is obtained in plants in the middle of the blossoming period and in the morning and evening harvestings. In the wild lobelia the content of the alkaloids was lower than in the cultivated. Growing in sunlight increased the accumulation of alkaloids. *Lobelia inflata* contains 0.134% to 0.635% alkaloids, depending on the conditions of growth and harvesting.—V. P. KALASHNIKOV. *Farmatsiya*, (1939), No. 1, 20. The total alkaloid content of *L. sessilifolia* L. is 0.135%, of *L. siphilitica* L. 0.152%; only traces of alkaloids were found in the water lobelia, *L. dortmanna* L. In *L. inflata* lobeline constituted 3–50% of the total alkaloids. Much difficulty was encountered in the purification of lobeline from the tarry substances which were found in all extracts. Natural lobeline is less toxic than the synthetic; it is more stable in aqueous solutions and has a greater effect on respiration.—*Ibid.*, No. 2-3, 24; through *Chem. Abstr.*, 34 (1940), 4227. (F. J. S.)

Lupine Studies. XIV. Isolation of Anagyrene from Lupinus Laxiflorus var. Silvicola C. P. Smith. Dry *Lupinus laxiflorus* var. *silvicola* C. P. Smith contains 0.7–1% of alkaloids, principally anagyrene. Cytisine, methyleytisine and sparteine were not found in the plant. Anagyrene gives a characteristic blue color in the modified Grant test for sparteine.—J. F. COUCH. *J. Am. Chem. Soc.*, 61 (1939), 3327. (E. B. S.)

Monocrotaline—Structure of, the Alkaloid in Crotalaria Spectabilis and Crotalaria Retusa. I.

The alkaloid, monocrotaline, is extracted by ethanol in good yields from *Crotalaria spectabilis* or *Crotalaria retusa*. It has the formula, $C_{16}H_{23}O_6N$, and resembles the alkaloids occurring in various species of *Senecio*, *Heliotropium*, *Trichodesma* and *Erechtites*. Monocrotaline undergoes alkaline hydrolysis to retronecine, $C_8H_{13}O_2N$, and an optically inactive, monobasic acid, $C_7H_{12}O_6$, called monocrotic acid. By hydrogenolysis monocrotaline gives retronecanol, $C_8H_{15}ON$, and an acid designated as monocrotalic acid, $C_8H_{12}O_6$. It has been shown that monocrotalic acid is optically active, monobasic, and upon treatment with alkali gives the optically inactive acid, monocrotic acid, obtained by alkaline hydrolysis of the alkaloid.—R. ADAMS and E. F. ROGERS. *J. Am. Chem. Soc.*, 61 (1939), 2815. (E. B. S.)

Morphine and Hydroxydimorphine—Analysis of Tissues Containing Both. By means of three biological tests extracts containing morphine or hydroxydimorphine can be differentiated from those containing a mixture of the two alkaloids. The first of these assays is based on the fact that morphine alone intensifies the action of acetylcholine of the denervated non-esterinated dorsal muscle of the leech. The second is based on Straub's test which consists in noting the percentage of mice exhibiting a characteristic rise of the tail after hypodermic injection of morphine hydrochloride; hydroxydimorphine acts similarly, but at much higher doses. Both alkaloids exert an inhibiting action on the contractions of the dorsal leech muscle produced by choline esters.—DENISE G. FICHTENBERG. *Compt. rend. soc. biol.*, 130 (1939), 316-319; through *Chimie & Industrie*, 42 (1939), 450. (A. P.-C.)

Nicotine and Anabasine—Determination of, When Present in a Mixture. The total alkaloid content is determined by titration. The acetyl derivative of anabasine does not form a picrate and nicotine does.—M. F. KHMURA. *Vsesoyuz. Nauch.-Issledovatel. Inst. Tabach. i Makhoroch. Prom.*, No. 140 (1939), 97-102; through *Chem. Abstr.*, 34 (1940), 4862. (F. J. S.)

Nicotine Derivatives—Preparation of. The preparation is claimed of unimolecular compounds of nicotine and mercaptoarylenethiazoles of the benzene and naphthalene series by heating the components together at 90-100° (or, using the corresponding disulfides, at 100-110°). The products are soluble in ketonic solvents. Examples are the compounds from *l*-thiolbenzthiazole and its 5-phenyl derivative.—R. L. Sibley, assignor to MONSANTO CHEM CO. *U. S. pat.* 2,077,960; through *J. Soc. Chem. Ind.*, 59 (1940), 173. (E. G. V.)

Opium—Analysis of an, Cultivated in Italy. Opium from two crops of poppies (1937, 1938) cultivated at Reggello, Tuscany, gave the following analytical results: morphine 7, 8.25%; aqueous extract 32, 33%; moisture 14, 10%; ash 4.6, 5%.—MARIA CORAZZA. *Arch. farmacol. sper.*, 67 (1939), 18-21; through *Chimie & Industrie*, 42 (1939), 672. (A. P.-C.)

Papaverine—Color Reaction for the Identification of. Treat papaverine with concentrated nitric acid and then add an equal quantity of concentrated sulfuric acid; a stable orange-red color is produced, which turns to an amorphous brown precipitate on diluting with water.—Y. Y. GORNI. *Farm. Zhur.*, 12 (1939), No. 1, 26-27; through *Chimie & Industrie*, 42 (1939), 1027. (A. P.-C.)

Quinine Phosphate—Solubility and Stability of. The solubility of this compound in water was found to be 1 Gm. in 450 cc. It was found to gain weight in moist air, to lose moisture in dry air and the relative humidity at which it is stable at room temperature is 32-44%.—R. K. SNYDER. *Bull. Natl. Formulary Committee*, 9 (1940), 47-49. (H. M. B.)

Strychnine—Colorimetric Determination of. An expeditious method for the determination of strychnine in nux vomica is described. The procedure involves the rapid extraction of the total alkaloids by addition of piperazine to the powdered seed followed by treatment with boiling tetrachloroethylene, transference of the extracted alkaloids to dilute aqueous solution of sulfuric acid and isolation of the strychnine as the ferrocyanide. The precipitation of strychnine ferrocyanide is rendered strictly quantitative by the addition of oxalic acid followed by momentary freezing. The determination is finally concluded by applying Malaquin's color test as modified by Denigès. Procedures are described for the assay of nux vomica preparations in which the initial extractions are conducted by the use of chloroform after preliminary treatment with alcoholic solution of potassium hydroxide.—J. ALLEN and N. L. ALLPORT. *Chemist and Druggist*, 132 (1940), 435. (A. C. DeD.)

Essential Oils and Related Products

Artemisia Baldshuanica—Essential Oil of. The fresh plant yields 0.18-0.36% of oil, containing α - and β -thujone 60, thujol (free and as acetate and isovalerate) 16% and an unidentified alcohol.—I. TZUKERVANIK and L. GRATSCHE. *Acta Univ. Asiae Med.*, 41 (1937), 1-5; through *J. Soc. Chem. Ind.*, 59 (1940), 170. (E. G. V.)

Bulgarian Rose Oil Production. During 1939, 2800 kilos of rose oil were produced in Bulgaria, compared with 1690 during the preceding year.—ANON. *Chemist and Druggist*, 132 (1940), 454. (A. C. DeD.)

Evodia Littoralis—Essential Oil of. According to the authors steam distillation of the leaves of young trees of *Evodia littoralis*, growing in quantity near the New South Wales border, yields an oil with the following constants: specific gravity at 15.5°, 0.8487; specific rotation, 16.5°; refractive index, 1.4860; ester value, 0; acetyl value, 36. The oil was shown to contain ocimene, *d*- α -pinene, a mixture of sesquiterpenes and a new phenolic ketone, melting at 84°, which the authors have called evodionol.—LAHEY and JONES. *University of Queensland Papers* (1939), No. 13; through *Chemist and Druggist*, 132 (1940), 215. (A. C. DeD.)

Ginseng—Investigation of the Essential Oil of. I. Preparation of the Essential Oil. Ginseng root (*Panax quinquefolium*) was freed from dust and earthy matter and was then ground to a fine powder. The pulverized root (1000 Gm.), packed in cheesecloth bags, was extracted with 500 cc. of ether in a special apparatus fitted with a reflux condenser and a siphon for returning the extract to the boiling flask. The extract was filtered through paper in another apparatus, especially devised for this work, and the ether was removed by distillation. The last traces of solvent were removed by maintaining the flask containing the distillation residue at 50° for 10 hours. Ginseng oil was obtained as a brownish residue in a yield of approximately 0.8%.—HAROLD J. TORMEY and FRANCIS M. Y. CHENG. *St. Bonaventure Sci. Studies*, 7 (1939), No. 4, 9-13; through *Chem. Abstr.*, 34 (1940), 3878. (F. J. S.)

Juniperus Siberica—Essential Oil of. The oil from the twigs contained 90% of *d*- α -pinene, with traces of camphene and an unidentified sesquiterpene.—I. TZUKERVANIK and L. GRATSCHE. *Acta Univ. Asiae Med.*, 37 (1937), 1-5; through *J. Soc. Chem. Ind.*, 59 (1940), 170. (E. G. V.)

Oil of Cinnamon. Most of the Pharmacopœias recognize oil of cinnamon. It is used for flavoring and as a stomachic, and is obtained from many species of cinnamon plant by distillation of the bark. Sometimes this oil is adulterated by adding the

cheaper cinnamon leaf oil or distilling leaves and bark together. *Cinnamomum cassia* from China, the oil from which is official in the U. S. P. XI, has as common adulterants fatty oils, cedar wood oil and gujun baban oil, and also petroleum. These lower the specific gravity and are easily separated out by steam distillation. *Cinnamomum loureirii* from Japan is recognized by the U. S. P. XI as Saigon cinnamon. *Cinnamomum mindanaense* is found in the Philippines and is rich in oil. *Cinnamomum burmanii* is cultivated in Java. It is less delicate than the Ceylon oil. The quality depends on the aldehyde content; the higher the aldehyde content the better is the oil, the range should be between 50% and 70% by volume. Purity is also an essential factor.—KHASEM PANGSRIVONGSE. *Rev. Filipina Med. Farm.*, 30 (1939), 417. (G. S. G.)

Oil of Petitgrain. A survey dealing with the history, development and production, particularly in Paraguay.—ERNEST S. GUENTHER. *Drug and Cosmetic Ind.*, 47 (1940), 638-643, 672. (H. M. B.)

Oleoresin of Cubeb and the Tincture of Cubeb—Volatile Oil Content of. Results indicate that the usual assay procedure for the volatile oil content of cubeb, its tincture and oleoresin is satisfactory. The constants of the distillates of the drug and its preparations are fairly constant except for the refractive index and optical rotation. The following minimum limits of the oil content are recommended: cubeb, not less than 12% v/w; tincture, not less than 2.4% v/v; oleoresin, not less than 40% v/w.—KARL B. ROSEN. *Bull. Natl. Formulary Committee*, 9 (1940), 49-52. (H. M. B.)

Orange oil—Lactone of. The lactone of orange oil, meranzin (also known as auptene), consisted of white crystals melting at 89° C. (corr.), acid value 214-218, formula, $C_{16}H_{16}O_4$. From alkaline solution, an acid, $C_{16}H_{16}O_6$, melting at 151° C. was obtained; it had no tendency to revert to lactone. Structural formulas are given to illustrate the reactions and to indicate relationship to lactones of other citrus oils.—F. D. DODGE. *Am. Perfumer*, 41 (1940), No. 5, 31-33. (G. W. F.)

Sesillii Fedtschenkoanum—Essential Oils of. The fresh plants yield about 0.2% of oil, consisting of *l*- α -pinene 60, camphene 5, *p*-cymene 10, dipentene and limonene 8, and primary alcohols, $C_{10}H_{18}O$ (free and as acetates and formates), 11%, and traces of an unidentified aldehyde.—I. TZUKERVANIK and V. PISHOVA. *Acta Univ. Asiae Med.*, 39 (1937), 1-6; through *J. Soc. Chem. Ind.*, 59 (1940), 170. (E. G. V.)

Violet Oil—Free Eugenol Content of Parma. Extraction of the flowers with light petroleum gives an oil, melting point less than 15°, from which vacuum distillation removes an oil having a herbaceous and peppery odor; the oil reacts with ferric chloride (green), antimony trichloride (yellow-brown), and Bezssonoff's reagent (blue). When extracted with 4% potassium hydroxide it yields eugenol (benzoate, melting point 69°, black), which forms about 21% of the essential oil. The oil from the mixed flowers of Victoria and Parma violets contains small amounts of eugenol.—S. SABETAY and L. TRABAUD. *Compt. rend.*, 209 (1939), 843-845; through *J. Soc. Chem. Ind.*, 59 (1940), 243. (E. G. V.)

Volatile Materials from Coniferous Woods. A discussion of the amounts, properties and composition of volatile oils derived from various coniferous woods.—HEINRICH WIENHAUS. *Holz Roh u. Werkstoff*, 2 (1939), 417; through *Chem. Abstr.*, 34 (1940), 4857. (F. J. S.)

Glycosides, Ferments and Carbohydrates

Carotene and Fat—Coupled Oxidation of, by Carotene Oxidase. Carotene oxidase bleaches

carotene with extreme slowness unless a small amount of fat is present. If an optimal quantity of fat is added, carotene is bleached with great rapidity. Bixin is affected in a similar manner. Highly unsaturated fats like hemp seed oil or soy bean oil are more effective than olive oil or butter. The bleaching action by the enzyme is probably an instance of coupled reaction.—JAMES B. SUMNER and ROBERT J. SUMNER. *J. Biol. Chem.*, 134 (1940), 531. (F. J. S.)

Dextran—Structure of, Synthesized from Sucrose by *Betacoccus Arabinosaceus* Orla-Jensen. The structure of the dextran synthesized by the action of a strain of *Betacoccus arabinosaceus* (*Leuconostoc mesenteroides*) on sucrose was studied. On treatment of this polysaccharide with acid, glucose was obtained as the sole product of the hydrolysis. Its positive rotation and the downward mutarotation during the hydrolysis suggest an *alpha* configuration of the anhydroglucose units in the molecule. On methylation and subsequent hydrolysis of the dextran, 2,3,4-trimethyl- β -methylglucoside was obtained and a small amount of an end group (tetramethylglucose) was isolated. This indicates that the polysaccharide consists of α -glucopyranose units linked through the first and sixth carbon atoms to form terminated chains. The molecular weight of the dextran determined on the methylated derivatives by the Staudinger viscosity method was 11,700. A value of 2600 ± 50 was obtained for its molecular weight with the ultracentrifuge by the sedimentation equilibrium method.—W. Z. HASSID and H. A. BARKER. *J. Biol. Chem.*, 134 (1940), 163. (F. J. S.)

Enzymes—Commercial Manufacture of Bacterial. A review of their manufacture and uses, with bibliography of 24 references (of which 18 are French patent references).—IVAN AUG. EFFRONT. *Chimie & Industrie*, 43 (1940), 3-12. (A. P.-C.)

Glucose—Iodometric Determination of Small Quantities of. Aldehydes can be oxidized to acids by the action of iodine in the presence of sodium hydroxide. By this reaction *d*-glucose, but not fructose, can be determined iodometrically. The following procedure is suitable for 0.2 to 2.0 mg. of glucose: dilute to 10 cc., add 1.00 cc. of decinormal iodine, shake and allow to stand for 1 minute; add 1 cc. of fifth-normal sodium hydroxide and allow to stand for some time; then add 6 cc. of 0.25% hydrochloric acid and titrate the excess of iodine with sodium thiosulfate solution.—E. C. NOYONS. *Rec. Trav. Chim. Pays-Bas*, 58 (1939), 17-22; through *Chimie & Industrie*, 42 (1939), 451. (A. P.-C.)

α - and β -Glycerophosphoric Acids—Comparative Hydrolysis of, by Different Plant Phosphatases. VI. Phosphatase of White Mustard Seed. VII. Phosphatase of Sweet Almonds. Under all experimental conditions the phosphatase of white mustard seed hydrolyzed β - faster than α -glycerophosphate. Probably it is a single enzyme. The action is inhibited by inorganic phosphates, sodium arsenate and sodium fluoride. Magnesium salts have no effect. Strychnine, which inhibits the action of the phosphatase of takadiastase, has a slight accelerating action on mustard phosphatase. Under all experimental conditions almond phosphatase hydrolyzes α - and β -glycerophosphate at the same rate. The optimum p_H is 5.6 to 5.8. The inhibiting action of sodium fluoride increases with the concentration of the substrate. Strychnine has a slight accelerating effect and magnesium salts have a weak inhibiting action. The inhibiting action of ethanol is proportional to the ethanol concentration and inversely proportional to the concentration of substrate.—J. COURTOIS. *Bull. soc. chim. biol.*, 20 (1938), 1359-1375, 1376-1391; through *Chimie & Industrie*, 42 (1939), 674-675. (A. P.-C.)

Invertase—Effect of Acids in the General Meaning of the Term on the Activity of. It has been demonstrated that acids in the general meaning of the term can retard the enzymatic activity of invertase under conditions which purport to hold the degree of ionization of the enzyme constant (that is, conditions such as constant ionic strength and constant p_H). It has been suggested that oxonium ion and acids in general may alter the activity of an enzyme by causing the rupture of intramolecular hydrogen bonds in the enzyme protein. The results of such bond breaking may be the arising of modified forms of the enzyme with more internal degrees of freedom and possessing less catalytic activity.—W. A. WISANSKY. *J. Am. Chem. Soc.*, 61 (1939), 3330. (E. B. S.)

Papain—Crude. Preparation and properties.—A. K. BILLS and R. R. THOMPSON. *Ind. Eng. Chem.*, 32 (1940), 1144–1147. (E. G. V.)

Papaya Latex—Drying of. Reasons for the relative inactivity and poor keeping quality of commercial papain have been sought. It has been found that the enzyme loses much of its activity on drying and shortly thereafter, and still more of it on being diluted just prior to use. Methods for minimizing these losses are suggested. Papaya latex is shown to contain a thermo-stable factor that destroys enzyme activity, apparently through an oxidative process.—A. K. BALLS, H. LINEWEAVER and S. SCHWIMMER. *Ind. Eng. Chem.*, 32 (1940), 1277–1279. (E. G. V.)

Pepsin—Salmon, Preparation and Properties of Crystalline. The pepsin of the Pacific Coast king salmon has been crystallized and the method of preparation is described in detail. An elementary analysis and determinations of tyrosine, tryptophane and cystine contents have been made. The material is a typical protein but the needle type crystalline form and the composition show that this enzyme is distinct from Northrop's pepsin. The enzyme, when prepared by the method described, has a specific activity of about 0.24 Hb unit and is active over a wide p_H range. The presence of salt enhances its activity. The activity of salmon pepsin is less responsive to changes in temperature than the activity of swine pepsin.—EARL R. NORRIS and DANIEL W. ELAM. *J. Biol. Chem.*, 134 (1940), 443. (F. J. S.)

Plant Proteases. I. Activation-Inhibition Reactions. A study was made of the activation-inhibition reactions of three partly purified plant proteases, bromelin of pineapple, asclepain *m* of milkweed, *Asclepias mexicana*, and solanain of horse-nettle, *Solanum elaeagnifolium*. The reactions of bromelin and asclepain *m* resemble those of papain and asclepain *s* (protease of *Asclepias speciosa*) and are indicative of the presence of sulfhydryl as a group essential to the activity of these enzymes. Solanain is not affected by oxidizing or reducing agents, or by reagents which react with —SH groups. This enzyme is, therefore, not a papainase. The inactivations produced by nitrous acid and ketene indicate that phenolic groups may be essential for the activity of solanain. The course of the inactivation of papain by ketene is favorable to the view that phenolic as well as —SH groups are necessary for the activity of this enzyme.—DAVID M. GREENBERG and THEODORE WINNICK. *J. Biol. Chem.*, 135 (1940), 761. (F. J. S.)

Saponins and Sapogenins. XIV. So-called Pyridazine Derivatives of Steroid Diones. The structure of chlorogenin is investigated through the pyridazine derivatives. Considerable evidence is presented to support the claim that the hydroxy groups of chlorogenin do not occupy the 3,6 positions of the sterol nucleus.—C. R. NOLLER. *J. Am. Chem. Soc.*, 61 (1939), 2976. (E. B. S.)

Saponins and Sapogenins. XIII. The Precipitability of Steroid Sapogenins by Digitonin. The solubility of the digitonides of steroid sapogenins varies considerably and is much greater than that of the digitonides of cholesterol and β -cholestanol. Thus the solubility product of the digitonide of sarsasapogenin, which is known to be the less soluble of two epimeric forms, is practically the same as that of the digitonide of *epi*-dihydrocholesterol, which ordinarily is considered as not precipitable by digitonin. Gitogenin digitonide has a much smaller and chlorogenin digitonide has a much larger solubility product than sarsasapogenin digitonide and must, respectively, be considered as the epimer precipitated by digitonin and the isomer not precipitated. The solubility products of steroid digitonides vary so widely that qualitative tests for precipitation are without meaning unless the behavior of both isomers can be compared.—C. R. NOLLER. *J. Am. Chem. Soc.*, 61 (1939), 2717. (E. B. S.)

Starches—Pasting and Identification of. When starches are heated with water, the cloudy suspensions gradually become translucent as pasting occurs. The photoelectric method is used to follow this change at various temperatures, and characteristic curves for each type of starch are secured. Besides indicating the nature of the starch, the curves show progress and completion of pasting. Modified starches show progressive alterations in the curves. By simple mathematical relations the curves may be applied to analysis of mixtures of starches.—W. L. MORGAN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 313–317. (E. G. V.)

Taka-Diastase—Buffer Influence on. At 30° and an ionic strength of 0.05 the saccharogenic action of taka-diastase was found to have an optimum p_H of 5.1 in the presence of formate, acetate, propionate, butyrate, valerate, phenyl acetate and succinate buffers. An optimum p_H of 5.4 was obtained when phthalate and citrate buffers were employed. A variation of the buffer anion was without influence on the relative activity of the enzyme at the p_H optimum and on the alkaline side of the optimum, but on the acid side marked differences in activity were observed.—GERALD A. BALLOU and JAMES MURRAY LUCK. *J. Biol. Chem.*, 135 (1940), 111. (F. J. S.)

Thiazole Pyrophosphate—Inhibition of Carboxylase by. By using the Warburg monometric technique, it has been shown that compounds structurally similar to cocarboxylase (thiamine pyrophosphate) are able to inhibit the activity of the carboxylase system. The most active inhibitor studied was the pyrophosphoric acid ester of the thiamine thiazole moiety (the thiazole pyrophosphate portion of the cocarboxylase molecule). The thiazole was pyrophosphorylated by the method used in the case of thiamine by Weijlard and Tauber. Purification of the crude material was accomplished by conversion to the silver salt and then to the manganese salt. The inhibition phenomenon was explained on the basis of a competition between cocarboxylase and the thiazole pyrophosphate for the specific carboxylase protein with which the two are similarly able to combine. Support is given for this explanation and its extreme significance is pointed out.—EDWIN R. BUCHMAN, ERIK HEGGAARD and JAMES BONNER. *Proc. Nat. Acad. Sci. U. S.*, 26 (1940), 561–563. (W. T. S.)

Tyrosinase from the Wild Mushroom, *Lactarius Piperatus*. A method is described for preparing highly purified preparations of tyrosinase from *Lactarius piperatus*. The tyrosinase is shown to be a copper protein, containing in purest state 0.23% copper. Inactive or only slightly active crystals are obtained from solutions of highly purified tyrosinase in which the copper seems to be in active form.

Possible reasons for this slight activity are: the enzyme becomes, for some unknown reason, inactive when it is crystallized; or an inactive form, such as a proenzyme, accompanies the enzyme as it is purified.—H. R. DALTON and J. M. NELSON. *J. Am. Chem. Soc.*, 61 (1939), 2946. (E. B. S.)

Other Plant Principles

Carotenoids of Hungarian Wheat Flour. The authors' conclusions were (1) Unbleached wheat flour from southern Hungary contains no more than 0.01 mg. of carotene per Kg., if any. Since it is free also from cryptoxanthin, it is valueless as a provitamin A source. (2) Practically the only polyene occurring in the flours investigated is xanthophyll (lutein). Some of the other pigments are isomerization products while the nature of the others is unknown. (3) Through repeated application of the chromatographic method, 15 mg. of pure xanthophyll crystals have been isolated from 60 Kg. of flour.—L. ZECHMEISTER and L. CHOLNOKY. *J. Biol. Chem.*, 135 (1940), 31. (F. J. S.)

Celastrin—Constitution of. III. Further studies on celastrin, a pigment found in the root of *Celastrus scandens*, are reported. Experimental work covered oxidation of celastrin with permanganate, with chromic acid in glacial acetic acid, oxidation of methyl celastrin with chromic acid in glacial acetic acid, reductive acetylation, reactions with bisulfite, sulfurous acid and orthophenylenediamine. Papers I and II showed the constitution of celastrin to be $C_{20}H_{32}O_3$. It is either a mono- or dialkyl substituted β - or α -naphthoquinone.—OLE GISVOLD. *Jour. A. Ph. A.*, 29 (1940), 432. (Z. M. C.)

Charcoals—Activated. In laboratory experiments satisfactory products were prepared from cornstalks and cattails by using zinc chloride or magnesium chloride as an activating agent in known manner.—A. L. REMEZANO. *Anales farm. bioquim. (Buenos Aires)*, 9 (1938), 35-42; through *Chimie & Industrie*, 42 (1939), 673. (A. P.-C.)

Convolvulaceæ Resins—Contributions to the Chemistry of Various. A discussion.—R. JARETZKY and E. RISSE. *Arch. pharm.*, 278 (1940), 379-389. (L. K.)

Glycerol—Ester Content of Distilled. The ester content varies as the non-volatile organic content of the crude aqueous glycerol from which it was prepared, this depending in turn on the nature of the fat hydrolyzed and on the type of catalyst used. Glycerol of low ester content is obtained by distilling crude glycerol purified as follows: the acid aqueous glycerol is heated at 80° for 2 hours with 2-3% of iron turnings, with a current of air through the solution, then made neutral with aqueous calcium hydroxide at 95-100°, and filtered.—V. LOGINOV and G. KUZNETZOVA. *Maslob. Zhir. Delo*, 5 (1939), 15-17; through *J. Soc. Chem. Ind.*, 59 (1940), 114. (E. G. V.)

Gums and Gum Substitutes in Pharmacy and Cosmetics.—H. STANLEY REDGROVE. *Ind. Chemist*, 16 (1940), 145; through *Chem. Abstr.*, 34 (1940), 4861. (F. J. S.)

Menthols—Separation and Determination of Isomeric. A comparison has been made of the value of alcoholic potassium hydroxide and of potassium hydroxide in diethylene glycol for the saponification of isomeric menthyl acetates. In the case of the acetate of *d*-neomenthol and of mixtures containing it, it has been found necessary greatly to increase the time usually specified for hydrolysis, since the *d*-neoester hydrolyzes so much more slowly than other menthol esters. The *d*-neomenthol was obtained by separating it from an isomeric mixture which had been enriched in this lower-boiling material by careful fractional distillation in a 240-cm.

laboratory fractionating unit. The final purification was effected by preparation of the *d*-neomenthol acetate ester and subsequent hydrolysis of the re-crystallized product. The *d*-isomenthol was prepared by separating it from a mixture which had been enriched in this higher-boiling material by careful fractionating as in the previous case. Final purification was achieved through repeated recrystallizations.—R. T. HALL, J. H. HOLCOMB, JR., and D. B. GRIFFIN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 187-188. (E. G. V.)

***n*-Octyl Alcohol—Preparation of Pure.** Hercules oil is oxidized (10% aqueous potassium permanganate) to remove unsaturated compounds and the product hydrolyzed (25% potassium hydroxide). The hydrolyzate is steam distilled and the non-aqueous layer dried and fractionally distilled to give pure *n*-octyl alcohol in 60-63% yield.—G. I. MICHAJLOV, O. I. NIKOLAEVA and V. F. BELSKAJA. *Prom. Org. Chim.*, 6 (1939), 594-595; through *J. Soc. Chem. Ind.*, 59 (1940), 114. (E. G. V.)

***l*- α -Phellandrene—Optically Pure.** By fractional distillation at 1- to 2-mm. pressure in the presence of a small amount of hydroquinone, the authors have prepared a sample regarded as optically pure *l*- α -phellandrene having the following constants: specific gravity at 20°, 0.8324; refractive index at 20°, 1.4724; specific rotation at 20°, 177.4°. The diene value of 186.5 (theoretical 186.6) confirmed the purity of the sample. The authors then showed that for a large number of samples the diene value bore an approximately linear relationship to the optical rotation when optically inactive constituents were present.—HANCOX and JONES. *University of Queensland Papers* (1939), No. 14; through *Chemist and Druggist*, 132 (1940), 215. (A. C. DeD.)

Plant Pigments. I. Phycocyanin of Phormidium Uncinatum Gom. The pigment is extracted from the dried alga by water or 0.1M monobasic potassium phosphate adjusted to p_H 6-6.4 by 0.5N sodium hydroxide. The phycocyanin crystallizes best at p_H 4-4.14. Between 650 and 540 millimicrons the absorption spectrum is identical with that of the phycocyanin isolated from *Aphanizomenon flos aquae* by Svedberg and Katsurai.—M. BOUILLENNE-WALRAUD and L. DELARGE. *Arch. inst. bot., Liege*, 14 (1937), No. 5; through *Chem. Abstr.*, 33 (1939), 7823. (F. J. S.)

Fixed Oils, Fats and Waxes

Alfalfa Seed Oil—Sterols of. I. The unsaponifiable fraction of alfalfa seed oil has been separated into a crystalline substance and an oily mixture. The crystalline substance, from consultation of existing data, is believed to be α -spinasterol. The mixture is being investigated further.—L. C. KING and C. D. BALL, JR. *J. Am. Chem. Soc.*, 61 (1939), 2910. (E. B. S.)

Bellier Index—Use of, in Detection of Arachis Oil in Olive Oils, and Other Applications. This index B, is re-defined as the temperature at which complex solid fatty acids and their potassium salts begin to crystallize from oils treated by the Bellier method. The technique for its determination has been improved. The precipitate which was thought to consist only of solid fatty acids is shown to contain up to 50% of potassium salts of these acids. The index for arachis oil was 38-41, for olive oil 9½-19. It has been used to determine arachis oil in olive oil and in oil from preserved fish, to determine the purity of arachis oil and fatty acids, and to detect oil from the marc of olives in the expressed oil. B values are given for mixtures of palmitic with stearic and with arachidic acids. The Blarez index is defined as the temperature of crystallization of the ether-alcoholic solution of potassium soaps

of fatty acids from fats treated by the Blarez method. Its determination is simpler and cheaper, but it cannot be applied to the determination of arachis oil in oil from preserved fish.—R. MARCILLE. *Ann. chim. anal.*, 21 (1939), 311–321; through *J. Soc. Chem. Ind.*, 59 (1940), 221. (E. G. V.)

Castor Oil—Dehydrated. Uses, chemical nature, sources, by-products and economic considerations are discussed.—D. H. KILLEFFER. *Ind. Eng. Chem.*, 32 (1940), 1466–1468. (E. G. V.)

Castor Oil Dehydration By-Products—Recovery of. Experiments on the recovery of volatile products from the vapors evolved in the vacuum dehydration of the heated crude oil are described. The following products and their yields based on the original weight of crude were obtained. The condensate separates into an aqueous layer (4.5%) containing glycerol, aldehydes and low-molecular weight acids, and into an oily layer (6.1%). The oily layer is steam distilled to yield a distillate containing 3.37% of oenanthol and 1.2% of unidentified compounds (I), and a residue containing 0.5% of original acids (expressed as undecic acid) and 0.75% of I.—I. OSNOS and I. GOLOVISTIKOV. *Maslob. Zhir. Delo*, No. 4 (1939), 27–30; through *J. Soc. Chem. Ind.*, 58 (1939), 1259. (E. G. V.)

Castor Oil—Some Newer Uses of. At the beginning of this century castor oil was used only as a laxative and as Turkey red oil. During the last twenty years the importance of the oil has greatly increased as industrial progress found new and useful applications for it. In the article some of the most recently discovered uses for castor oil are reviewed, together with the processes which have made these applications possible.—I. TAUSKY. *Indian and Eastern Chemist*, 21 (1940), 19. (A. C. DeD.)

Castor Seeds from Philippine Sources—Oil Content of. Cold pressing gave an average of 39.8%, and ether extraction 44.6% of oil. The physical and chemical properties found were in close agreement with those given for castor oil from other sources.—PEDRO G. RIVERA. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 160. (P. A. F.)

Chaulmoogra Oils—Analysis of. IV. *Hydnocarpus Anthelmintica* Oil. V. *Taraktogenos Kurzii* (Chaulmoogra) Oil. The qualitative and quantitative analyses of *Hydnocarpus anthelmintica* and *Taraktogenos kurzii* (chaulmoogra) oils have been made by the methods described in the first article of the series. They are the first quantitative analyses that have been made of these two important medicinal oils. A summary of the characteristics and percentage compositions of the five oils of the chaulmoogra group so far analyzed in this series of articles is given.—H. I. COLE and H. T. CARDOSO. *J. Am. Chem. Soc.*, 61 (1939), 3442. (E. B. S.)

Cod Liver Oil—Investigation of and Preparations of. A discussion.—W. KERN and A. HEESCH. *Arch. pharm.*, 278 (1940), 313–326. (L. K.)

Fats and Fatty Acid Esters—Hydrolysis of. The fats and esters were hydrolyzed in 0.2N potassium hydroxide in a 1:1 volume mixture of ethyl alcohol and benzene, using 0.2 Gm. fat per 100 cc. With small amounts of fat the reaction velocity is constant and independent of the amount of fat, but decreases with large amounts of fat. The rate of hydrolysis increases with increase of potassium hydroxide concentration; with 0.2N potassium hydroxide it decreases and with 0.05N potassium hydroxide it increases, with fall in temperature. With ethyl alcohol-potassium hydroxide in absence of benzene the rates of hydrolysis of castor and perilla oils are greater than those of sardine and olive oils and cacao butter. The rates of hydrolysis of

some triglycerides and esters at 1° and 30° are given.—D. ATHERTON and M. L. MEARA. *J. Soc. Chem. Ind.*, 58 (1939), 355–359. (E. G. V.)

Fats and Oils—Analysis of Commercial. A report of the American Chemical Society Committee.—V. C. MEHLENBACHER, et al., *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 379–384. (E. G. V.)

Fatty Acids—Studies on the Chemistry of the. VI. **The Application of Crystallization Methods to the Isolation of Arachidonic Acid, with a Comparison of the Properties of This Acid Prepared by Crystallization and by Debromination.** **Observations on the Structure of Arachidonic Acid.** The authors summarized their work as follows: (1) Crystallization procedures at low temperature have been applied to the methyl esters of adrenal phosphatides. The methyl arachidonate, contained therein, has been concentrated to 70–75% by these procedures. (2) Five preparations of methyl arachidonate, 87.5–95% pure, prepared by crystallization and distillation have been analyzed and compared with three purer specimens prepared by reduction of methyl octabromoarachidate. (3) The polybromide numbers of the crystallization-distillation specimens averaged 90.7 as compared to 86.3 for the debromination specimens. The significance of these results is discussed. (4) Preliminary data on the structure of arachidonic acid are reported and a tentative structure proposed.—G. Y. SHINOWARA and J. B. BROWN. *J. Biol. Chem.*, 134 (1940), 331. (F. J. S.)

Fatty Oil from Philippine Avocado and Its Use in Pharmacy—Preliminary Report. Mechanical pressing and extraction methods are the most satisfactory. Ether extraction of the old fruit gave 17.73% fatty oil; of the dried seeds 13.01%; pressing the fresh pulp yielded 10.03%. The physical and chemical constituents compared favorably with those of the fatty oil of avocado cultivated elsewhere.—CLARA H. MANOTOK and PATROCINIO VALENZUELA. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 158. (P. A. F.)

Fatty Oils—Rancidity and Changes of Acid Number of, Used in Therapeutics. Almond, cod liver, linseed, rape, castor, sesame, sunflower seed and olive oils were stored under different conditions and their acid numbers were determined after 1, 2, 3 and 6 months. The rancidity was determined by organoleptic tests. Sunflower seed and almond oil seem to become rancid relatively quickly. Castor oil is most stable. Fatty oils can be best stored in small, colorless or green glass, completely filled and kept in darkness. Acid number of almond oil increased from 0.90 to 0.93–9 after 1 month and to 1.03–14 after 6 months; that of cod liver oil from 0.92 to 0.99–1.06 and 1.13–28, respectively; of linseed oil from 2.92 to 3.05–20 and 3.34–52; of rape oil from 0.93 to 0.99–1.13 and 1.15–30; of castor oil from 0.46 to 0.47–50 and 0.52–4; of sesame oil from 0.13 to 0.17–8 and 0.18–30; of sunflower seed oil from 1.76 to 1.85–98 and 2.03–13; of olive oil from 1.27 to 1.29–37 and 1.43–70.—GYÖRGY KEDVESSY. *Ber. ungar. pharm. Ges.*, 16 (1940), 114; through *Chem. Abstr.*, 34 (1940), 4225. (F. J. S.)

Oil of Phaseolus Vulgaris L. When 16 Kg. of powdered material containing 13% of water, are extracted with hot ethyl ether, there are obtained 195 Gm. of oil having d_{16}^{15} 0.9603, n_D^{20} 1.4808, acid value 20.5, saponification value 132.6, iodine value 149.8, Reichert-Meißl value 1.03, Polenske value 2.0. The oil contains 19% of solid fatty acids (mainly palmitic and a little carnaubic acid), 63.3% of liquid fatty acids (mainly oleic, linoleic and isolinoleic acids) and 7% of unsaponifiable matter. The solid and liquid acid mixtures have, respectively, d_{12} 0.9322; n_D^{20} 1.4718; iodine value 33.9, 156.6;

and neutralization value 199.6, 186.8. Two isomeric substances, $C_{20}H_{38}O$, or $C_{21}H_{38}O$, or $C_{21}H_{36}O$, melting at 137–138°, $[\alpha]_D^{25}$ –33.6°, and melting at 151–153°, $[\alpha]_D^{25}$ –45°, respectively, are present in the unsaponifiable material and can be separated owing to their different solubilities in ethyl alcohol, the former being easily but the latter only slightly soluble.—H. ITO. *J. Agric. Chem. Soc. Japan*, 15 (1939), 885–890; through *J. Soc. Chem. Ind.*, 59 (1940), 60. (E. G. V.)

Palm Oils—Composition of Commercial. V. Partial Separation of Palm Oils by Crystallization as an Aid to the Determination of the Component Glycerides. Two palm oils, differing in their respective contents of palmitic and oleic acids, have been examined after preliminary separation by acetone into glyceride fractions of relatively simple composition. A plantation oil from the Cameroons had the following component acids: myristic 1.1, palmitic 45.1, stearic 4.1, hexadecenoic 0.8, oleic 38.6 and linoleic 10.6% (weight). Its component glycerides were approximately "oleo"-dipalmitin 43, palmitodi-"olein" 31, "oleo"-palmitostearin 11, tri-"olein" 6, tripalmitin 5 and dipalmitostearin 3% (molecular), with perhaps up to 1% of steardio-"olein." A native oil from Grand Bassa had component acids: myristic 0.6, palmitic 37.6, stearic 3.7, hexadecenoic 1.4, oleic 50.3 and linoleic 6.4% (weight). Its component glycerides were approximately palmitodi-"olein" 41, "olco"-dipalmitin 31, tri-"olein" 12, "oleo"-palmitostearin 10, tripalmitin and dipalmitostearin (each) 3% (molecular), with perhaps traces of steardio-"olein."—T. P. HILDIRCH and L. MADDISON. *J. Soc. Chem. Ind.*, 59 (1940), 67–71. (E. G. V.)

Pharmaceutical Waxes—Determination of the Ester Value of. Comparison of Koettstorfer's standard method for the saponification of the esters of waxes was made with Berg's modified method, which gives higher results owing to more complete saponification. Berg's modifications consist of: (1) use of a more active solvent (mixture of absolute alcohol and xylene instead of 95% alcohol); and (2) heating over a wire gauze instead of in a water bath.—B. BOBRANSKI and A. KOWALWEWSKA. *Acta Poloniae Pharm.*, 2 (1938), 279–282; through *Chemie & Industrie*, 42 (1939), 672. (A. P.-C.)

Sapindus Drummondii—Composition of the Seeds of. The physical and chemical characteristics of the seed oil of *Sapindus drummondii* have been determined. The fatty acids present consist chiefly of oleic acid, accompanied by smaller amounts of linoleic, palmitic and stearic acids.—O. C. DERMER and L. T. CREWS. *J. Am. Chem. Soc.*, 61 (1939), 2697. (E. B. S.)

Seed Fats—Mixed Unsaturated Glycerides of Liquid. I. Some "Non-drying" Oils. "Non-drying" oils (in which class oleic acid is the preponderant component acid) yield on elaidinization a partly solid fat which can be resolved into fractions of different solubility in acetone. Determination of the saturated, elaidic, oleic and linoleic acids present in each fraction affords data from which the proportions of mixed component glycerides present may be approximately deduced; from the resulting composition of the elaidinized fat that of the original oil follows. Even with an efficient isomerization technique (heating the oil at 220° for a short period with 0.3–0.6% of selenium), loss of linoleic acid by polymerization may occur, and the chief use of the procedure is qualitative rather than quantitative. Figures (obtained by use of the procedure indicated) for the approximate proportions of the component glycerides present in groundnut and almond oils, and in two olive oils of different fatty acid composition, are recorded. A recent specimen of Italian (Tuscany) olive oil differed from similar oils of some

years ago in containing much less oleic (about 65%), and much more palmitic and linoleic acids (about 15% each).—B. G. GUNDE and T. P. HILDITCH. *J. Soc. Chem. Ind.*, 59 (1940), 47–53. (E. G. V.)

Seed Fats of *Allanblackia Floribunda* and *Allanblackia Parviflora*—Fatty Acids and Glycerides of. The component fatty acids of the kernel fat of *Allanblackia floribunda* have been found to be palmitic 3.2%, stearic 56.8%, arachidic 0.2%, oleic 39.4% and linoleic 0.4% (molecular); the component glycerides are chiefly oleodistearin (approximately 76%), with steardioleic (15.5%) and a small amount (5%) of oleopalmitostearin. In *Allanblackia parviflora* kernel fat the component fatty acids have been found to be myristic 1.8%, palmitic 2.5%, stearic 51.6%, archidic 0.2%, and oleic 43.9% (molecular). Compared with *A. floribunda*, it is seen that the total amount of C_{18} acids present in the kernel fats is almost the same, but that in the case of *A. parviflora* the slightly larger amount of oleic acid is accompanied by correspondingly less stearic acid; this is further reflected in the major component glycerides of the *A. parviflora* fat, which consists approximately of oleodistearin 60%, steardioleic 26–29% and oleopalmitostearin 6–9% (molecular).—M. L. MEARA and Y. A. H. ZAKV. *J. Soc. Chem. Ind.*, 59 (1940), 25–26. (E. G. V.)

Sukeso Liver Oil—Sukesyl and Other Alcohols from Commercial. The solid material from the oil consists of sukesyl, ($C_{17}H_{34}O_3$) (identical with the alcohol obtained by Toyama), batyl and chimyl alcohols and the liquid portion of selachyl alcohol $C_{21}H_{42}O_3$, $C_{23}H_{44}O_3$, $C_{25}H_{46}O_3$, $C_{17}H_{34}O_3$, and an unsaturated derivative, $C_{19}H_{36}O_3$, of chimyl alcohol. Catalytic reduction of the liquid portion yields batyl and chimyl alcohols.—Z. NAKAMIYA. *Bull. Inst. Phys. Chem. Res. Japan*, 18 (1939), 777–786; through *J. Soc. Chem. Ind.*, 59 (1940), 149. (E. G. V.)

Turtle Oil—Note on Philippine. The report gives a brief description of the turtle and reports experimental work done on the oil. Constants were determined color tests and tests for vitamins applied and several formulas for creams tried. Results showed that the oil compared favorably with turtle oils obtained in other countries.—PURA VILLARICA and PATROCINIO VALENZUELA. *Jour. A. Ph. A.*, 29 (1940), 437. (Z. M. C.)

Turtle Oils—Chinese. Body, liver and ovary oil from *Ocadia sinensis* Gray showed, respectively: density at 30° 0.9114, 0.9035, 0.9418 (at 40°); index of refraction 1.4648, 1.4618, 1.4722 (at 40°); acid value 0.52, 10.12, 7.58; saponification value 202.10, 203.32, 198.88; iodine value 93.27, 78.98, 102.53; unsaponifiable matter 2.8, 10.7, 6.2%. The main constituents were myristic, palmitic, stearic, zoomaric and oleic acids. Marked color reaction for vitamin A was shown for the liver oil only.—C. HATA and M. FUJIKAWA. *J. Soc. Chem. Ind. Japan*, 42 (1939), 329; through *J. Soc. Chem. Ind.*, 59 (1940), 222. (E. G. V.)

Vitamin A Destruction in Fish Liver Oils. The percentage of vitamin A oxidized in fish liver oils at various peroxide values is independent of the initial concentration of the vitamin. When the percentage of vitamin A oxidized at various peroxide values was determined in a series of oils which had been left exposed to the air, the oils fell into two groups. These groups differ in unsaturation so that this behavior under atmospheric oxidation is probably related to this property. In the oils with higher unsaturation, the percentage of vitamin A oxidized was smaller at various peroxide values than in the other oils at similar peroxide values. Within each group of oils the percentage of vitamin A oxidized is related to the peroxide value of the oil. The higher

the peroxide value of an oil becomes on standing, the larger percentage of vitamin A oxidized. When two samples of oil were stored at different temperatures, less of the vitamin A was oxidized at the lower temperature for the same peroxide value.—E. J. SIMONS, L. O. BUXTON and H. B. COLMAN. *Ind. Eng. Chem.*, 32 (1940), 706-708. (E. G. V.)

Unclassified

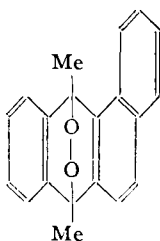
Alkylacetylbarbituric Acids. A series of mono-alkyl barbituric acids was prepared in which an acetyl group was substituted on the 5-carbon atom. Pharmacological tests on these acids and their oximes showed that they had very low toxicity, but no hypnotic properties.—A. V. KIRSANOV and I. N. IVACHTCHENKO. *J. Obchtch. Khim.*, 8 (1939), 1576-1582; through *Chimie & Industrie*, 42 (1939), 856. (A. P.-C.)

Alkylamino Derivatives of 6-Nitro and of 6-Chloroquinazolines. The condensation products of 3,4-dihydro-4-oxo-6-aminoquinazoline with *m*-phenylenediamine possess considerable bacteriostatic activity toward streptococci and the bacilli of Bang's disease, and also a certain therapeutic activity.—O. IOU, MAGIDSON and GOLOVTCHINSKAIA. *J. Obchtch. Khim.*, 8 (1938), 1797-1809; through *Chimie & Industrie*, 42 (1939), 675-676. (A. P.-C.)

Amber in Culture, History, Pharmacy, Chemistry and Technology.—FRIDO KORDON. *Wien. Pharm. Wochschr.*, 73 (1940), 232-234. (H. M. B.)

2-Aminopyridine-5-Sulfonamide and Its Derivatives. A series of therapeutic compounds exerting a microbicidal action were prepared from 2-chloropyridine-5-sulfonyl chloride, of which one of the chlorine atoms is more easily substituted than the other, permitting of substituting them successively by different radicals. The general formula of the compounds obtained corresponds to: $R''R'''NC_6H_4SO_2NR'R$, in which R , R' , R'' and R''' , are phenyl, ethyl, butyl, allyl, benzyl or hydrogen. All the products were well tolerated.—C. NAEGELI, W. KÜNDIG and H. BRANDENBURGER. *Helv. Chim. Acta*, 21 (1938), 1746-1756; through *Chimie & Industrie*, 42 (1939), 519. (A. P.-C.)

Aromatic Hydrocarbons—Polycyclic. Homologs of 1:2-benzanthracene with substituents at position 9 or 10 (or both) give photo-oxides when oxygen is passed through their dilute solutions in carbon disulfide, exposed to light. This behavior appears unrelated to the carcinogenic activity of the hydrocarbons. The photo-oxide of 9:10-dimethyl-1:2-benzanthracene is shown to have this structure



—J. W. COOK and RICHARD H. MARTIN. *J. Chem. Soc.*, (1940), 1125-1127. (W. T. S.)

Creosote—Production of Medicinal. The preparation of medicinal creosote from the technical product was carried out by (1) adsorption of neutral oils on carbon, (2) removal of neutral oils with steam and (3) extraction of neutral oils with ether. The respective yields were 5.24, 6.38% and 8%. Advantages and limitations of all three methods are discussed.—G. P. KRIVOKHATSKIĬ. *Mill. Kirov-*

forstlech. Akad. (U. S. S. R.), 54 (1939), 16; through *Chem. Abstr.*, 34 (1940), 3879. (F. J. S.)

Cystine Production—United States. Cystine, a compound obtained from hair, feathers and other keratinous materials, has applications in cancer research and substantial quantities are required for this purpose in the United States. The process of manufacture (which is given) consists essentially of hydrolysis, precipitation and subsequent purification.—ANON. *Chemist and Druggist*, 132 (1940), 201. (A. C. DeD.)

Dehydroandrosterone into Progesterone—Conversion of. This conversion is carried out through the following intermediate stages: dehydroandrosterone acetate, cyanhydrin, nitrile, 5,16-pregna-3,20-diene-3-ol-20-one, 16 dehydropregesterone and finally progesterone, the yield of the latter being about 40% of the dehydroandrosterone. 16-Dehydropregesterone possesses no estrogenic activity, but it produces a slight growth of the cock's comb.—A. BUTENANDT and J. SCHMIDT-THOME. *Ber. deut. chem. Ges.*, 72 (1939), 182-187; through *Chimie & Industrie*, 42 (1939), 855. (A. P.-C.)

Desoxycorticosterone and Its Esters or Ethers—Process for Preparation of. The products are prepared from the halogenide of 3-hydroxyactiocholic acid. In diazotizing the halogenide, 4 molecules of diazomethane are used per molecule of halogenide of the acid. Separation of the resultant diazoketone is effected by chromatographic adsorption.—SCHERING A. G. Belg. 433,044, April 29, 1939. (A. P.-C.)

5,5-Diethyl- and Phenylethyl-Barbituric Acids and Their Salts. The pH of 0.002 to 0.05 molar solutions of phenobarbital sodium lies between 8.27 and 8.67. For the titration of phenobarbital with sodium hydroxide, a mixture of phenolphthalein and naphtholphthalein is more suitable than thymolphthalein or phenolphthalein alone. Two tautomeric forms can be admitted for phenobarbital, lactame and lactime, the latter being the more dissociated of the two.—R. CERNATESCU and MRS. E. VASCAUTANU. *Ann. Sc. Univ. Jassy*, 25 (1939), 9-31; through *Chimie & Industrie*, 42 (1939), 670. (A. P.-C.)

4:4'-Dimethoxy- α,α -diethylstilbene—New Synthesis of. 4:4'-Dimethoxy- α,α -diethylstilbene (I), first obtained by Robinson *et al.* (*Nature*, 141 (1938), 247), has now been prepared by means of molecular rearrangements. Laboratory directions are given for preparing α,β -dihydroxy- α,β -di-*p*-anisylbutane (II) along with methods for converting it into I by different routes. Refluxing II with acetic and oxalic acids gave α,α -dianisyl- β -butanone (III). Treatment of III with $POCl_3$ in toluene gave I and some α,α -dianisyl- β,β -diethylstilbene. II was converted to α,α -dianisyl- α -ethylacetaldehyde from which I was also obtained.—ERVIN PÉTERI. *J. Chem. Soc.*, (1940), 833-835. (W. T. S.)

Hexestrol. After intensive research Campbell, Dodds and Lawson (1938) isolated the highly active polymer of anol, and this was found to be the hydrogenated form of stilbestrol in which the double bond between the two carbon atoms had been removed. It can be prepared synthetically in better yields and by simpler methods than by the polymerization of anol. Thus, it can be obtained by the hydrogenation of stilbestrol or by direct synthesis from anethol. Since the substance contains two asymmetric carbon atoms, it can exist either in a racemized form or in a meso form—*i. e.*, either externally or internally compensated. The highly active hexestrol, which is being investigated clinically, is thought to be the meso form with a melting point of 184°C.—P. M. F. BISHOP, R. K. BOWES,

M. BOYCOTT, R. KELLAR, T. N. MACGREGOR and B. C. MURLESS. *Lancet*, 238 (1940), 629.

(W. H. H.)

Iodobismuthate of 2-Ethoxy-6,9-diaminoacridine. This new compound was prepared by treatment of $\text{Bi}_2(\text{CO}_3)_3$ with HCl and powdered KI and addition of a solution of 2-ethoxy-6,9-diaminoacridine-HCl. After prolonged shaking, a red amorphous powder precipitated out, which was slightly soluble in the common solvents.—ITALO BOCCHI. *Ateneo parmense*, 11 (1939), 450; through *Chem. Abstr.*, 34 (1940), 3879. (F. J. S.)

Lactic Acid in Solid Form. Preparations containing as high as 65-70% free acid were obtained by the addition of calcium lactate, in the ratio of 1 mol. of the latter to 6 mols. of lactic acid.—ALFRED HÄUSSLER. *Süddeut. Apoth.-Ztg.*, 80 (1940), 111; through *Chem. Abstr.*, 34 (1940), 4525. (F. J. S.)

Matico Camphor. Matico camphor is a bicyclic, simple, unsaturated, sesquiterpene alcohol which is converted into an azulene on dehydrogenation.—HORST BÖHME. *Arch. pharm.*, 278 (1940), 377-379. (L. K.)

Metanethol—Structure of. Of the two isolated dimeric forms of anethol, little is known of the crystalline dimeride metanethol. Several methods are known for the preparation of metanethol but the present authors have obtained it in a 24% yield by heating anethol with 43% sulfuric acid. The liquid dimeride *isoanethol* was produced simultaneously in a 70% yield. Several reactions of metanethol are described but its production from *isoanethol* by stannic chloride in chloroform and its conversion by chromic acid to 2-anisoylanisic acid shows it to be a hydrindene derivative.—WILSON BAKER and J. ENDERBY. *J. Chem. Soc.*, (1940), 1094-1098. (W. T. S.)

Naphthols—Formation of, from Alcohols and Ketones of the Hydronaphthalene Group. The dehydrogenation of the following substances in the liquid phase over a palladium catalyst has been studied: α -Tetralone, ar- and ac- β -tetralols, *trans*- α -decalone, *cis*- and *trans*- β -decalones, *cis*- and *trans*- β -decalols. All these substances yield mixtures of the appropriate naphthol (α - or β -) and naphthalene; *trans*- β -decalone also yields some β,β -dinaphthyl. Comparatively drastic conditions are necessary to dehydrogenate the substances furthest removed from the aromatic type and there is then a greater tendency for the elimination of the oxygen atom. An improvement can be effected in many cases by the addition of a diluent, but the mixture must be kept in a state of ebullition. Tetralin is readily dehydrogenated in the liquid phase only when it is actually boiling. There is a rapid catalytic dehydrogenation when the liquid is made to boil at 185° by reduction in pressure or addition of a diluent, but none in the tranquil liquid at 200°.—R. P. LINSTAD and K. O. A. MICHAELIS. *J. Chem. Soc.*, (1940), 1134-1139. (W. T. S.)

Neopregnane-3,20-Diones and Their Derivatives—Process for the Preparation of Saturated and Unsaturated. Neopregnane-3-ol-20-ones or neopregnane-3,20-diols are treated with oxidizing or dehydrogenating agents.—Soc. POUR L'INDUSTRIE CHIMIQUE À BAËLE. Belg. pat. 433,017, April 29, 1939. (A. P.-C.)

Oxamide—Formation of, by Oxidation of Dehydroascorbic Acid in Ammoniacal Solution by Means of Hydrogen Peroxide. An ammoniacal solution of *l*-ascorbic acid oxidized by means of quinone, on treating with hydrogen peroxide yields oxamide; this property is due to dehydroascorbic acid and not to its transformation products. Ammonia can be replaced by a primary amine the corresponding substituted oxamide of which is insoluble:

normal and *isobutylamine*, cyclohexylamine. The yields obtained are comparable with those produced by air oxidation of solutions of ascorbic acid and of these amines.—J. FARROD. *Bull. soc. chim. France*, 6 (1939), 392-396; through *Chimie & Industrie*, 42 (1939), 519. (A. P.-C.)

8-Phenyl-Hetero-Uric Acid. A description is given of the preparation of 1-phenyl-3-carbethoxy-4-nitroso-pyrazolon; 1-phenyl-3-carbethoxy-4-amino-pyrazolon; the benzoyl derivative of the amino compound; 8-phenyl-hetero-uric acid; 1,3,7-trimethyl-8-phenyl-hetero-uric acid; and 2,6,9-trichloro-8-phenyl-hetero-purine.—GERHART SIEWERT. *Arch. pharm.*, 278 (1940), 327-333. (L. K.)

Phosphodichloride of 4-Aminobenzenesulfonamide—Process for the Preparation of. 4-Aminobenzenesulfonamides or their salts are heated with phosphorus oxychloride.—PRODUIT ROCHE, Soc. ANON. Belg. pat. 433,973, May 31, 1939. (A. P.-C.)

Progesterone and Neoprogesterone—Preparation of, from Dehydroandrosterone. By condensation of dehydroandrosterone acetate with dichloropropionic ester and decarboxylation of the acids isolated from the reaction mixture, there is obtained both progesterone and also neoprogesterone which seems to be the 17-epimer of progesterone. The activity of these two isomers is practically the same.—K. MIESCHER and H. KAGI. *Helv. Chim. Acta*, 22 (1939), 184-195; through *Chimie & Industrie*, 42 (1939), 678. (A. P.-C.)

Snake Venoms. IX. If the venom of *Naja tripudians* is hydrolyzed by means of hydrochloric or formic acid, after 24 hours thiolic groups can be detected in the product. These groups cannot come from cystine or methionine; it must therefore be admitted that in *Naja tripudians* the neurotoxin part of the sulfur is in the form of a hydrolyzable $R\text{SCH}_2$ group, or, more generally, $R\text{S.R}$, where R is a radical that can be hydrolyzed by acids.—F. MICHEEL. *Ber. deut. chem. Ges.*, 72 (1939), 68-72; through *Chimie & Industrie*, 42 (1939), 675. (A. P.-C.)

Sterol-Estrone Group—Studies in. Derivatives of 2-Phenylcyclohexanone. Hydrophenanthrene derivatives related to *o*-methylhomoeosteric acid are most difficult to prepare. Ethyl 5-carbethoxy-2-phenyl-5-methylcyclohexanone-6- β -propionate was deemed a valuable material for this acid and related compounds. Pairing ethyl sodiophenylmalonate with the CH_2I of δ -diethylaminobutan- β -one yielded ethyl 2-carbethoxy- γ -acetyl- α -phenylbutyrate which on hydrolysis and decarboxylation gave γ -acetyl- α -phenylbutyric acid. This acid was converted to the desired starting material by an extension of the synthesis used by Bardhan and Ganguly (*J. Chem. Soc.* (1936), 1852) for preparing related alicyclic compounds from mesitonic acid and by R. Chakravarti (unpublished) from γ -acetyl- β,β -dimethylbutyric acid.—J. C. BARDHAN. *J. Chem. Soc.*, (1940), 848-850. (W. T. S.)

Sulfanilamide—Process for Preparing Water Soluble and Injectable Compounds of. Sulfanilamides are heated with phosphorus halides and the resultant products are made to react with ammonia or alkylamines.—PRODUITS ROCHE, Soc. ANON. Belg. pat. 433,569, April 29, 1939. (A. P.-C.)

Sulfonamide Group of Drugs—Chemical Relationships of the. A brief discussion of the properties, chemical relationships, absorption and excretion, toxicity, mode of action, methods of estimation, comparative costs, and legislation of compounds in which (a) the linkage is through the primary amino group of the *p*-phenylsulfonamide molecule (proseptasine or *p*-benzylaminophenylsulfonamide, soluseptasine), (b) the linkage is through the sulfon-

amide group (M. & B. 693 or 2-sulfanilylamino-pyridine, uleron) and (c) the primary amino group is diazotized and coupled with another aromatic amine to produce an azo dye (prontosil, prontosil soluble).—A. F. CALDWELL. *J. Malaya Branch Brit. Med. Assoc.*, 3 (1939), 47; through *Chem. Abstr.*, 34 (1940), 3876. (F. J. S.)

Sulfur, Selenium and Tellurium—Organic Derivatives of. I. The author has studied the action of hydrogen sulfide, selenide and telluride on the addition complex benzoyl chloride-pyridine and on chloral hydrate. Treatment of the complex with H_2S gave dithiobenzoyl oxide, $(C_6H_5-CS)_2O$, (I) and some thiobenzoic acid. Oxidation of I by 50% HNO_3 produced dibenzoyldisulfone and by concentrated HNO_3 produced benzoic acid. Boiling I with aniline gave benzanilide but no thiobenzanilide. Treatment in a similar manner of the benzoyl chloride-pyridine complex with H_2Se gave α -selenobenzoic acid instead of the expected diselenobenzoyl oxide. α -Tellurobenzoic acid could not be prepared by the same procedure. *Bis-(\beta,\beta,\beta*-trichloro- α -hydroxyethyl) sulfide was obtained by saturating an ethereal solution of pure chloral with H_2S . An improved method is described for preparing this compound. The selenium analog was obtained but proved very unstable.—DAVID T. LEWIS. *J. Chem. Soc.*, (1940), 831-832. (W. T. S.)

Testosterone—Partial Reduction of Androstenedione to. Androstenedione can be partially reduced into testosterone, not only by biochemical means, but also by direct chemical means, by means of tertiary aluminum butylate and absolute secondary butyl alcohol in benzene solution.—K. MIESCHER and W. H. FISCHER. *Helv. Chim. Acta*, 22 (1939), 158-160; through *Chimie & Industrie*, 42 (1939), 678. (A. P.-C.)

Wolfenstein's Dehydrosparteine—Oxidative Degradation of. It was found impossible to produce a progressive oxidative degradation of sparteine and of Wolfenstein's dehydrosparteine; in both cases oxygenated oxidation products were obtained containing the same number of carbon atoms as sparteine. It can therefore be admitted that in these compounds the two outer nuclei remained untouched. Only dehydro- or didehydro-sparteine prepared by Winterfeld and Rauch by means of mercuric acetate undergo progressive oxidative degradation.—K. WINTERFELD and M. SCHIRM. *Arch. Pharmazie*, 276 (1938), 544-552; through *Chimie & Industrie*, 42 (1939), 674. (A. P.-C.)

BIOCHEMISTRY

Acetone and Acetoacetic Acid—Determination of, in Blood by the Bisulfite-Binding Method and Its Relation to Pyruvic Acid. A simple method for determining acetone plus acetoacetic acid depending on bisulfate-binding of the carbonyl groups is described. These compounds are completely bound with bisulfite in Folin-Wu filtrates freed of sugar and addition products are stabilized in the presence of a large excess of sodium bisulfite at low temperatures. Evidence is presented showing that this method can be used to determine blood carbonyl compounds, expressed as acetone. The relation between bisulfite-binding substances and pyruvic acid is clarified. Since pyruvate is included in the values for the bisulfite-binding substances, its exact estimation should be carried out by the more specific dinitrophenylhydrazine procedure.—DANIEL KLEIN. *J. Biol. Chem.*, 135 (1940), 143. (F. J. S.)

Androstenedione and Testosterone—Bacterial Hydrogenation of. Hydrogenation of androstenedione and of testosterone by extract of bull testes is due exclusively to putrefying bacteria; in the first case there is obtained a good yield of etiochol-

anedione and in the second, of epi-etiocholanediol. Contrary to bacterial hydrogenation, hydrogenation by yeast does not take place at the conjugated systems of the steroid group.—L. MAMOLI and G. SCHRAMM. *Ber.*, 71 (1938), 2083-2086; through *Chimie & Industrie*, 41 (1939), 1149. (A. P.-C.)

Ascorbic Acid—Effect of, on Iminazole Rings and Allied Substances in Vivo. The iminazole ring of thionine is split hydrolytically, *in vitro*, by ascorbic acid. Blood thionine of guinea pigs, man and rabbit is unaffected by ascorbic acid *in vivo*. Blood uric acid in man is also unaffected. The iminazole ring of histamine is probably untouched by ascorbic acid *in vivo*, as measured by its hormone-like effect on the gastric secretion of hydrochloric acid.—I. J. GREENBLATT and A. PECKER. *J. Biol. Chem.*, 134 (1940), 341. (F. J. S.)

Ascorbic Acid in Blood—Notes on the Determination of. A discussion of various methods. Bezzsonoff's and Wahren's methods are the ones which give the most consistent results.—CHARLOTTE REISS. *Compt. rend. soc. biol.*, 131 (1939), 522-525; through *Chimie & Industrie*, 42 (1939), 636. (A. P.-C.)

Barbiturate Poisoning—Detection of. Human barbiturate poisoning in the early stages cannot always be detected by examination of the urine; hence blood should be used. Triturate 20 to 25 cc. of blood with 35 to 52 Gm. of anhydrous sodium sulfate to take up the water and then extract with ether. Filter the ether solution through a 0.2-Gm. layer of magnesia covered with a 0.2-Gm. layer of activated charcoal. Evaporate to dryness and test the residue for barbiturates. The following test will detect 0.5 mg. of barbital or similar compound in the 25 cc. of blood: to part of the above residue add 0.5 cc. of a 0.3% solution of cobalt nitrate in absolute alcohol, then 0.1 cc. of a 1% solution of diethylamine in absolute alcohol; a violet color indicates a barbiturate.—H. GRIFFON and R. LE BRETON. *Compt. rend. soc. biol.*, 130 (1939), 337-340; through *Chimie & Industrie*, 42 (1939), 450. (A. P.-C.)

Bile Salts—Colorimetric Determination of, in Duodenal Liquid. A comparative study of the method of Scott and of the method of Chabrol, Charonnat, Cottet and Blonde showed that both methods are sufficiently specific for the determination of bile salts in duodenal liquid. The error for both methods does not exceed 7%. The method of Chabrol *et al.* seems preferable because it avoids the use of fuming hydrochloric acid and because it is more sensitive.—L. DUBOIS, G. BARAC and A. LAMBRECHTS. *Bull. soc. chim. biol.*, 20 (1938), 1282-1284; through *Chimie & Industrie*, 42 (1939), 32. (A. P.-C.)

Blood for Transfusions—Condensation Products for Preserving. By the condensation of an alicyclic acid such as 1,2,2-trimethyl-*cis*-cyclopentane-1,3-dicarboxylic acid with a tertiary aliphatic amine such as hexamethylenetetramine and an aliphatic polyoxy acid such as gluconic, galactonic, talonic, glycuronic, saccharic, mannonic, gluonic or idonic acid (suitably by heating together in acetone or methyl ethyl ketone with refluxing or under pressure), white crystalline products suitable for preserving blood are produced.—ROGER FISCHER. U. S. pat. 2,194,468, March 26, 1940. (A. P.-C.)

Blood Levulose—New Method of Determining. Comparative studies using the Sthor method and the Corley colorimetric method showed the former to be more accurate, particularly for amounts of levulose between 0.1 and 0.5 Gm. per liter, while for minimal amounts (0.02 to 0.04 Gm. per liter) the Corley method is superior.—R. LOCASCIO and

E. CLAAR. *Diagn. Tecnica Labor*, 9 (1938), 737-745; through *Chimie & Industrie*, 42 (1939), 34.

(A. P.-C.)

Blood Serum—Spectroscopic Determination of Calcium, Potassium, Sodium and Magnesium in Small Amounts of. This is an application of Lunde-gardh's method to the analysis of small quantities of blood serum. The spectrum of the element to be determined, produced by an acetylene flame, is photographed after having photographed the spectrums of a series of standard solutions; the degree of blackening of the lines, relatively to the background, is then measured by means of a thermoelectric photometer. The curve produced from measurements with standard solutions permits of reading directly the proportion of the element in question present in the serum.—E. NORINDER. *Biochem. Z.*, 299 (1938), 168-173; through *Chimie & Industrie*, 41 (1939), 1076.

(A. P.-C.)

Calcium—Microchemical Determination of, in Serum and in Serum Ultrafiltrates. The calcium is precipitated as oxalate in 5 cc. of the sample. It is removed by a microfilter stick and the washed precipitate is titrated with potassium permanganate in the presence of acid. Various devices are described which facilitate the work. These consist of special forms of a pipet or buret without stopcock, a rotatable hot plate, suitable wash bottle and reservoir. The method is suitable for clinical work. Results on the determination of about 0.012% calcium agree to within about 0.0002%.—K. SCHOLTIS. *Mikrochemie (Mikrochim. Acta)*, 26 (1939), 150-157; through *Chimie & Industrie*, 42 (1939), 794.

(A. P.-C.)

Chloralose—Detection of, in Urine. The identification of chloralose in the urine after ingestion of a moderate dose of the compound may be effected by the following method which can also be used to distinguish between chloralose poisoning and barbiturate coma. To 20 cc. of urine add 1 cc. of sulfuric acid and about 0.5 Gm. of decolorizing agent (Norit Poulenc, etc.), then heat to boiling and boil for five to ten minutes in a flask fitted with a reflux condenser. Cool, filter, transfer to a tube containing 2-3 cc. of colorless pyridine and a volume of sodium hydroxide solution equal to the reaction mixture. Mix well and heat on a boiling water bath for one to two minutes. If chloralose is present, the supernatant pyridine layer is colored rose to cherry red according to the concentration of the compound in the sample. The reaction is positive with 0.1 Gm. of chloralose per liter of urine. The reaction is positive when chloral, chloroform, bromoform or iodoform is present. But although the latter substances may give misleading results, in poison cases the test will indicate the nature of the ingested hypnotic and suggest the appropriate treatment.—P. CHERAMY. *J. pharm. chim.*, 1 (1940), 233-234. (S. W. G.)

Chlorophyll—Photodynamic Hemolysis of. The photodynamic hemolysis of an impure extract of chlorophyll is more accentuated than that of a pure pigment prepared by the author with a special method described and is probably due to its lipid content which strengthens the activity of the pure pigment.—B. BRUNO. *Biochim. terap. sper.*, 26 (1939), 100.

(A. C. DeD.)

Cysteine or Cyanide—Action of, upon Gonadotropic Extracts. The pituitary and urinary (prolan) gonadotropic hormones are relatively stable to cysteine and cyanide under experimental conditions which produce inactivation of insulin, and lead to disulfide reduction. Prolonged action (24 hours) and a large excess (10-fold by weight) of cyanide produce partial inactivation of both hormones, and within the error of assay, to the same degree. Prolonged action (48 hours) and a large excess (10-

fold by weight) of cysteine hydrochloride produce more than 90% inactivation of the pituitary preparation under experimental conditions which produce 65-85% inactivation of prolan. These results are not in accordance with the view that the disulfide linkage is a component of the active group in the pituitary hormone but not in the urinary hormone.—FRITZ BISCHOFF. *J. Biol. Chem.*, 134 (1940), 641.

(F. J. S.)

Diffusing Factors—Studies on. IV. The Mode of Action of Diffusing Factors. The mode of action of diffusing factors is discussed and a possible theoretical explanation is advanced.—M. G. EVANS and J. MADINAVEITIA. *Biochem. J.*, 34 (1940), 613. **V. Separation of the Diffusing Factor from the Proteolytic Enzymes Present in Culture Filtrates of Clostridium Welchii.** Various methods are described whereby the proteases present in *Clostridium welchii* filtrates can be separated from the diffusing factor.—J. MADINAVEITIA. *Ibid.*, 621. **VI. The Action of Testicular Extracts on the Viscosity of Vitreous Humor Preparations.** A viscosimetric method is described whereby testicular mucinase may be estimated with an error considerably less than 5%. In the preliminary concentration of the enzyme from the testicle powder mucinase activity seems to run roughly parallel with diffusing activity. No definite evidence has been obtained that the mucinase and diffusing factor are identical.—J. MADINAVEITIA and T. H. H. QUIBELL. *Ibid.*, 625.

(F. J. S.)

α -Dihydrotheelin—Isolation of, from Human Pregnancy Urine. The authors' work is summarized as follows: (1) A method has been devised by which the ketonic estrogen, theelin, reacts quantitatively with the ketone reagent, carboxymethoxylamine. The resulting methoxime (which has been characterized) is soluble in aqueous bicarbonate and can thus be quantitatively separated from an ether solution of non-ketonic estrogens. (2) Theelol monobenzoate has been prepared and characterized; it reacts with lead tetraacetate in the usual fashion of 1,2-glycols. (3) The method of Wintersteiner *et al.* for the precipitation of α -dihydrotheelin with digitonin and the decomposition of the resulting digitonide has been adapted for work with micro quantities. (4) α -Dihydrotheelin has been isolated from human pregnancy urine collected during spontaneous labor and delivery; the α -dihydrotheelin was isolated as the di- α -naphthoate and characterized as such by the melting point, by the mixed melting point with authentic α -dihydrotheelin di- α -naphthoate, and by microcombustion analysis.—MAX N. HUFFMAN, D. W. MACCORQUODALE, SIDNEY A. THAYER, EDWARD A. DOISY, G. V. SMITH and O. W. SMITH. *J. Biol. Chem.*, 134 (1940), 591.

(F. J. S.)

Diiodotyrosine—Note on the Conversion of, into Thyroxin. The conversion of diiodotyrosine into thyroxin *in vitro* has been confirmed, with a completely synthetic diiodotyrosine as starting material.—PAUL BLOCK, JR. *J. Biol. Chem.*, 135 (1940), 51.

(F. J. S.)

Elimination Maximum—Influence of Structure on the. I. The Structure of Vitamin A. A comparison of the elimination curves of lauric, myristic, palmitic and stearic acids has confirmed the postulate that one CH₂ group raises the elimination maximum 5°. A comparison of the elimination curves of oleic, linoleic and stearic acids shows that each non-conjugated double bond lowers the maximum 2°. However, when the double bonds are conjugated, each additional double bond raises the maximum 3°, as shown by a comparison of the curves of stearic, 9,11-linoleic and α -eleostearic acids. The authors' observations are in accord with the view that vitamin A₂ contains the same number of carbon

atoms as vitamin A but differs in that it has one additional conjugated double bond.—E. LEB. GRAY and JOHN D. CAWLEY. *J. Biol. Chem.*, 134 (1940), 397. (F. J. S.)

Estrogenic Hormones—Behavior of, under the Effect of Fermenting Yeast. Fermenting yeast can hydrogenate the carbonyl group (in 17-position) of estrone acetate with formation of α -estradiol. Reduction is accompanied by complete saponification of the acetyl ester. The normal butyrate and the propionate of estrone behave in the same way.—L. MAMOLI. *Ber. deut. chem. Ges.*, 71 (1938), 2696–2698; through *Chimie & Industrie*, 42 (1939), 679–680. (A. P.-C.)

Estrogenic Substances—Obtaining. Fetal fluid of urine of stallions, pregnant mares or pregnant women is digested with a proteolytic enzyme, such as pepsin or trypsin, and the estrogenic substance is extracted from the digested material with an organic, water-immiscible solvent such as ethylene dichloride.—CARL W. EOEERLEIN, assignor to E. R. SQUIBB & SONS. U. S. pat. 2,196,295, April 9, 1940. (A. P.-C.)

Estrone into α -Estradiol—Phytochemical Hydrogenation of. Mamoli has shown that estrone acetate can be converted in the presence of fermenting yeast into α -estradiol. By suitable choice of conditions estrone can be reduced phytochemically without difficulty to α -estradiol. After 7 days of fermentation a yield of about 70% of α -estradiol was obtained.—A. WETTSTEIN. *Helv. Chim. Acta.*, 22 (1939), 250–252; through *Chimie & Industrie*, 42 (1939), 518. (A. P.-C.)

Fibrinogen—Determining, in Plasma. The method is the same as that of Foster and Whipple, except that citrated blood is used in place of oxalated; this makes it unnecessary to ash the fibrin, determine calcium in the ash and correct the weight of fibrin for the precipitated calcium oxalate.—L. A. CHIODIN and F. HUG. *Compt. rend. soc. biol.*, 129 (1938), 1211–1213; through *Chimie & Industrie*, 42 (1939), 33. (A. P.-C.)

Glutamic Acid—Racemization of, with Heat. A convenient procedure for the racemization of *l*(+)-glutamic acid is described. It involves the formation and racemization of pyrrolidonecarboxylic acid with heat, with subsequent hydrolysis of the *dl*-pyrrolidonecarboxylic acid to give *dl*-glutamic acid.—L. EARLE ARNOW and JEANETTE C. OPSAHL. *J. Biol. Chem.*, 134 (1940), 649. (F. J. S.)

Glycerin and the Diabetic. Efforts have been made to find other "substitute carbohydrates," which the diabetic could consume and be better able to tolerate. Products such as levulose, galactose and sorbitol, which are chemically related to glucose, were found to cause a smaller increase in blood sugar than the equivalent amount of glucose would create. In addition, they possess the added attraction of having a sweet taste, and can therefore be utilized in certain manufacturing processes. Modern research has confirmed the fact that non-nitrogenous substances such as glycerin can be converted in the human system into glucose, and, for safety, it should be regarded by patients on carbohydrate-controlled diets that an ounce of glycerin has the same ultimate effect as an ounce of sugar.—R. N. WRIGHT. *Pharm. J.*, 144 (1940), 172. (W. B. B.)

Hemoglobin and Other Chemical Constituents of the Blood of Cattle—Effect of Atmospheric Temperature on. The difficulty of raising (in the Philippines) pure bred cattle imported from temperate countries is thought to be due to changes in the blood brought about by high temperature and relative humidity which greatly retards radiation of heat from the body.—MIGUEL MANRESA, N. C. REYES,

FRANCISCO GOMEZ, LORENZO P. ZIALCITA and PRUDENCIO R. FALCON. *Philippine Agric.*, 28 (1939), 79; through *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 166. (P. A. F.)

Hemolysis—Effects of Heavy Metal Salts on. All the salts studied (ferrous sulfate, ferric chloride, stannous and stannic chlorides, cupric nitrate, sulfate and chloride, lead nitrate and acetate, zinc sulfate, chloride and acetate) affect hemolysis, but at different concentrations. The valence of the metal is of importance as, for a given metal, lower valence produces higher hemolytic power. Zinc salts have the highest hemolytic power and the best antiseptic properties. The nature of the anion is of less importance than that of the cation, from the standpoint of hemolytic power.—I. A. SMORODINTSEV and M. KOPELOEVICH. *Miasnaya Ind. S. S. S. R.*, 9 (1938), No. 12, 28–30; through *Chimie & Industrie*, 42 (1939), 710. (A. P.-C.)

Human Blood—Studies on the Preservation of. Blood is better preserved by the addition of dextrose (modified Rous-Tourner) or of dextrin (Waizels and Whittaker) to preservatives than by plain citrate or the Moscow Institute of Hematology methods. Blood preserved for more than three days should not be used in the transfusion treatment of acute and chronic infections, the anemias and hemorrhagic states, although apparently satisfactory for the treatment of acute hemorrhage and surgical shock.—J. A. KOLMER and M. HOWARD. *Am. J. Med. Sci.*, 200 (1940), 311–321. (B. H.)

Imidazoles, More Particularly Histidine—Microdetermination of, in Blood Serum. A modification of Barac's method (*Compt. rend. soc. biol.*, 124 (1937), 266–269) is described which avoids interference by phenols. No phenols were detected in normal human blood. Histidine is the most abundant imidazole.—A. SCHWARTZ, A. RIEGERT and MARGUERITE BRICKA. *Ibid.*, 129 (1938), 1159–1162; through *Chimie & Industrie*, 41 (1939), 1076. (A. P.-C.)

Inorganic Poisons—Detection of, in Biological Materials without Destruction of Organic Matter. Fats and proteins are hydrolyzed by treatment with potassium hydroxide solution in presence of glycerol until the biuret reaction is obtained. The solution is filtered and arsenic is detected in the filtrate by the usual tests. The residue on the filter is treated with hydrochloric acid, hydrogen peroxide is added, chlorine is removed by boiling, and after filtration the filtrate is tested for mercury.—A. P. SEMENTSOV and YA. Z. LEMBERSKII. *Farm. Zhur.*, 12 (1939), No. 1, 14–19; through *Chimie & Industrie*, 42 (1939), 962. (A. P.-C.)

Iodine Determinations—Permanganate Acid Ashing Micromethod for. A method is described for the determination of iodine in blood. The blood is ashed with permanganate and sulfuric acid and the iodine is distilled from the digest after reduction with oxalic acid. The iodine in the distillate is oxidized to iodate by permanganate, the excess permanganate is reduced and the iodate is titrated with thio-sulfate after the addition of potassium iodide. In fifty-nine experiments inorganic and organic iodine was recovered with an average error of 6.5%. The average recovery for all experiments was 95%. The average blood iodine of ten normal male and of ten normal female adults was 3.17%.—D. S. RIGGS and EVELYN B. MAN. *J. Biol. Chem.*, 134 (1940), 193. (F. J. S.)

17-Ketosteroids—Colorimetric Estimation of, and Their Application to Urine Extracts. The following conclusions are given: (1) The Zimmermann method for the colorimetric estimation of sex hormones has been modified, standardized and adapted

to the Evelyn photoelectric colorimeter. (2) Of forty-one pure compounds examined, fifteen do not give a color. The other twenty-six pure substances give enough color at a 40 γ level to interfere seriously. However, the approximate absorption spectra of these compounds over the 420 to 660m μ range show that acetone, androstenedione, theelin, androsterone, dehydroisandrosterone and urine extracts are very similar in nature with the peak at 520m μ . The other reacting substances give lower color values with the peak at 420m μ . (3) The colorimetric method is of considerable value for testing methods for the recovery of pure androsterone and theelin, for solubility studies and partition coefficients on pure compounds. (4) The results by the colorimetric method on urine extracts are almost always considerably higher than by the capon assay. In only one case was the order strikingly reversed. This was in a eunuchoid treated with very high doses of testosterone propionate.—A. F. HOLTORFF and F. C. KOCH. *J. Biol. Chem.*, 135 (1940), 377.

(F. J. S.)

Lactic Acid—Modification of the Miller-Muntz Method for the Colorimetric Determination of. The method for lactic acid determination described by Miller and Muntz (1938) was modified by introducing the color reagent, *p*-hydroxydiphenyl, in a solution of 0.18M NaOH instead of in the dry form. The average percentage difference (and standard deviation) between duplicate determinations on 0.5 cc. of blood or blood plasma was 3.3 \pm 2.7.—RICHARD H. KOENEMANN. *J. Biol. Chem.*, 135 (1940), 105.

(F. J. S.)

Lead Content of Human Blood. The content of lead in blood has been studied in seventy people with no known industrial exposure to lead; twenty of these were normal healthy persons in the Manchester district, and fifty were hospital patients in the Glasgow area. The range of blood-lead values in this series was 30–89 μ g. per 100 cc., with a mean of 57 μ g. per 100 cc. In 44 lead workers, who had no symptoms of lead poisoning, and who were similarly tested, the blood-lead values were 60–192 μ g. per 100 cc., with a mean of 104 μ g. per 100 cc. There was shown some slight degree of stippling of the erythrocytes in the blood films stained by alkaline methylene blue in 34 of these lead workers. The blood-lead values of normal people, healthy lead workers and patients with lead poisoning are contrasted and discussed. The value of biochemical and hematological investigations in the prevention and diagnosis of plumbism is discussed.—J. N. M. CHALMERS. *Lancet*, 238 (1940), 447.

(W. H. H.)

Luffa Cylindrica (Linn.) Roemer—Crystalline Principle of. From *Luffa cylindrica* (Linn.) Roemer, which is locally known as kabatiti, patolang uak or patolang liqau, the authors isolated a white crystalline dextro-rotatory compound melting at 182–184 $^{\circ}$ C., which is insoluble in water, in diluted and concentrated hydrochloric acid, and in diluted and concentrated sodium hydroxide, slightly soluble in ether, and soluble in ethyl alcohol, methanol, benzene, chloroform, carbon tetrachloride and acetone. It gives the color reaction for phytosterols with several reagents, but, unlike the phytosterols, it does not react with digitonin. Although the elementary analysis and molecular weight determination confirm the formula C₃₀H₄₈O₈, which was first put up by Ramos (*Phil. Pharm. Assoc.*, 14 (1932), 419–447), the derivatives prepared corresponded to one-half of the formula only, which might be due to dissociation because of the prolonged heating involved in the preparation. The presence of the hydroxyl group is shown by the formation of an acetate, C₁₅H₂₃O₃OCOCH₃, from acetic anhydride and from acetyl chloride, and a benzoate, C₁₅H₂₃O₃COC₆H₅, from benzoyl chloride. The forma-

tion of a hydrazone, C₁₅H₂₄O₃NNH₂, and a semicarbazone, C₁₅H₂₄O₃NNHCONH₂, proved the presence of carbonyl group. The formula of the crystalline principle may therefore be expanded for the time being to C₂₈H₃₆O₄(OH)₂(CO)₂. Oxidation of the crystalline compound with potassium permanganate in acetone solution led to the formation of a compound of the formula C₂₁H₃₆O₄. The toxic action and effects of the crystalline compound on frogs and cats were determined. The minimum fatal dose was found to be 0.0014 mg. per Gm. body weight in frogs and about 8 mg. per Kg. body weight in cats. Noisy and difficult breathing, vomiting and frothing of the mouth, petechial hemorrhages in the lungs and the liver were found to be the characteristic symptoms and effects.—MARITN A. DE LA TORRE and ALFREDO C. SANTOS. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 164.

(P. A. F.)

Nicotinic Acid—Determination of, in Biological Materials by Means of Photoelectric Colorimetry. Nicotinic acid reacts with cyanogen bromide to give a yellow color, the intensity of which is increased 3- to 5-fold by the addition of aniline. The ratio of maximal photometric density, measured by the Evelyn photoelectric colorimeter, to the quantity of the acid (from 3 to 50 mg.) is a constant. With application of the proper correction factor as little as 1 microgram of nicotinic acid may be determined. The reagents, when properly stored, are suitable for use for a period of at least five months. The chemical reaction has been used in the analyses of yeast, liver, rice polish and wheat germ preparations and of urine, milk, saliva, plasma and whole blood. The test material is subjected to direct acid hydrolysis, followed by preferential charcoal adsorption for the decolorization of the solution with no concomitant loss of nicotinic acid. A new procedure is described for the estimation of the photometric density due solely to the reaction between nicotinic acid and reagents and for the conversion of this value into absolute units of the acid. The necessity for using acid in preference to alkaline hydrolysis is indicated. Oxidation prior to hydrolysis does not appear to be essential.—DANIEL MELNICK and HENRY FIELD, JR. *J. Biol. Chem.*, 134 (1940), 1.

(F. J. S.)

Nitrogen in Blood—Microdetermination of Total Soluble-, Urea- and Amino-. Blood (0.1 cc.) is absorbed and dried on filter paper which is extracted successively with alcohol-ether mixture and with phosphomolybdic reagent. The two extracts and the residue are then digested separately with sulfuric acid by the Kjeldahl method (using copper sulfate as catalyst). The digests are made alkaline, distilled in the Parnas-Wagner apparatus and the distillates are collected in standard sulfuric acid-potassium iodate reagent, which is subsequently treated with potassium iodide and titrated with two hundredth-normal sodium thiosulfate.—S. BAGLIONI. *Atti accad. Lincei*, 27 (1938), 429–433; through *Chimie & Industrie*, 42 (1939), 30–31.

(A. P.-C.)

Non-Hemin Iron—Improved Method for the Determination of. When tissue is heated for seven minutes at 100 $^{\circ}$ with sodium pyrophosphate and trichloroacetic acid, all of the non-hemin iron is extracted. The method has been tested in a number of cases by comparison with several others. It gives values for non-hemin iron which check very closely with those obtained by indirect determination of this fraction.—GERHARD BRÜCKMANN and SAMUEL GEORG ZONDEK. *J. Biol. Chem.*, 135 (1940), 23.

(F. J. S.)

Nonprotein Nitrogenous Constituents of Blood—Action of Permutite on the, in Aqueous Solution and in the Presence of Trichloroacetic Acid. From

dilute aqueous solution permutite removes ornithine, lysine, arginine and histidine almost completely but adsorbs only small fractions (1% to 15%) of the other non-protein nitrogen compounds of blood. In Moog filtrate (1 volume of serum plus 1 volume of 20% trichloroacetic acid solution) adsorption of the latter group is almost negligible and the removal of the diamino acids is only 52% to 76% complete.—P. CRISTOL and J. FOURCADE. *Compt. rend. soc. biol.*, 131 (1939), 414-415; through *Chimie & Industrie*, 42 (1939), 794. (A. P.-C.)

Organic acids—Titration of the, of Blood Serum. Serum ultrafiltrate is titrated with twentieth-normal hydrochloric acid in a special apparatus containing a hydrogen electrode and the p_H is noted after each 0.05 cc. addition of acid. The curves obtained by plotting the p_H from 8 to 2 against the volume of acid added show numerous inflections which are different in normal and various pathological serums. The method may be clinically useful.—F. GALLAIS. *Bull. soc. chim. biol.*, 21 (1939), 483-488; through *Chimie & Industrie*, 42 (1939), 795. (A. P.-C.)

Pantothenic Acid—Assay Method for. A biological assay method for determining the pantothenic acid content of tissue extracts is described which is rapid, accurate and specific. This method, a modification of that used by Snell *et al.*, for the determination of pantothenic acid and riboflavin, involves the response of *Lactobacillus casei* ϵ to pantothenic acid and has been applied successfully to extracts of yeast, liver, milk, oysters, mushrooms, to urine and to chick tissues. Evidence as to its specificity in addition to that previously published is based upon the fact that different dosage levels yield results which are in agreement and the agent assayed is destroyed under conditions which destroy pantothenic acid. Pantothenic acid (concentrates) added to tissue extracts is "recovered" quantitatively in the test.—DERROL PENNINGTON, ESMOND E. SNELL and ROGER J. WILLIAMS. *J. Biol. Chem.*, 135 (1940), 213. (F. J. S.)

Peptones—Comparative Study of, by the Trypan Blue Reaction. The trypan blue reaction as developed by Menkin (intradermal injection of 0.2 cc. of the material followed by the intravenous injection of trypan blue, permeability being indicated by the spread of the dye round the site of injection) was applied by the authors to various peptones. Large variation was observed between different brands of peptone and a small variation between different batches of the same brand. Possible application of the reaction to clinical efficiency and peptone factor can be obtained in a condition relatively free from the main inert constituents. This concentrated fraction could be used either as a standard of reference for peptone assay or for clinical trial.—G. E. SHAW and H. G. HIND. *Chemist and Druggist*, 132 (1940), 435. (A. C. DeD.)

***o*-Phenanthroline—Determination of Serum Iron and Pseudohemoglobin Iron with.** A method for the measurement of the total iron in serum or plasma, or of the pseudohemoglobin iron of the whole blood, is described. It involves incubation with dilute hydrochloric acid, reduction of the iron to ferrous state with hydrazine, and the measurement in a photoelectric colorimeter of the ferrous complex of *o*-phenanthroline.—GEORGE BARKAN and BURNHAM S. WALKER. *J. Biol. Chem.*, 135 (1940), 37. (F. J. S.)

Phenolic Ketones (Estrone)—Colorimetric Assay of Weakly, in Extracts of Human Urine. A method is given for the determination of the weakly phenolic ketone (estrone) content of the 24-hour urine extracts from patients of various ages. The relative estrone values obtained correspond closely to the physiological status of the individuals studied.—

N. B. TALBOT, J. K. WOLFE, E. A. MACLACHLAN, F. KARUSH and ALLAN M. BUTLER. *J. Biol. Chem.*, 134 (1940), 319. (F. J. S.)

Phosphorus—Determination of, by the Bell-Doisy-Briggs Method. The colorimetric method of Bell and Doisy, as modified by Briggs, for determining phosphorus in biological fluids, is very specific and exact. The influence of 58 different substances thought likely to affect the results was found to be negligible.—G. BARAC. *Bull. soc. chim. biol.*, 21 (1939), 139-142; through *Chimie & Industrie*, 42 (1939), 451. (A. P.-C.)

Phosphorus in Feces—Determination of the Different Forms of. Human feces were dried at 100° C. and the different forms of phosphorus were determined by known methods. The sum of the inorganic, acid-soluble organic and phospholipide phosphorus was about 60% of the total phosphorus. The remaining phosphorus was in a form insoluble in acids but soluble in warm dilute sodium hydroxide and probably was combined with bacterial proteins.—G. BARAC and L. BRULL. *Bull. soc. chim. biol.*, 21 (1939), 134-138; through *Chimie & Industrie*, 42 (1939), 451. (A. P.-C.)

Platelet Count and Arakawa's Reaction—Effect of Vitamin B₁ on the. Abnormally high blood platelet count seen in mothers secreting milk negative to Arakawa's reaction was restored to the normal value, or decreased at least on an administration of vitamin B. A high blood platelet count is an early sign of B-avitaminosis and mothers secreting milk negative to Arakawa's reaction are in a state of, or on the brink of, B-avitaminosis.—S. KIMURA. *Tōhoku J. Exp. Med.*, 38 (1940), 222. (A. C. DeD.)

Potassium—Partition of, in Stored Blood. In blood stored according to current Medical Research Council specifications the plasma potassium concentration rises rapidly during the first week to five to ten times the initial level; thereafter the rise is comparatively slow. The source of this potassium is the red cell, from which it is liberated quite independently of hemolysis. At room temperature the plasma potassium concentration rises much less rapidly, reaching only 44 ± 7 mg. per 100 cc. in six days. Reduction of the volume of diluent, absence of foreign salts, increase of oxygen tension or storage at 38° C. did not reduce the rate of redistribution of the ion.—C. B. B. DOWNMAN, J. O. OLIVER and I. M. YOUNG. *Brit. Med. J.*, 4135 (1940), 559. (W. H. H.)

Potassium—Photoelectric Method for the Microdetermination of, in Blood Plasma by the Chloroplatinate Precipitation. A procedure is presented which adapts the chloroplatinic acid precipitation method for potassium to 0.3-cc. samples of plasma, the final reading being based upon the photoelectric determination of potassium iodoplatinate with a correction made from known standards carried through the procedure with the unknown solution. The method has been used in the study of blood preservation; it is also adaptable to other biological materials and has been used in following the potassium balance in certain patients.—ROBERT MAYO TENERY and CARL E. ANDERSON. *J. Biol. Chem.*, 135 (1940), 659. (F. J. S.)

Potassium—Practical Method for the Determination of, in Feces. Rat feces are boiled with 10 to 20 parts of water to make a homogeneous paste, made alkaline with ammonia and again boiled, cooled and diluted with water and alcohol until 100 cc. is equivalent to 4 Gm. of feces and the mixture contains 40% to 50% of alcohol. The mixture is centrifuged and potassium determined in the ash from an aliquot portion of the solution.—A. D. MARENZI. *Anales farm. bioquím. (Buenos Aires)*,

9 (1938), 51-54; through *Chimie & Industrie*, 42 (1939), 449. (A. P.-C.)

Preserved Blood—Value of the Potassium Determination as a Test of the Deterioration of. The rate of sedimentation of blood which has been rendered incoagulable and preserved in a refrigerator can be predicted from the potassium content of the plasma. The potassium content also indicates when the blood can no longer be used for transfusions.—G. JEANNENEY and L. SERVANTIE. *Compt. rend. soc. biol.*, 129 (1938), 1189-1190; through *Chimie & Industrie*, 42 (1939), 32. (A. P.-C.)

Pyrimidine Component of Vitamin B₁—Photochemistry and Absorption Spectroscopy of the. The absorption spectrum of 2-methyl-5-ethoxymethyl-6-amino-pyrimidine has been found to vary with p_H in the same manner as that of thiamine and is evidently responsible for the behavior of the latter. The photochemical decomposition of the thiamine "pyrimidine" at $\lambda 2537 \text{ \AA}$. has been demonstrated by its loss of selective absorption and its inability to support the growth of *Phycomyces* cultures. The quantum yield for inactivation, when inactivation results from changes in side groups as well as from a breakdown of the ring structure, has been found to be 0.0184.—FRED M. UBER and FRANK VERBRUGGE. *J. Biol. Chem.*, 134 (1940), 273. (F. J. S.)

Riboflavin—Estimation of. I. New Biological Method. Treatment of extracts of liver or yeast with norite charcoal yielded a filtrate which, while deficient in riboflavin, contained all other known constituents of the vitamin B₂ complex. Young rats when given a diet complete in other respects and containing liver charcoal filtrate as a source of B₂ vitamins showed graded growth response to graded doses of riboflavin. A method is therefore suggested whereby the riboflavin contained in foodstuffs may be determined by employing one of these filtrates as the riboflavin-free supplement to the diet.—M. M. EL SADR, T. F. MACRAE and C. E. WORK. *Biochem. J.*, 34 (1940), 601. **II. Estimation of Riboflavin in Milk.** Comparison of the Fluorimetric and Biological Tests. The biological method of assay of riboflavin (above) has been compared with the fluorimetric tests for full cream spray-dried milk and for evaporated milk and good agreement was found when the milks were fed at levels supplying up to 10 μ g. daily. For a higher level the agreement was not so satisfactory.—K. M. HENRY, J. HOUSTON and S. K. KON. *Ibid.*, 607. **III. Statistical Analysis of the Data.** Since significantly different slopes for the standard curve may occur in different laboratories, this emphasizes the necessity of using at least two doses of standard and two doses of the unknown preparation in routine testing.—J. O. IRWIN. *Ibid.*, 610. (F. J. S.)

Sarcosine—Biological Demethylation of, to Glycine. Adult male rats of constant weight were kept on a casein-containing stock diet to which an amount of sarcosine corresponding to 23 mg. of nitrogen per day was added. The nitrogen of the sarcosine contained 4.50 atom per cent N¹⁵ excess. The experiments were carried out for three and six days. At the end of the feeding period the animals were killed and a number of amino acids were isolated from the proteins and their isotope content determined. The results were compared with analogous experiments in which isotope glycine instead of sarcosine was added. The results of the two experiments (sarcosine and glycine) were almost identical. The isotope concentration in the glycine from the proteins was high, while that of the other amino acids was much lower. The results indicate that sarcosine is directly demethylated to form glycine without deamination. The demethylation

process is very rapid and must have occurred during or immediately after absorption.—KONRAD BLOCH and RUDOLF SCHOENHEIMER. *J. Biol. Chem.*, 135 (1940), 99. (F. J. S.)

Serine—Synthesis of. An economical method of preparing serine from simple materials has been presented. Bromine was added to ethyl acrylate and the ethyl α, β -dibromopropionate was converted to ethyl α -bromo- β -ethoxypropionate by the action of sodium ethylate. This product was then converted to serine by saponification, amination and hydrolysis. An overall yield of 47% of the theoretical amount was obtained.—JOHN L. WOOD and VINCENT DU VIGNEAUD. *J. Biol. Chem.*, 134 (1940), 413. (F. J. S.)

Sex Hormones. IV. A new method is described for the preparation of pregnenolone. Dehydroandrosterone is oxidized into androstenedione, which is converted into its 3-enolic ethyl ether; acetylene is fixed on its 17-keto group, and the enolic ether is hydrolyzed by treatment with acid.—H. H. INHOFFEN and H. KOSTER. *Ber. deut. chem. Ges.*, 72 (1939), 595-596; through *Chimie & Industrie*, 42 (1939), 855. (A. P.-C.)

Sexual Hormones. A process of producing hormone-like substances having the activity of a male sexual hormone as well as of a corpus luteum hormone involves treating a mixture containing cholestenone with an oxidizing agent which may be a metal-oxygen compound such as chromic acid, a compound of tetravalent lead, or an acid derived from hydrogen peroxide.—WILHELM DIRSCHERL and FRITZ HANUSCH, assignors to RARE CHEMICALS, INC. U. S. pat. 2,197,853, April 23, 1940. (A. P.-C.)

Spleen—Platelet-Reducing Extracts of the. The acetone extract of a thrombocytopenic spleen reduced the platelets of a rabbit more powerfully than an acetone extract of a normal spleen. A Ringer extract of normal spleen was more effective in reducing platelets than the acetone extract of normal spleen, and it appears desirable to determine the optimum conditions for extracting platelet-lowering substance from normal spleen before comparing the conditions in health and disease.—F. C. G. HOBSON and L. J. WITTS. *Brit. Med. J.*, 4123 (1940), 50. (W. H. H.)

Sterols—Determination of. Rappaport and Klapholz's micromethod (based on the hydrolysis of excess of free digitonin after precipitation of the cholesterol, in presence of sulfuric acid, and determination of the glucose formed by Fujita and Iwatake's method) gives an accuracy of -3.5% to +5.0% for amounts of sterols lying between 0.025 and 0.075 mg. For smaller amounts the results are not so accurate. The following conditions should be observed: the solution should be carefully neutralized after hydrolysis; only freshly prepared digitonin solutions should be used; the ratio of digitonin to sterol should be 10 to 1. Precipitation time may be shortened to 2 hours.—A. A. GRIGORIEVA. *Biokhimiya*, 3 (1938), 654-662; through *Chimie & Industrie*, 42 (1939), 680. (A. P.-C.)

Thallium Chloride—Microchemical Detection of, in Urine. Evaporate 1500 cc. of urine to dryness dissolve the residue in a little hot water acidified with 20% nitric acid; filter repeatedly until a clear, light yellow filtrate is obtained; cool and treat the filtrate with a few drops of concentrated hydrochloric acid; centrifuge, decant the liquid and examine the crystals obtained under the microscope. Morphologically thallium chloride crystals are characterized by their Latin-cross shape, the longest arm of which has marginal fringes of variable depth; in small quantity they occur as small cubes, grouped or isolated, of variable size. The test is qualitative,

but the important point is to be able to prove the presence or absence of the poison in the system during elimination in order to judge of the effects of elimination treatment. It was detected in the urine 50 days after its ingestion.—L. BATTISTONI. *Arch. Farmacol. sper.*, 67 (1939), 22-26; through *Chimie & Industrie*, 42 (1939), 249. (A. P.-C.)

Thrombocytes of Lactating Mothers Taking Vitamin B. The relationship between the blood platelet count and Arakawa-negative mothers taking a vitamin B preparation is shown. There is a certain parallelism between the blood platelet count of lactating mothers and the intensity of their Arakawa's reaction—the weaker the Arakawa's reaction, the higher the blood platelet count is. In the group of cases with negative Arakawa's reaction, the average count is always smaller in the cases with vitamin B intake than in those without it. But in the group of cases with positive Arakawa's reaction the average count is about the same in the cases without vitamin B intake as in the cases with it.—S. KIMURA. *Tôhoku J. Exp. Med.*, 38 (1940), 210. (A. C. DeD.)

Thyrotropic Hormone of the Anterior Pituitary—Purification of. Five methods of assay of thyrotropic hormone have been correlated with the test based on the gain in weight of chick thyroids. Details of the chick test have been discussed and a unit is defined. A method of preparation and purification of the thyrotropic factor of the anterior pituitary has been described in detail. The final product represents a hundredfold purification with recovery of about one-third of the total thyrotropic activity of the starting material. Some of the properties of the active protein have been reported. The degree of contamination of this protein with other pituitary hormones has been investigated. It was found to contain about 10% of the interstitial cell-stimulating hormone but very little lactogenic, adrenocorticotrophic, growth-stimulating or follicle-stimulating hormones.—JANE FRAENKEL-CONRAT, HEINZ FRAENKEL-CONRAT, MIRIAM E. SIMPSON and HERBERT M. EVANS. *J. Biol. Chem.*, 135 (1940), 199. (F. J. S.)

Tocopherol—Potentiometric Estimation of. The errors due to the interference of carotenoids and similar substances in the potentiometric estimation of tocopherol with gold chloride can be eliminated by titration of the unsaponifiable, alkali-insoluble, petroleum ether-soluble portion of the test sample before and after acetylation, since acetylation converts tocopherol into the non-reducing acetate but does not affect the reducing power of the carotenoids. The difference of the 2 values is thus the measure of the tocopherol content. Experimental details for the estimation of tocopherol in an artificially prepared mixture of 0.94 mg. of β -carotene and 4.15 mg. of racemic α -tocopherol are given in which a content of 4.08 mg. of tocopherol was determined. Details are also given of experiments showing that tocopherol can be determined in the presence of vitamin A by pretreatment with antimony trichloride in chloroform to destroy the vitamin A. An alcohol solution containing 0.825 mg. of tocopherol per cc. was irradiated for 3 hours and lost all its reducing power toward gold chloride. In the absence of air the loss was 48% in 2 hours on irradiation in a quartz container.—P. KARRER and H. KELLER. *Helv. Chim. Acta*, 22 (1939), 158-160; through *Chimie & Industrie*, 42 (1939), 678. (A. P.-C.)

α -Tocopherol (Vitamin E)—Colorimetric Determination of. The method is based on the reducing properties of tocopherol toward ferric chloride. The ferrous salt produced by the reaction is determined colorimetrically with α, α' -dipyridyl or with *o*-phenanthroline.—A. EMMERIE and C.

ENGEL. *Rec. Trav. Chim. Pays-Bas*, 57 (1938), 1351-1355; through *Chimie & Industrie*, 42 (1939), 679. (A. P.-C.)

Tryptophan—Photometric Determination of, in Blood Serum. The color reaction is based on the reaction of tryptophan and formaldehyde in the presence of a strong acid and a mild oxidizing agent.—E. POLI. *Diagn. Tecnica Labor*, 10 (1939), 260-263; through *Chimie & Industrie*, 42 (1939), 636. (A. P.-C.)

Tungsten—Determination of, in Biological Materials. A method for the determination of tungsten in biological materials is described. The range of recoveries is from 95% to 105.8%, with an average recovery for the series of 99.9%.—J. C. AULL and FREDERICK W. KINARD. *J. Biol. Chem.*, 135 (1940), 119. (F. J. S.)

Uric Acid—Determination of, in Urine and Blood by the Phosphotungstic Acid Method and the New Chromometric Method. The name "volumocolorimetric" is given to determinations wherein a color is developed as in the usual colorimetric methods but, instead of using a colorimeter, the solution is then titrated with an appropriate reagent until the color is discharged. Thus, in the determinations of uric acid in urine or in blood filtrate the blue color is developed with phosphotungstic reagent in the known manner, then the mixture is titrated with alkaline potassium ferricyanide reagent (2 Gm. of potassium hydroxide and 2 Gm. of potassium ferricyanide in 100 cc. of water) until the blue color just disappears. The reagent is standardized with pure acid. In another method, termed "chromometric," the uric acid is precipitated from 5 cc. of urine with Salkowski's alkaline silver-magnesium reagent, the washed precipitate is dissolved in 5 cc. of warm 50% sulfuric acid, the solution diluted to 10 cc. and a 2 cc. aliquot titrated at 100° C. with twentieth-normal potassium dichromate using leuco-methylene blue as outside indicator. The uric acid is oxidized to carbon dioxide and ammonia. This method is not suitable for urine containing preservatives nor for blood filtrates. Standard solutions of uric acid or urates in water undergo slow oxidation and hydrolysis on standing. Sterilization or the addition of phosphates retards these changes. All the uric acid of urine is free or in the form of simple salts; none of it is conjugated.—A. IONESCO-MATIU and ANA POPESCO. *Bull. soc. chim. biol.*, 21 (1939), 264-274; through *Chimie & Industrie*, 42 (1939), 636. (A. P.-C.)

Urinary Albumin—Errors Due to the Temperature Factor in Esbach's Method of Estimating. Tests made on the same albumin solution showed, after standing 24 hours at 13°, 19° and 25° C., 0.65%, 0.5% and 0.3%, respectively, of albumin. In another experiment identical mixtures of the albumin solution and reagent were heated 15 minutes at 25°, 35° and 45° C., respectively, then allowed to stand 24 hours at 13° C. The final readings were 0.45, 0.26 and 0.14%, respectively.—M. URBAN. *Compt. rend. soc. biol.*, 130 (1939), 918-920; through *Chimie & Industrie*, 42 (1939), 795. (A. P.-C.)

Urine—Application to, of Bandier and Hald's Method for the Determination of Nicotinic Acid. It was found that Bandier and Hald's method is a simple and specific procedure for the chemical determination of nicotinic acid and nicotinamide in urine. With this method the normal urinary excretion of nicotinic acid plus nicotinamide, expressed as mg. of nicotinic acid, is found to vary from 3.4 to 10.2 mg. in 24 hours. Urinary nicotinic acid was low in a patient with pellagra, disappearing altogether as the diet low in the B vitamins was continued. Administration of a diet high in B vitamins and sup-

plementary administration of nicotinic acid caused increases in the nicotinic acid excretion.—LOUIS A. ROSENBLUM and NORMAN JOLLIFFE. *J. Biol. Chem.*, 134 (1940), 137. (F. J. S.)

Uronic Acids—Microestimation of. Free glucuronic or galacturonic acid can be estimated photometrically by a procedure based on Tollens reaction. The method is described for samples containing from 10 to 40% of glucuronic acid, or from 7 to 30% of galacturonic acid. These acids can be distinguished from one another by their different rates of pigment formation with naphthoresorcinol.—ELEANOR M. KAPP. *J. Biol. Chem.*, 134 (1940), 143. (F. J. S.)

Vitamin A and Night Blindness. A review of the clinical manifestations produced by a deficiency, and the mode of action of the vitamin against night blindness.—L. F. STEFFENS. *Am. J. Med. Sci.*, 198 (1939), 292-299. (B. H.)

Vitamin A—Potency of, in Sauga Liver Oil. A biological assay of this fish liver oil by the rat growth method found that it contained 2400 U. S. P. XI vitamin A units in one gram. This compares favorably with several brands of cod liver oil and is four times greater than the minimum U. S. P. XI requirements.—M. GUTIERREZ. *Acta Med. Phil.*, 1 (1939), 47; through *Rev. Filipina Med. Farm.*, 30 (1939), 346. (G. S. G.)

Vitamin A Potency of Sanga (Mobula Eregoodoo-Tenkee) Liver Oil. Using a rat growth method essentially like the U. S. Pharmacopœia XI method for assaying vitamin A in cod liver oils, a sample of "Sanga" (*Mobula eregoodoo-tenkee*) liver oil was assayed and found to contain 2400 U. S. P. XI vitamin A units per gram. The vitamin A potency of the sample assayed compares favorably with that of several brands of medicinal cod liver oils, and exceeds by four times the minimum required by the U. S. Pharmacopœia for cod liver oils. A stock diet for albino rats for use in the biological assay of vitamins is also described.—M. GUTIERREZ. *Acta Med. Phil.*, 1 (1939), 1; *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 128. (P. A. F.)

Vitamin B Administration—Change of Platelets on. In B-avitaminotic infants fed on human milk negative to Arakawa's reaction, an administration of vitamin B makes the increased platelet count smaller and restores the ratio of platelets to normal.—M. SHINDO. *Tôhoku J. Exp. Med.*, 37 (1940), 410. (A. C. DeD.)

Vitamin B Complex—Extraction of, from Yeast. Brewer's yeast or the like, such as "Milbrew" yeast, is extracted with a solvent, such as one containing 90 parts of methanol, 9 parts of water and 1 part of hydrochloric acid, which does not substantially swell the yeast and in which the vitamin complex is soluble (suitably at a temperature not exceeding 60° C.), the extract formed is separated, and gummy constituents are removed from it, as by evaporation and flotation.—BEN MAIZEL, assignor to VICO PRODUCTS Co. U. S. pat. 2,193,876, March 19, 1940. (A. P.-C.)

Vitamin B₁ and Its Preparations—McCollum and Prebluda Test for. After experimental study of some type reactions, the McCollum and Prebluda test was found to be most satisfactory when applied to materials containing Vitamin B₁ hydrochloride, yeast concentrates, some Philippine fruits and vegetables, tikitiki and extract of tikitiki. A quantitative method for assay of the latter was devised (not given).—GLORIA D. MANALO and PATROCINIO VALENZUELA. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 159. (P. A. F.)

Vitamin B₂ Complex. II. Observations on the Nutritive Value of Sugars. Raw sugar concentrates contain at least two factors essential for rat nutrition; a factor which is adsorbed on acid clay from which it can be eluted with fifth-normal barium hydroxide, and which may be identical with vitamin B₂; and another factor which is present in the acid earth filtrate which resembles the so-called "filtrate factor."—U. TANGE and T. KANEKO. *Sci. Papers Inst. Phys. Chem. Research*, 35 (1938), 860-871; through *Chimie & Industrie*, 42 (1939), 855. (A. P.-C.)

Vitamin B₆—Study of the Urinary Excretion of, by a Colorimetric Method. The authors summarize their work as follows: (1) A colorimetric method based on the indophenol reaction has been used to study the excretion of test doses of vitamin B₆ in the normal dog and man. (2) The short interval between oral administration of the vitamin and its appearance in the urine indicates that it is rapidly absorbed from the gastrointestinal tract and readily excreted. (3) After the intravenous administration of the vitamin in doses ranging from 25 to 500 mg., 18% of the vitamin was recovered from the urine of dogs within one hour. After oral administration, these dogs excreted 20% of the vitamin within six hours. (4) In a group of apparently healthy human subjects, an average of 8.7% of a 50 mg. intravenous dose of the vitamin was recovered within one hour, while 7.6% of a 100 mg. oral dose was recovered within four hours.—JOHN V. SCUDI, KLAUS UNNA and WILLIAM ANTROPOL. *J. Biol. Chem.*, 135 (1940), 371. (F. J. S.)

Vitamin C Containing Syrups. Fourteen references are given.—GEORG DULTZ. *Süddeut. Apoth.-Ztg.*, 80 (1940), 87; through *Chem. Abstr.*, 34 (1940), 3878. (F. J. S.)

Vitamin C Content of Normal Filipino Blood. The blood of 98 normal Filipinos of different sexes, ages and occupations was examined for ascorbic acid content of plasma and corpuscles using the Pijoan and Eddy method. The average ascorbic acid content of the plasma was found to be 1.0573 ± 0.0321 mg. per cent and that of the corpuscles to be 0.8911 ± 0.0254 mg. per cent. There was a slight positive correlation between ascorbic acid content of plasma and sex. Though vitamin C in the female is higher than in the male, the difference in the average between them when studied statistically was found to be insignificant. On the other hand the authors found that there was no correlation between age and ascorbic acid content of the plasma. Provided that the blood was not hemolyzed, the plasma ascorbic acid content was as a rule higher than in the corpuscles. Results seemed to agree with those of Hawley, who claimed that a level of ascorbic acid in the blood between 0.1 and 1 mg. per cent in the plasma may be considered sufficient, and a figure below this level may be taken as insufficient or as indicative of a prescorbutic condition.—PEREGRINO PAULINO, JR. *Philippine Isls. Med. Assoc.*, 19 (1939), 337; through *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 89. (P. A. F.)

Vitamin C Determination—New Biochemical Method of. The amount of vitamin C in the organs of guinea pigs varies as the logarithm of the daily dose of ascorbic acid administered. The following equation was deduced to calculate the quantity of ascorbic acid present in a given substance, if the amount of ascorbic acid existing in the organs of the guinea pig after 18 days of dosage is known: $y = 68.44 \log(x + 1) - 4.90$, where x is the daily dose of ascorbic acid administered and y is the amount of ascorbic acid in the organs. Results obtained with such experiments are given graphically.—L. RANDOIN and C. P. LEBLOND. *Compt.*

rend. acad. sci., 208 (1939), 941-943; through *Chimie & Industrie*, 42 (1939), 795. (A. P.-C.)

Vitamin D Product—Preparation of. A dispersed suspension of a proteinaceous material in an aqueous medium, such as lactalbumin separated from milk and redispersed in water, is treated to increase its vitamin D content (as by use of a solution of vitamin D in propylene glycol), and the p_H of the dispersion is adjusted to precipitate the combined vitamin D and proteinaceous material (a p_H of about 5.2 to 4.1 being suitable for this purpose, and a p_H of 6.3 to 7 being suitable for the previous preparation of the vitaminic liquid mixture).—G. C. SUPPLEE, assignor to BORDEN Co. U. S. pat. 2,194,188, March 19, 1940. (A. P.-C.)

Vitamin E Complex—Presence of a Hematopoietic Stimulant in the. Vitamin E possesses hematopoietic properties; thus, wheat germ oil increases both the erythrocyte count and the hemoglobin content of the blood of dogs.—I. PERAGALLO and E. FIORI. *Z. Vitaminforsch.*, 8 (1938-1939), 132-136; through *Chimie & Industrie*, 42 (1939), 680. (A. P.-C.)

Vitamin E—Photometric Determination of. On addition of concentrated nitric acid to tocopherol in absolute alcohol and short heating the colorless to yellow solution becomes orange-red and in a few minutes turns intense cinnabar red. The color is possibly due to the formation of an oxonium salt by the addition of nitric acid to the tocopherolquinone formed by oxidative cleavage. Weigh 1 to 5 mg. of tocopherol into a 25-cc. flask and dissolve in 5 cc. of absolute alcohol and 1 cc. of 65% nitric acid; reflux on the steam bath for 3 minutes; determine the intensity and extinction coefficients of the cooled solution by means of the Pulfrich photometer. Tests on related compounds, concomitant materials in natural products, phenols and phenolic acids, tableting materials and various medicinal oils proved the specificity of the test for natural and synthetic tocopherol, derivatives and natural substances containing tocopherol. The absorption spectrum of the resulting product has a characteristic form with a definite maximum at 467μ . The method is sensitive to 0.05%. Beer's law is followed and the extinction value is proportional to the concentration of tocopherol over a sufficiently wide experimental range. The method can be applied to the measurement of the tocopherol content of oils without previous saponification or concentration. Tests on pure racemic α -tocopherol showed that the experimental error does not exceed tolerated limits. Tables of results on estimations of tocopherol in decomposition products after aging and irradiation and of tocopherol in oils (directly introduced and naturally occurring) are given together with a table of solution with definite tocopherol content and the corresponding extinction coefficients of the reaction product with nitric acid.—M. FURTER and R. E. MEYER. *Helv. Chim. Acta*, 22 (1939), 240-250; through *Chimie & Industrie*, 42 (1939), 678. (A. P.-C.)

Vitamin K Utilizable in Therapeutics—Process for the Manufacture of. Nonalcoholic lipid solvents are used for the elution of the adsorbate, e. g., the same as those used for the adsorption.—PRODUITS ROCHE, Soc. ANON. Belg. pat. 433,936, May 31, 1939. (A. P.-C.)

Vitamin Content of the Germ Oil of Theobroma Cacao L. Experiments with rats and comparison with the action of pure β -carotene showed that cacao germ oil possesses vitamin A activity equal to 825-1400 International Units per 100 Gm.—K. H. WAGNER and L. SEBER. *Bull. officiel office intern. cacao chocolat*, 9 (1939), 147, 149; through *Chem. Abstr.*, 34 (1940), 3880. (F. J. S.)

Vitamin Preparations. Liver or kidney material is subjected to hydrolysis at temperatures above 100°C . (suitably 140° to 250°C . under pressure with dilute hydrochloric or sulfuric acid solution for several hours), and the product (suitably after neutralization) may be treated with an organic solvent such as acetone or isopropanol, etc.—FRITZ SCHULTZ, assignor to WINTHROP CHEMICAL Co. U. S. pat. 2,193,523, March 12, 1940. (A. P.-C.)

Vitaminized Milk. A process for the manufacture of concentrated sweetened milk containing added vitamins involves adding fat-soluble vitamin concentrates in the form of an emulsion to the milk to be concentrated, concentrating the mixture of enriched milk and required quantity of sugar, adding water-soluble vitamins at a stage nearing the end of the concentrating step, and further concentrating the mixture up to the total-solids content usual for concentrated sweetened milk.—BERNARD CUENOD, assignor to SOCIÉTÉ D'ETUDES ET D'APPLICATIONS INDUSTRIELLES. U. S. pat. 2,197,095, April 16, 1940. (A. P.-C.)

Vitamins—Deficiency of, in Average Diets. Deficiency diseases develop more rapidly among people who are addicted to alcohol and among those who suffer from hyperthyroidism than among normal individuals. The hepatic damage which may be present in these two diseases may interfere with the absorption and utilization of the vitamins. It has been said many times that the normal American diet, even in the high income groups, is not overly supplied with vitamins. A fairly large percentage of our population is on a diet which is dangerously close to the borderline for vitamin B₁. Many of our common gastrointestinal ailments have, as complicating features, deficiency states of one type or another. Treatment of the deficiency state is an essential part of any therapeutic program. In the postoperative state, deficiencies of thiamine chloride, nicotinic acid, riboflavin and vitamin K may well develop. Prompt treatment of the vitamin deficiencies is essential for success.—A. M. SNELL. *J. Iowa State Med. Soc.*, 30 (1940), 381; through *Abbott Abstract Service*, (1941), No. 771. (F. J. S.)

Vitamins in Sponges. The authors describe the discovery in the red sponge *Hymeniacidon sanguineum* of two carotenoids, echinenone and γ -carotene. The former was first isolated by Lederer in 1935, but the authors claim that their discovery of the latter constitutes the first occasion where γ -carotene has been isolated from invertebrates. Both substances have vitamin A activity.—DRUMM and O'CONNOR. *Nature*, (March 16, 1939), 425; through *Chemist and Druggist*, 133 (1940), 21. (A. C. DeD.)

Vitamins—Influence of, on the Activity of Yeasts. Addition of vitamins, and more particularly of vitamin containing yeast extracts, increases the alcohol and yeast yields in anaerobic fermentation and increase the yeast yield in aerobic fermentation. Addition of vitamins increases the yield of alcohol from worts fermented in absence of saccharifying diastases; too great an addition of vitamin A decreases this yield. Addition of vitamins produces a greater utilization of nitrogenous matter.—M. RADOMALSCHI. *Fermentatio*, (1939), 33-39. (A. P.-C.)

Yeast—Effect of Bios on the Nitrogen Metabolism of. I. Ammonia and Carbamide. With each of eight cultures of *Saccharomyces cerevisiae* tested, four of Type A and four of Type B, the growth with ammonia and carbamide nitrogen is found to depend upon the bios supplement. Considering the growth on ammonia nitrogen as a reference point, it is found that growth on carbamide nitrogen requires more

Bios IIB but less β -alanine. Growth on mixtures of the two nitrogen sources is described for one strain of *Saccharomyces cerevisiae* Type B. An incompatibility of the two is observed under certain conditions. The effect of bios on nitrogen utilization is believed to indicate a physiological relationship.—ALFRED S. SCHULTZ, LAWRENCE ATKIN and CHARLES N. FREY. *J. Biol. Chem.*, 135 (1940), 267. (F. J. S.)

Zinc, Manganese and Nickel—Hemopoietic Action of. From experiments on experimentally anemiated rats it is concluded that zinc (as sulfate) has hardly any regenerative action on hematids; on the other hand, it increases slightly the hemoglobin content, but this slow and progressive increase is probably due to metallic impurities, especially iron. Manganese and nickel possess no antianemic properties.—M. POLONOVSKI and S. B. BRISKAS. *Compt. rend. soc. biol.*, 129 (1938), 493-496; through *Chimie & Industrie*, 41 (1939), 1139. (A. P.-C.)

ANALYTICAL

Absorption Spectrophotometry. This paper continues the work commenced in Part 1 (*Chemist and Druggist*, July 22, 1939, p. 97) and gives corrected data for diethylstilbestrol and its dipropionate. Figures are given for testosterone and testosterone propionate. The difficulties of dealing with oil solutions are indicated. Figures are given for a range of halibut liver oil samples, with particular reference to spectroscopic criteria of purity. Absorption curves and extinction values have been obtained for a number of alkaloidal and other important drugs, including the cocaine group, solanaceous alkaloids, barbiturates, ephedra alkaloids, morphine and related compounds, emetine, strychnine and plant hormones. The influence of solvents and pH on these have been investigated so that the data may be adopted for analytical purposes. Much of the data obtained has been of a primary nature preparatory to applying it to the examination of drugs and galenicals.—W. F. ELVIDGE. *Chemist and Druggist*, 132 (1940), 434. (A. C. DeD.)

Acetone—Rapid Method of Iodometric Determination of, in Aqueous Solutions. The concentration of acetone in water is determined with an accuracy of $\pm 1.5\%$ by treating 1 cc. of the solution under investigation with 1 cc. of 15% iodine (containing a double amount of potassium iodide) and 1 cc. of 10% potassium hydroxide, and comparing the rate of iodoform precipitation with that of a standard solution similarly treated.—I. K. NIKITINE and M. I. IÉGOROVA. *Zavodskaya Lab.*, 7 (1938), 1363-1367; through *Chimie & Industrie*, 42 (1939), 792. (A. P.-C.)

Aluminum—Determination of, by Photometric Fluorescence. Aluminum may be determined quantitatively by photometric measurement of the intensity of fluorescent solutions produced by the aluminum-morin reaction. Intensity measurements may be made with the Pulfrich or a photoelectric photometer. The amount of morin and alcohol as well as the temperature and pH must be controlled.—C. E. WHITE and C. S. LOWE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 229-231. (E. G. V.)

Aluminum—New Qualitative Test for. Heat a 0.5 to 1 cc. portion of the aluminum solution having a free acid concentration not over quarter- to half-normal hydrochloric to boiling in a test-tube and mix with an equal volume of the reagent (prepared by mixing 10 cc. of a 0.4% zirconium nitrate solution with 5 cc. of 0.4% alcoholic solution of alizarin red and 1 cc. of approximately three-fifths normal potassium fluoride solution and diluting to 65 cc. with twice normal hydrochloric acid); heat the test-tube

contents to the boiling point and cool in a stream of cold water. In the absence of aluminum the solution becomes yellow or golden in color, but in the presence of aluminum the color is crimson. For concentrations of aluminum up to one-hundredth to one-fiftieth normal the intensity of the coloration is proportional to the aluminum content. If the concentration of aluminum is high (half normal) the crimson color appears as soon as the reagent is added and it is not necessary to heat. The sensitivity of the reaction is governed by the fluorine-ion concentration. With the above concentrations of the reagents it is possible to detect as little as 1 part of aluminum in 500,000 parts of solution. In detecting small amounts of aluminum (below one-hundredth normal) the results must be compared with a blank test. The method is convenient, quick and reliable for detecting aluminum in a mixture of cations of the third group after separation from the fourth group. The reaction is interfered with by fluoride, hypochlorite, oxalate and sulfate ions. To remove interfering ions treat the solution with sodium or potassium carbonate and determine aluminum in the precipitate.—V. A. ZAKHARIEVSKI. *Zavodskaya Lab.*, 8 (1939), 33-36; through *Chimie & Industrie*, 42 (1939), 632. (A. P.-C.)

Ammonia—Final Titration of, in the Kjeldahl Microdetermination. Titrating in the cold introduces an error due to carbonate in the alkaline solution and titrating hot gives an incorrect end-point because of hydrolysis of the ammonium sulfate. Titrate to an apparent end-point cold, then heat to boiling to expel carbon dioxide, cool quickly and complete the titration.—M. NICLOUX. *Bull. soc. chim. biol.*, 21 (1939), 483-488; through *Chimie & Industrie*, 42 (1939), 795. (A. P.-C.)

Arsenic—Detection of, by Hypophosphite Reagents. The brown color produced by hypophosphites with arsenious solutions at 20° C. develop more rapidly in the presence of iodide. The sensitivity of the reaction varies with the acidity, quantity of iodide and concentration of hypophosphites used. It is preferable to use calcium salts rather than the solution recommended by the French Codex, which may cause precipitation of chlorides. Optimal conditions are obtained when: volume of official hydrochloric acid $\times 100$ / (volume of water + volume of acid) = 63.7, and 0.5 to 1 Gm. of calcium hypophosphite and 0.5 to 1 Gm. of calcium iodide are used. The following reagent is suggested: 125 Gm. of calcium hypophosphites and 80 Gm. of calcium iodide per liter of official hydrochloric acid. Eight cc. are used for 4 to 5 cc. of arsenious solution. Sulfate and bismuth interfere with the reaction, and selenium and tellurium interfere absolutely.—J. LANGLOIS and CH. MORIN. *Bull. sci. pharmacol.*, 45 (1938), 482-492; through *Chimie & Industrie*, 42 (1939), 450. (A. P.-C.)

Arsenic—Determination of, by the Hypophosphite Method. In the volumetric determination of arsenic by the Evans method by reduction with hypophosphite and copper catalyst, the color sensitivity of the colloidal arsenic solution can be increased by boiling the reaction mixture for 2 to 3 minutes instead of digesting it on a water bath for 30 minutes to 1 hour. By this method 0.02 mg. of arsenic in 10 cc. of solution can be determined colorimetrically with an accuracy equal to that of the nephelometric determination. Arsenic is separated from interfering molybdenum and mercury by precipitating it with ferric chloride and ammonia. Arsenic can be determined in the presence of antimony and tungsten by decomposing the sample with hydrochloric acid and potassium chlorate by the method of Fogel'son and Kalmuikova.—B. S. TSVINA and B. M. DOBKINA. *Zavodskaya*

Lab., 7 (1938), 1116-1120; through *Chimie & Industrie*, 42 (1939), 244. (A. P.-C.)

Ascorbic Acid—Accuracy of the Iodometric Method for Determining, and a Method for the Standardization of Its Preparations. Ascorbic acid can be titrated accurately with iodine in a solution of p_H between 0.7 and 5.0. In a solution of p_H greater than 6 and lower than 9, a negative error of about 2% can be expected by the ordinary method of titration unless it is carried out in a non-oxidizing atmosphere. This error is due to the oxidation of the acid by air during titration. Back titration with sodium thiosulfate makes the determination possible with fair accuracy. The reaction is in accordance with the stoichiometrical equation: $C_6H_8O_6 + I_2 = C_6H_{10}O_6 + 2HI$. Potassium thiocyanate exerts a strong inhibitory effect on the oxidation; it is recommended to add it at a concentration of one four-hundredth molar to ascorbic acid solutions to be titrated.—K. SHINOHARA. *J. Pharm. Soc. Japan*, 58 (1938), 279-292; through *Chimie & Industrie*, 42 (1939), 680. (A. P.-C.)

Barbituric Acids—Photometry of Substituted. Both graphs and other experimental data are presented which show the absorption of fourteen different barbiturates.—P. FRESSENIUS. *Süddeut. Apoth.-Ztg.*, 80 (1940), 112; through *Chem. Abstr.*, 34 (1940), 4525. (F. J. S.)

Barium Carbonate Reagent—Revised Monograph for.—GLENN L. JENKINS. *Bull. Natl. Formulary Committee*, 9 (1941), 99-100. (H. M. B.)

Benzonaphthol—Determining, in Pharmaceutical Preparations. The method consists in saponifying the benzonaphthol by boiling with potassium hydroxide in presence of 96% alcohol, neutralizing the reaction mixture (β -naphtholate + potassium benzoate) with hydrochloric acid, adding a little sodium bicarbonate following by water, and titrating with standard iodine in presence of starch indicator.—D. S. BELENITS'KA. *Farm. Zhur.*, 12 (1939), No. 1, 19-21; through *Chimie & Industrie*, 42 (1939), 1027. (A. P.-C.)

Bile Salts—Composition and Analysis of. The authors describe methods of analysis of sodium tauroglycocholate and sodium glycocholate and give a comprehensive table showing results obtained on analysis of a number of samples from various sources. Discussing their results the authors state that the sulfur content of ox bile preparations is higher than that of salts made from pig bile. This is in accordance with published work. The ratio of taurocholate to glycocholate in sodium tauroglycocholate therefore varies very greatly according to the source of the bile. Of the commercial samples one was probably made from pig bile, the remainder being from ox bile. The specific rotation of the total mixed acids is much lower in the salts prepared from pig bile. This figure is of no value in assessing the purity of samples of unknown origin. The acid values of the total mixed acids are usually rather higher than those of pure cholic acid. The authors recommended that the determination of total mixed acids after hydrolysis should be made and that the acid value and specific rotation of the acids should be determined. The approximate composition of the salts may be calculated from a determination of total sulfur and the total mixed acids. Both sodium tauroglycocholate and sodium glycocholate should contain not less than 70% of total mixed acids after hydrolysis. The acid value of these acids should not be greater than 145. Sodium glycocholate should contain not more than 0.8% of total sulfur.—N. EVERS and W. SMITH. *Chemist and Druggist*, 132 (1940), 434. (A. C. DeD.)

Brandies—Use of Methyl Orange as Indicator for the Determination of the Alkalinity of. Methyl

orange is not suitable for this purpose as its sensitivity is affected by alcohol; for strong alcoholic solutions it indicates too high an alkalinity.—A. ANTONOV. *Spirto-Vodolchn. Prom.*, 16 (1939), No. 1, 39; through *Chimie & Industrie*, 42 (1939), 706. (A. P.-C.)

***p*-Bromobenzamide as a Reagent for the Identification of Alcohols.** The reagent reacts with alcohols in ligroin solutions to give solid urethans with definite melting points. The appearance and melting points of the compounds formed with 27 different alcohols are tabulated.—P. P. T. SAH and K. Y. TAO. *Rec. Trav. Chim. Pays-Bas*, 58 (1939), 12-16; through *Chimie & Industrie*, 42 (1939), 794. (A. P.-C.)

Cadmium—Determination of Small Quantities of, in Air. The principle of the method consists in passing the air through absorbent cotton soaked with decinormal sulfuric acid, and then determining the cadmium colorimetrically by means of a 20% sodium sulfide solution in presence of ammonia.—S. S. GOURVITZ. *Biochem. Z.*, 300 (1939), 113-121; through *Chimie & Industrie*, 42 (1939), 810. (A. P.-C.)

Carbon and Nitrogen—New Semimicromethod for Determining, in Organic Compounds. The method is based on oxidation with manganese dioxide in sulfuric acid. Special apparatus for this purpose is described.—E. SUCHARDA and C. TRYSZKIEWICZOWNA. *Roczniki Chem.*, 18 (1938), 784-797; through *Chimie & Industrie*, 42 (1939), 634. (A. P.-C.)

Carbon Monoxide—New Volumetric Method for the Determination of. A current of air, purified by passing through a train of wash bottles containing lead acetate, sodium hydroxide and sulfuric acid, is drawn through a reaction flask, passed over a similar train and is then drawn through two U-shaped bulb tubes containing a known volume of standard potassium permanganate solution acidified with sulfuric acid and immersed in cooling baths. It is assumed that the carbon monoxide is oxidized to carbon dioxide by the permanganate, and the excess of the latter is determined by adding a measured volume of decinormal oxalic acid to the heated solution and back titrating with decinormal permanganate. The carbon monoxide content of blood and of illuminating gas were determined satisfactorily by this method.—G. VENTUROLI. *Boll. chim.-farm.*, 78 (1939), 1-4; through *Chimie & Industrie*, 42 (1939), 246. (A. P.-C.)

Carbonic Acid—Determination of. The apparatus consists of a 250-cc. wide-mouth decomposition flask connected with an Erlenmeyer flask containing barium hydroxide. The flask is also connected with tubing and a 3-way stopcock by means of which liquid can be added to or taken from the flask. The head of the decomposition flask provides for holding the sample in a small dish from which it can be dumped into the acid as desired. A pressure gage is also connected with the gas-delivery tubing so that the operator can tell when there is no further evolution of carbon dioxide. The sample is decomposed with 3.3*N* sulfuric acid after most of the air has been expelled from the decomposition flask by boiling the acid. The carbon dioxide is absorbed in a measured volume of 0.2*N* barium hydroxide and the carbon dioxide content is determined by titrating the excess barium hydroxide. Cresolphthalein is recommended as the indicator; the end-point is reached before any of the barium carbonate which is precipitated is attacked. The method is very rapid especially with samples of 1 Gm. containing over 40% carbon dioxide.—F. RICHTER. *Z. anal. Chem.*, 119 (1940), 109-118. (S. W. G.)

Cerium—Determination of, and Separation of Thorium and Cerium by Means of 8-Hydroxyquinoline (Oxine). Cerous solutions containing ammonia and tartrate give a greenish gray precipitate of $Ce(C_8H_6ON)_3$ when treated with oxine. The precipitate can be weighed after drying at 110° , or it can be titrated with bromate. The method yields satisfactory results with 10–50 mg. of trivalent cerium. If tetravalent cerium is present, reduce it by heating with hydroxylamine hydrochloride until the solution is colorless. When tetravalent thorium and trivalent cerium are both present, the thorium can be precipitated by oxine in the presence of acetic acid. After washing the yellowish red precipitate with hot water the cerium can be precipitated in the filtrate by adding 10 cc. of concentrated sodium tartrate solution, heating to 60° , making distinctly ammoniacal and adding more oxine solution.—R. BERG and E. BECKER. *Z. anal. Chem.*, 119 (1940), 1–4. (S. W. G.)

Citrates. A discussion of uses with twenty-five references.—M. A. LESSER. *Drug and Cosmetic Ind.*, 48 (1941), 33–36. (H. M. B.)

Citric Acid—Determination of. Acetone is used in place of water for extracting citric acid from makhorka (*Nicotiana rustica*). The precipitates of pentabromoacetone obtained are sufficiently pure, judging from the melting-point data.—G. A. KORZENJENOVSKIĬ. *Vsesoyuz. Nauch.-Issledovatel. Inst. Tabach. Makhoroch. Prom.*, No. 140 (1939), 134–137; through *Chem. Abstr.*, 34 (1940), 4862. (F. J. S.)

Collodion—Preparation of. Collodion may be prepared from wood cellulose or from mixtures of wood cellulose and cotton, as well as from cotton alone, the only difference being a change in viscosity.—K. G. KREBS. *Pharm. Zentralhalle*, 80 (1939), 81–86; through *Chimie & Industrie*, 42 (1939), 675. (A. P.-C.)

Committee on General Chemistry—Report of, September, 1939. Reports of sub-committees on alkaloids and alkaloidal salts (corrections for melting points), on general organic chemicals (assay of camphor by dinitrophenylhydrazine and modifications in method of assay of trypsin), and on inorganic chemicals (revision of some limits for lead and arsenic; method of determination of lead; limit test for iron; tests for metals and acid radicals; new monographs on calamine, basic bismuth gallate, magnesium sulfate, potassium chloride, sodium pyrosulfate, secondary sodium phosphate, and sodium sulfate) are given.—*Gen. Med. Council, Brit. Pharm. Comm. Rept.*, 14, 29 pp.; through *J. Soc. Chem. Ind.*, 59 (1940), 169. (E. G. V.)

Copper—New Color Test for. A mixture of equal volumes of 10% sodium ethyl-1-methylbutylthio-barbiturate (pentothal sodium) and of concentrated ammonia gives an intense emerald-green color with copper, lasting several hours. It seems to be specific for copper. Attempts to use this reaction for the microdetermination of copper were unsuccessful.—C. H. LIBERALLI. *Rev. quim. farm. (Rio de Janeiro)*, 3 (1938), 153; through *Chimie & Industrie*, 42 (1939), 633. (A. P.-C.)

Dichloroethane Vapors—Determination of, in Air. Pass the air containing dichloroethane at the rate of 10 to 12 liters per hour through 3 connecting absorption flasks each containing 15 cc. of alcohol. To the combined solutions add 15 cc. of saturated sodium ethylate, reflux 2 hours, neutralize with 10% nitric acid and determine chlorine ion by the Stepanov nephelometric method.—S. L. GUINZBOURG. *Zavodskaya lab.*, 7 (1938), 1438; through *Chimie & Industrie*, 42 (1939), 810. (A. P.-C.)

Dispensing Balance—Weighings with a. Curiosity regarding the limitations of the ordinary and finer types of dispensing balances induced the

authors to carry out a series of weighings of potassium iodide from one grain up to two drams, and checking the weights of potassium iodide by means of a high-grade analytical balance and first-grade metric weights. The figures recorded during the weighings show that in everyday practice there is justification for carrying out weighings in the region of one grain of a substance on a balance of a sensitive type specially protected and used only for accurate work. The necessity for speedy weighing and ability to withstand hard usage make it unwise for makers to attempt to combine both functions in the same instrument, although something approaching an all-purpose balance is to be found in one of the balances tested. It is also shown that in a series of a dozen weighings the loss in the last powder may vary from $1/2$ gr. or more according to the balance, but that it is preferable in the interest of real accuracy to adopt this method rather than to make for a larger number of powders.—W. BROWN and J. P. TODD. *Pharm. J.*, 144 (1940), 137. (W. B. B.)

Drugs—Microanalysis of. VI. Place a drop of the solution to be tested in the reaction vessel and add bromine water until it imparts a yellow color to the mixture. Add a little piece of quartz to prevent bumping, boil and pass the gas evolved into baryta solution. The bromine oxidizes the formic acid to carbon dioxide, and as little as 0.0025 mg. of formic acid can be detected by the formation of a white turbidity of barium carbonate. Interference from carbon dioxide in the air can be prevented by covering the baryta solution with a little liquid paraffin.—O. FREDEN and K. FÜRST. *Mikrochemie (Mikrochim. Acta)*, 25 (1938), 256–257; through *Chimie & Industrie*, 42 (1939), 674. (A. P.-C.)

Dry Ice as a Preventive of Atmospheric Oxidation. The use of solid carbon dioxide has been found helpful in preventing oxidation of the stannous ion previous to the titration. It may serve equally effectively in other solutions.—G. E. FERGUSON and L. SCHEFLAN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 276. (E. G. V.)

Elixir of Iron, Quinine and Strychnine Phosphates—Assay of. The following assay is recommended: Measure accurately 100 cc. of the elixir (in duplicate) and place in Squibb separators of 300 cc. capacity. Make alkaline with ammonia T.S. and extract the alkaloids to exhaustion with chloroform using 30 cc. portions. Transfer the chloroform extractives to separatory funnels and extract with 2% sulfuric acid to exhaustion using 20 cc. portions. Transfer the acid solutions to separatory funnels and make alkaline with ammonia T.S. and extract to exhaustion with chloroform using 30 cc. portions. Return the chloroformic extractive to separatory funnels and wash with 10 cc. portions of water. Collect the chloroformic extractives in two tared beakers (250 cc.) after filtering through filters composed of pledgets of cotton moistened with chloroform inserted in funnels. Discard the water portions in separators, dry at 100° C. for one hour, cool and weigh as total anhydrous quinine and strychnine. Calculation for 100 cc.: $0.50 \text{ Gm.} \times 0.79 = 0.3950 \text{ Gm. quinine}$; $0.025 \text{ Gm.} \times 0.7137 = 0.0178 \text{ Gm. strychnine}$; total = 0.4128 Gm. quinine and strychnine (anhydrous).—WALTER D. DEMBECK. *Bull. Natl. Formulary Committee*, 9 (1941), 98. (H. M. B.)

Ether—New Method for Determining, in Air. An apparatus is described for making an ether-air mixture and the determination of ether. The latter is converted into ethyl iodide which is converted by bromine into ethyl bromide and bromine iodide. With an excess of bromine the following reaction occurs: $I\text{Br} + 3\text{H}_2\text{O} + 2\text{Br}_2 \rightarrow \text{HI} + 5\text{HBr}$. Since in the presence of potassium iodide in acid solution 6 iodine atoms are set free, 1 molecule of ether corresponds to 12 equivalents of iodine.

Titration is made with decinormal sodium thiosulfate. By this procedure 0.4 mg. of ether can be accurately determined using thirtieth-normal thiosulfate. The analysis requires 30 to 45 minutes.—K. BEYER. *Biochem. Z.*, 300 (1939), 113-121; through *Chimie & Industrie*, 42 (1939), 810.

(A. P.-C.)

Ethyl Carbamate—Test for the Limit of Water in. The following statement in the monograph is recommended: "When dried for 24 hours over sulfuric acid, ethyl carbamate loses not more than 2% in weight (water)." The following assay method is offered: Into a 200-cc. round-bottom, short-neck flask, place about 0.3 Gm. ethyl carbamate accurately weighed. Add 10 cc. of 75% (by volume) of sulfuric acid. Connect the flask with a reflux condenser and heat for 5 minutes and wash down the condenser with a portion of 100 cc. water, remove and add the remainder of the water. Cool and add an excess of a 50% solution of sodium hydroxide, keeping the temperature near room temperature. Distill the ammonia into 50 cc. 0.1N sulfuric acid and titrate the excess acid with 0.1N sodium hydroxide. Each cc. 0.1N sulfuric acid is equivalent to 0.008902 Gm. of $\text{NH}_2\text{CO.OCC}_2\text{H}_5$.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 9 (1940), 61-63.

(H. M. B.)

Extraction Tube—Modified Rohrig. The tube is intended to give better results in the Rose-Gottlieb method for estimation of fat in milk and milk products. It permits more thorough mixing and shaking of the sample and also allows control of gas pressure developed within the tube. By careful manipulation of the stopcock, the pressure may be slowly released and the tube blown down without loss of the sample.—C. W. SULLENS and W. RANKIN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 291.

(E. G. V.)

Ferrous Iron—Determination of, with Dichromate in the Presence of Brucine as Indicator. Titration of ferrous iron by dichromate in presence of brucine gives results accurate to 0.01%, and is therefore preferable to titration in presence of diphenylamine. The accuracy of the titration is independent of the presence of hydrochloric acid and of the concentration of ferric iron.—I. ALEXEIEVA and ANDRONIKOVA. *J. Prikl. Khim.*, 11 (1938), 1024-1027; through *Chimie & Industrie*, 42 (1939), 243.

(A. P.-C.)

Fluorescence—Indicators of. The following indicators produce fluorescence depending on acidity or alkalinity of the medium: litmus, curcuma, phenol red, acid carmine, azolitmus, sodium alizarine sulfonate, thymol blue, rosolic acid, *p*-xylene-sulfonphthalein, neutral red. In nearly every case fluorescence appears in two different colors as the p_H ranges from acid to alkali. Certain colored solutions cannot exhibit this change, but brown or yellow liquids usually react.—ANON. *Rev. quim. farm.*, 4 (1939), 107.

(G. S. G.)

Furnace for Micro-Carius Determination. The article describes a simple, home-made furnace which heats up to 250° C. in 15 minutes and cools down from 300° C. to room temperature in the same time.—J. A. KUCK and M. GRIFFEL. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 125-126.

(E. G. V.)

Glass Electrode—Laboratory Note on the. Colorimetric methods of measuring p_H are subject to disadvantages. In the electrometric methods the hydrogen electrode is cumbersome and the platinum used is prone to poisoning. The quinhydrone electrode is inaccurate on the alkaline side and affected by oxidation or reduction. Glass electrodes are not affected by such substances and are least subject to error, but determining the p_H of certain protein solutions and then immediately retesting often gives a different value. In the opinion of the author the

explanation is that the glass has picked up a film from the solution. Sometimes the film can be removed by repeatedly washing the electrode with water and p_H gradually drifts back to the true reading.—G. E. SHAW. *Chemist and Druggist*, 132 (1940), 435.

(A. C. DeD.)

Glutamine in Plant Tissue—Method for Determining. Glutamine is converted to ammonia and pyrrolidone carboxylic acid by hydrolysis in neutral solution. Conditions have been ascertained under which this acid can be quantitatively extracted from the mixture of plant tissue components. On being hydrolyzed, pyrrolidone carboxylic acid is converted into glutamic acid; accordingly the increase in amino nitrogen during this operation furnishes a measure of the glutamine amide nitrogen originally present in the tissue. The details of a method to determine glutamine on these reactions, have been developed and it is shown that satisfactory results are secured. The new procedure is a substitute for the convenient and accurate amide hydrolysis method, but is a more specific means of estimating glutamine when present in small amounts or in especially unfavorable conditions, such as in the presence of a large excess of asparagine or other substances that might interfere with the simpler hydrolytic method.—G. W. PUCHER and H. B. VICKERY. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 27-29.

(E. G. V.)

Hydrogenation—Development of the Technical Application of. A review.—E. F. ARMSTRONG and K. A. WILLIAMS. *Chemistry and Industry*, 59 (1940), 3-9.

(E. G. V.)

8-Hydroxyquinoline as a Reagent for Determining Magnesium. There are two procedures by which magnesium may be precipitated with 8-hydroxyquinoline ("oxine"): (a) by adding oxine to an ammoniacal solution containing ammonium chloride; (b) by adding ammonia to an acid solution containing oxine. The former is most suitable for gravimetric and volumetric work since it yields a purer precipitate. The authors have studied the effects of heat on the precipitates. A precipitation method, using oxine for determining magnesium gravimetrically in the absence of foreign salts except for a little ammonium chloride, has been modified and applied to solutions containing impurities comparable to those encountered in carbonate and silicate rocks. The modified method was found satisfactory for technical, but not for too refined analyses.—CHRISTINA C. MILLER and IAN C. McLENNAN. *J. Chem. Soc.*, (1940), 656-659.

(W. T. S.)

Iodine—Phenolated Solution of. This solution contains liquefied phenol 6, compound solution of iodine 15, glycerin 165 and water to 1000. The author shows that the reaction is essentially between the iodine and the aqueous phenol and that glycerin and potassium iodide are superfluous. The conversion of about half of the iodine to hydrogen iodide was confirmed by acidimetry and by titration with silver nitrate. In order to determine the course of this reaction the official direction was varied to find the maximum amount of iodine which will react, about 2.5 Gm. per liter. Using this amount, a red oil was precipitated and yellow crystals were sometimes obtainable. Analysis of these two substances indicated that they are monoiodophenols, while solubility and melting point below 40° C. of the crystals seemed to show the *ortho* variety. It seems probable, therefore, that the reaction between iodine and phenol proceeds according to the equation: $\text{C}_6\text{H}_5\text{OH} + 2\text{I} \rightleftharpoons \text{C}_6\text{H}_4\text{IOH} + \text{HI}$. It has been postulated in the past that no substitution can be possible unless something is present to react with hydrogen iodide. The explanation here is probably that dilution renders the latter inactive as a reducing agent. This is substantiated by the fact that con-

centrated solutions will not decolorize iodine.—A. J. PULVERENTI. *Mass. Bull. Pharm.*, (Oct. 29, 1939); through *Pharm. J.*, 144 (1940), 57. (W. B. B.)

Iron Arc as a Standard Source for Spectrochemical Analysis. The iron arc is useful as standard light source intended as an external standard for analysis. It is further suitable for plate calibration absorption work and for miscellaneous test work.—M. SLAVIN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 131-133. (E. G. V.)

Lactic and Pyruvic Acids—Determination of, by Means of Periodic Acid. *Lactic Acid. Apparatus.* A 200-cc. round-bottom flask is fitted with an upright Vigreux condenser and a tube for introduction of air (extends to bottom of flask). A glass tube is connected to the top of the condenser and is bent to come down to the bottom of a 150-cc. conical flask from which a second tube passes into another flask (50-cc.) which is open to the air. *Method.* Place 10 cc. of the lactic acid solution (0.1-1%) in the 200-cc. flask, add 10 cc. of 10% sodium periodate solution, make the solution acid with normal sulfuric acid and then add 2 cc. of about 10*N* sulfuric acid (20% by volume). Mix 10 cc. of mercurial reagent (mercuric chloride 27 Gm., potassium iodide 72 Gm., distilled water to make 250 cc.) with 15 cc. of sodium hydroxide solution (d. 1.33); transfer 5 cc. of the mixed reagent to the second absorption flask and place the remainder of the mixed reagent in the first absorption flask. The amount of reagent should be increased when the sample contains more than 70 mg. of lactic acid. Add to the reagent in the first absorption flask 5 cc. of a 20% suspension of barium sulfate. Connect the apparatus and pass air through the system at the rate of about 10-20 liters per hour. Heat the reaction mixture to boiling and maintain the temperature for thirty minutes to allow complete absorption of the aldehyde. Transfer the contents of the second absorption flask to the first absorption flask, acidify with 25 cc. of diluted sulfuric acid (20% by volume), add a known volume of 0.1*N* iodine and let stand with occasional shaking until the mercury disappears. Titrate the excess iodine with 0.1*N* thiosulfate. Let *N* represent the volume of iodine solution used up; then the weight of lactic acid in the sample is: lactic acid (in mg.) = $N \times 4.5$ mg. The average error is about -3%. A modification of the method for the determination of lactic acid in glucose-containing solutions is given. Iodometric and acidimetric procedures for the determination of pyruvic acid, after oxidation with periodic acid, are given.—R. BOISSON. *J. pharm. chim.*, 31 (1940), 240-255. (S. W. G.)

Lead—New Microchemical Test for. As little as 0.00002 mg. of lead in a dilution of 1 in 40,000 can be detected by the formation of $2Pb(NO_3)_2 \cdot 11CS(NH_2)_2$. The compound can be formed by evaporating the nitric acid solution containing lead to dryness, moistening the perfectly dry residue with 1 drop of twice normal nitric acid and sprinkling some granules of thiourea over.—C. MAHR. *Mikrochemie*, 26 (1939), 67-71; through *Chimie & Industrie*, 42 (1939), 631. (A. P.-C.)

Lithium Oxalate—New Monograph for.—J. J. KENNEDY. *Bull. Natl. Formulary Committee*, 9 (1940), 58-59. (H. M. B.)

Manganese—Determination of, in Organic Material Containing Large Amounts of Calcium and Chlorides. A procedure is presented for the determination of small amounts of manganese in ash which is high in calcium and chlorides. An essential feature in the method consists in removing chlorides with a minimum amount of sulfuric acid, thus preventing the formation of calcium sulfate. Filtration, therefore, becomes unnecessary and the danger of losing manganese in the process of filtering and

washing is eliminated.—THOMAS W. RAY. *J. Biol. Chem.*, 134 (1940), 677. (F. J. S.)

Magnesium—Determination of, in Pharmaceutical Mixtures. Magnesium can be determined in mixtures containing calcium and bismuth salts, sodium bicarbonate, etc., by precipitating as magnesium ammonium phosphate, dissolving the precipitate in a known amount of standard hydrochloric acid, and back-titrating with sodium hydroxide in presence of a mixture of methyl orange and methylene blue.—G. YA. KHAIT. *Farm. Zhur.*, 12 (1939), No. 2, 22-26; through *Chimie & Industrie*, 42 (1939), 1023. (A. P.-C.)

Manganese—Improvement of Formaldoxime Colorimetric Method for. The authors formaldoxime colorimetric method for manganese was found inadequate by Wiese and Johnson and in more recent studies also by the author in biological materials high in phosphates. However, the interference of phosphates can be eliminated by precipitation with lead in acetic acid solutions and the original method may be employed with very satisfactory results.—C. P. SIDERIS. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 307. (E. G. V.)

Magnesium—Test for, with *p*-Nitrobenzeneazoresorcinol. The qualitative test for magnesium employs the reagent *p*-nitrobenzeneazoresorcinol, commonly called S. and O. reagent, which produces a sky-blue lake in a magnesium solution made alkaline with sodium hydroxide. The effect of forty-four of the common ions upon the *p*-nitrobenzeneazoresorcinol test for magnesium has been studied. Although many of the metals of the first three groups interfere, they will have been removed, in the usual qualitative procedure, before the test for magnesium is made. Aluminum, barium, calcium and strontium ions, which give so much trouble in the phosphate test for magnesium through the formation of similar white precipitates, do not interfere at all with the S. and O. test. Very few anions interfere. The test, although not specific for magnesium in the strictest sense, is very satisfactory, useful and efficient when properly applied.—J. P. MEHLIG and K. R. JOHNSON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 30-31. (E. G. V.)

Mensol—Monograph for.—S. L. HILTON. *Bull. Natl. Formulary Committee*, 9 (1940), 66. (H. M. B.)

Mercury and Halogen—Microdetermination of, in Organomercuric Halides. A modification of the Zachere-Krainick method, involving dichromate in sulfuric acid as the oxidizing agent, has been used for volumetrically determining chlorine or bromine and mercury in the same sample of an organomercurial. The procedure employed is fully outlined, and a drawing of the apparatus used for the halogen determination is given. The results of analyses of 8 representative organomercurials are tabulated which showed the average per cent error for halogen to be 1.3 and for mercury to be 0.8.—GLADYS O. STONESTREET and GEORGE F. WRIGHT. *Can. J. Research B*, 18 (1940), 246-251. (W. T. S.)

Mercury—Determination of, in Air by Means of Dithizone. The method is based on the absorption of the mercury vapors from the air by means of a neutral or acid (sulfuric) solution of potassium permanganate. As mercury cannot be determined directly in the absorbent because permanganate decomposes dithizone, the permanganate is first destroyed by means of oxalic acid.—N. S. KOUZIATINA. *Zavodskaya Lab.*, 8 (1939), 174-177; through *Chimie & Industrie*, 42 (1939), 809. (A. P.-C.)

Mercury in Complex Ions—Method for the Determination of. The method developed involves treatment of the compound with zinc in a Kjeldahl flask. After reduction is complete nitric acid is

added in several portions. The solution is titrated with tenth-normal potassium thiocyanate with ferric ammonium sulfate as indicator. A detailed procedure is given. The method has been used for ointment of ammoniated mercury and ointments containing ammoniated mercury and zinc oxide.—JOHN T. READ and ROGER F. MAIZE. *Jour. A. Ph. A.*, 29 (1940), 436. (Z. M. C.)

Mercury in Mercurochrome—Determination of. The mercury content of mercurochrome may be rapidly determined by boiling the compound with aqueous potassium hydroxide solution and zinc filings, dissolving the amalgam so formed in nitric acid and titrating the mercury with thiocyanate. The results so obtained are in agreement with those given by the British Pharmaceutical Codex assay method and by methods involving the destruction of the mercurochrome by oxidation.—G. J. W. FERREY. *Chemist and Druggist*, 132 (1940), 434. (A. C. DeD.)

Morpholine Soaps. Morpholine, which may be regarded as the anhydride of diethanolamine, and has the formula $\text{NH}(\text{C}_2\text{H}_4)_2\text{O}$, is a cyclic secondary amine. It is a colorless, strongly alkaline liquid, with an odor of ammonia, and boils at 128°C . Like the ethanolamines, it is capable of combining with fatty acids to form soaps, e. g., the stearate, oleate, linoleate and myristate, and these soaps are now finding some use in cosmetics. Morpholine gives a very characteristic reaction with a dilute solution of gold, and this may be used for its detection. If 0.3 cc. of morpholine is mixed with 1 cc. of a solution containing 1 part of gold in 50,000 and the mixture is boiled, red-violet flakes are obtained.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 264. (A. C. DeD.)

Nitroglycerin—Microdetermination of, in Pharmaceutical Preparations. Published methods of determining nitroglycerin (I) are critically reviewed. A modified U. S. P. method and its application to small amounts of I in pills, etc., are described.—C. TOFFOLI. *Rend. ist. Sanita pubbl.*, 2 (1939), 587; through *Chem. Abstr.*, 34 (1940), 4521. (F. J. S.)

Opianic Acid—Properties of. Contrary to indications given in Beilstein, opianic acid is very soluble in hot water, 120 parts in 100 parts of water. Its solubility in ether, on the contrary, is very low. When dissolved in alcohol opianic acid is to a great extent (completely after some time) converted into pseudoethyl ether.—A. S. TCHERNYCHEV. *J. Obshch. Khim.*, 8 (1938), 1254; through *Chimie & Industrie*, 42 (1939), 673. (A. P.-C.)

Organic Carbon—Microdetermination of, by the Wet Method. The apparatus described consists of a two-leg reaction flask and a gas measuring burette. The oxidizing agent is composed of 0.1 Gm. of finely divided chromic anhydride in 1 cc. of heated concentrated sulfuric acid.—E. F. DEGERING and T. Z. BALL. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 124-125. (E. G. V.)

Organic Compounds—Purification of. Crystalline organic compounds which are sparingly soluble in water are freed from adherent liquid impurities by agitating with an aqueous sulfonated hydrocarbon, C_8-18 . The treatment of acetoacetylides, for example, with sodium lauryl sulfonate, is specifically claimed.—J. I. CARR, assignor to E. I. DU PONT DE NEMOURS & Co. U. S. pat. 2,092,797; through *J. Soc. Chem. Ind.*, 59 (1940), 118. (E. G. V.)

Organic Microanalysis—Systematic Qualitative. The construction and use of a microrefractometer is described.—H. K. ALBER and J. T. BRYANT. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 305-307. (E. G. V.)

Paraldehyde—Determination of. The method consists in titrating paraldehyde in ten times normal sulfuric acid solution with half-normal potassium permanganate. Numerous compounds frequently present with paraldehyde (acetaldehyde, vinyl acetate, aldol, formic acid) interfere and must first be removed by treating with silver oxide.—G. V. ZAVAROV. *Zavodskaya Lab.*, 8 (1939), 171-174; through *Chimie & Industrie*, 42 (1939), 634. (A. P.-C.)

Phenol Compounds—Quantitative Methods for the Determination of. Chlorometric, bromometric and iodometric methods for the analysis of phenolic medicinal preparations are critically discussed. They are very sensitive and directions for them should give approximate data regarding the period of action of the halogens, the concentration, etc.—M. CHORZELSKA. *Kron. Farm.*, 37 (1938), 39-41, 55-58; through *Chem. Abstr.*, 34 (1940), 4230. (F. J. S.)

Photoelectric Spectrophotometer—Null Type. A null-type photoelectric spectrophotometer employing barrier-layer photocells is described. The instrument can be used for accurate spectrophotometric measurements, the study of colorimetric methods of analysis and other types of absorption measurements.—C. J. BARTON and J. H. YOE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 166-168. (E. G. V.)

Pyrogen-Free Water—Emergency Preparation of. Shaking for fifteen minutes with powdered charcoal (1 part per 1000) removes pyrogens from heavily contaminated water. The charcoal can be readily separated by decanting through a filter paper. This provides a simple emergency method for obtaining water suitable for preparation of intravenous infusions.—J. C. LEES and G. A. LEVY. *Brit. Med. J.*, 4132 (1940), 430. (W. H. H.)

Qualitative Spectrographic Analysis in the Arc, with Graphite Electrodes. The methods and apparatus used for qualitative spectrographic analysis with a direct current arc are described. From comparative studies of anode and cathode excitation it is concluded that anode excitation is generally preferable. The factors affecting the sensitivity of detection of an element are discussed, and sensitivity data are given for typical analysis.—W. C. PIERCE, O. R. TORRES and W. W. MARSHALL. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 41-45. (E. G. V.)

Quantitative Spectrochemical Analysis by Measurement of Relative Intensities. A method is described which combines flexibility of application with the improved precision resulting from modern methods of photometry. Applications have been made to samples in which the main component is lead, aluminum, iron, copper, nickel and alkaline earth oxides, respectively, with an average precision of 50 to 100 parts per thousand of element determined.—E. K. JAYCOX and A. E. RUEHLE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 195-196. (E. G. V.)

Salicylic Acid—Colorimetric Determination of. The experimental conditions for determining salicylic acid colorimetrically with the Pulfrich photometer are noted. Results agree within 0.20%.—G. ILLARI. *Ann. chim. applicata*, 28 (1938), 524-529; through *Chimie & Industrie*, 42 (1939), 674. (A. P.-C.)

Salts of Organic Acids—Equivalent Weights of. The basic ions are electrodialedyzed through a sintered-glass membrane, above which stands negatively charged mercury. The base reacts with an excess of standard acid which is placed above the mercury. The amount of base present in the sample is found by titrating the excess standard acid with standard base. Equivalent weights can be determined from

samples as small as 0.3 mg. Theoretical and experimental equivalent weights for sodium tartrate, sodium citrate, calcium acetate, calcium lactate and zinc acetate are in close agreement.—K. H. DITTMER and R. G. GUSTAVSON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 297–299. (E. G. V.)

Semimicro-Dumas Method for Difficult Compounds. A procedure is given for the determination of nitrogen in carbon compounds which form methane and tars upon pyrolysis. A special nitrometer for use in this procedure is described.—A. R. RONZIO. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 303–304. (E. G. V.)

Silver—Photometric Microdetermination of. The method is based on the formation of red silver chromate under conditions such that a colored colloidal solution is obtained rather than a precipitate. It is suitable for determining 0.025 mg. of silver.—H. G. KRAINICH. *Mikrochemie (Mikrochim. Acta)*, 26 (1939), 158–164; through *Chimie & Industrie*, 42 (1939), 794. (A. P.-C.)

Sodium Carbonate in Sodium Bicarbonate—Detection of. The presence of 0.5% of sodium carbonate in sodium bicarbonate can be detected as follows: to 1 Gm. of sodium bicarbonate in a test-tube add 5 cc. of water and cautiously stir a few times with a glass rod; decant the liquid into another test-tube; treat the residue with 5 cc. of water, stir and decant the liquid; to each solution add 5 drops of 1% alcoholic phenolphthalein solution, mix well and note the red colors; if sodium carbonate is present the first liquid shows red more strongly than the second.—L. ROSENTHALER. *Pharm. Acta Helv.*, 13 (1938), 362; through *Chimie & Industrie*, 42 (1939), 315. (A. P.-C.)

Soya Bean Meal—New Monograph for.—R. K. SNYDER. *Bull. Natl. Formulary Committee*, 9 (1940), 88–90. (H. M. B.)

Spectrographic Analysis—Solution Method for. The technique, designed for use with a cold high potential spark, involves a slow and regulated addition of the solution through a hollow upper electrode.—R. J. KEIRS and D. T. ENGLIS. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 275–276. (E. G. V.)

Sulfate—Determination of, by Tetrahydroxyquinone Method. Sulfite has some effect on the tetrahydroxyquinone method of sulfate determination and a simple method has been established for its elimination. A rough correlation was found to exist between sulfite present and sulfite titrated. Restrictions and suggestions for the tetrahydroxyquinone method are presented.—H. L. KAHLER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 266–267. (E. G. V.)

Sulfonamides—New Reaction of. *p*-Cresoltyrosinase Reagent. Sulfanilamide, *p*-NH₂C₆H₄SO₂NHC₆H₄SO₂NMe₂, *p*, 2-*p*-aminobenzenesulfonamidopyridine, di-*p*-acetamidophenyl sulfone and *p*-NH₂C₆H₄SO₂CH₂CONH₂ give colors (varying shades of red) with *p*-cresoltyrosinase, whereas *p*-PhCH₂NHC₆H₄SO₂NH₂ and di-Na₂*p*- α , γ -disulfo- γ -phenylpropylaminobenzenesulfonamide do not.—FERNAND WYSS-CHODAT and ROGER PAILLARD. *Compt. rend. soc. phys. hist. nat. Genève*, 56, 50; through *Chem. Abstr.*, 34 (1940), 4225. (F. J. S.)

Tablets of Calomel and Soda. The following test for free mercury in these tablets is offered: Place a tablet on a slide with a crystal of iodine near but not touching it; allow these to remain covered for 15 minutes; brush off the crystal of iodine and examine the surface of the tablet with the low power lens of a microscope using vertical illumination. No red particles are observed.—R. K. SNYDER. *Bull. Natl. Formulary Committee*, 9 (1940), 87–88. (H. M. B.)

Tannic Acid—Test for. The following quantitative test (precipitation of cupric acetate) was adopted for tannic acid: Dissolve 1.5 Gm. cupric sulfate in 40 cc. water, add this solution to 1 Gm. of the tannic acid in 20 cc. water and then add 1.7 Gm. sodium acetate crystals dissolved in 10 cc. water. Lastly, add 0.5 cc. acetic acid and mix. After three or four hours collect the precipitate on a tared filter, wash until there is no indication of sulfate and dry near 100° to constant weight.—D. B. DOTY. *Pharm. J.*, 144 (1940), 137. (W. B. B.)

Thallium—Determination of, in the Presence of Other Metals. Like lead, thallium forms a precipitate with thiourea of the formula TlNO₃.4ThiH in which Thi is SC(NH₂)₂. Whereas the lead salt of the formula Pb(ClO₄)₂.6Thi is easily soluble, the corresponding TlClO₄.4Thi is very difficultly soluble. It is possible to separate thallium from most other ions by means of thiourea in a solution containing perchloric acid. To the solution containing about 2% of perchloric acid add an equal volume of 10% thiourea solution; let stand, while cooling by a stream of cold water; for half an hour; filter, wash the precipitate with a 5% solution of thiourea which contains a little perchloric acid; change the receiver and dissolve the precipitate in hot water; make acid with perchloric acid and repeat the precipitation with thiourea; the thallium can be determined as chromate by adding potassium chromate and ammonia to the hot aqueous solution. It is quicker to oxidize the thallium from the monovalent to the trivalent state with bromine in the presence of hydrochloric acid, remove the last traces of bromine with phenol, add potassium iodide and titrate the iodine (liberated by the reduction of the thallium from the trivalent to the monovalent state) with sodium thiosulfate. The results of 9 experiments, each with about 32 mg. of thallium, were good.—C. MAHR and OHLE HERTHA. *Z. anal. Chem.*, 115 (1939), 254–257; through *Chimie & Industrie*, 42 (1939), 630. (A. P.-C.)

Theophylline Sodium Acetate—Assay of. Theophylline may be determined in presence of sodium acetate by van Giffen's modification of Boie's method for determining the theobromine content of theobromine sodium salicylate, which involves the principle of neutralizing the sodium combined with theobromine, followed by precipitation of the theobromine as silver theobromine and titration of the nitric acid liberated from the silver nitrate. If, however, bromocresol purple is used as indicator instead of phenol red, sharp end-points are obtained in tests on solutions containing theophylline and sodium acetate.—G. J. W. FERREY. *Chemist and Druggist*, 132 (1940), 435. (A. C. DeD.)

Thermoelectric Absorptiometer for Analytical Work. An improved thermoelectric absorptiometer employing thermopiles has been constructed. The thermopiles are steady, sensitive and rapid, and are used in a balanced circuit that compensates for slight fluctuations in source intensity. The instrument is rugged and compact, and is capable of direct reading to an accuracy of 0.1% light absorption. The test-tubes used for absorption cells are easily cleaned and dried, and are interchangeable. Ten cc. of liquid are sufficient for a determination.—H. H. WILLARD and G. H. AYERS. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 287–291. (E. G. V.)

Thiamine Chloride in Certain Pharmaceutical Preparations—Colorimetric Determination of. The principle that thiamine will couple with diazotized *p*-amino-acetophenone to produce a purplish red compound has been utilized in tests developed recently. A modification of the Prebluda-McCollum method which requires no more than 30 minutes has been worked out. It has been applied to the analysis of pharmaceutical mixtures containing as

little as 20 micrograms of thiamine chloride per Gm. of sample. Experimental details are reported. An addendum gives procedure for a colorimetric determination of thiamine chloride in presence of ascorbic acid.—M. E. AUERBACH. *Jour. A. Ph. A.*, 29 (1940), 313. (Z. M. C.)

Tricresylphosphate—Test for. The following method is suggested as a simple test for the presence of tricresylphosphate in edible oil, the limit of the test being about 0.01%. Five drops of the oil mixed with 10 drops of alcohol and a fragment of caustic potash (about 0.1 to 0.2 Gm.) are heated together until the potash has dissolved and the oil is saponified. About 5 cc. of water are added, which should give a clear solution. A weak solution of diazotized *p*-nitraniline is added, care being taken that the solution remains alkaline. If tricresylphosphate were present in the original oil the liquid becomes red owing to the formation of an azo dye. It is advisable to carry out a control test on a sample of oil known to be pure. The diazotized *p*-nitraniline is prepared by shaking a small quantity of *p*-nitraniline with about 10 cc. of cold water, the clear yellow solution filtered or decanted off and one drop of acetic acid added. Sodium nitrite solution (about 5%) is gradually added with shaking until the solution becomes practically colorless.—M. WILLIAMS. *Report of the Chief Medical Office of Health, H. M. Stationery Office*, (1938), 191; through *Pharm. J.*, 144 (1940), 41. (W. B. B.)

War Materials—Methods of Detection of, Assembled from the Literature. A review dealing with dichloroethylsulfide, arsenic compounds and of the "Green Cross" filling type.—GEORGE DULTZ. *Wien. Pharm. Wochschr.*, 72 (1939), 548-551. (H. M. B.)

Zinc-Eugenol Cement—New Monograph for. As a result of experiments dealing with setting time of the cement, tests for rosin and zinc acetate, and assays for rosin and total zinc, a monograph is proposed.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 9 (1940), 52-57. (H. M. B.)

PHARMACOGNOSY

VEGETABLE DRUGS

American Vetiver and Its Production.—HAROLD A. LEVEY. *Drug and Cosmetic Ind.*, 47 (1940), 534-536, 538. (H. M. B.)

Citrus Mitis Blanco—Pharmaceutical Study of the Leaves of. The tree is known as calamansi and calamand in the Philippines, as Chinese orange in Hawaii, and as Panama orange in Florida. It is a spiny tree with elliptic leaves, white flowers and yellow globose fruit 2 to 2.5 cm. in diameter. The fruit juice is popular as a soft drink and is also mixed with soy bean sauce as an appetizer. It is also used in shampoos, as a cough remedy, a stimulant, carminative, deodorant and antiplogistic. It is an excellent source of vitamin B and contains some vitamin C and calcium. The leaves had not heretofore been studied. Preliminary tests on aqueous extracts of the leaves showed the presence of tannins, glucosides and cyanogenetic substances; they yield a volatile oil which contains aldehydes and sesquiterpenes. The minimum toxic dose of the oil to guinea pigs was 0.5 cc. In human adults 0.1 cc. gave moderate carminative effect and 0.15 cc. gave its strongest effect within one hour. It is a stronger carminative than peppermint oil.—ELENA VILLASIMBRA and LUZ OLIVEROS-BALARDO. *Rev. Filipina Med. Farm.*, 30 (1939), 267. (G. S. G.)

Clone in Pharmacognosy. The general question of plant classification is discussed as an introduction to the discussion of clone, the collective name for all plants asexually reproduced by division, grafting,

etc., from one (seedling) individual. Such a group is descended by mitosis from a common ancestor. The Ben Davis apple and the Concord grape are spoken of as varieties but calling them clones would be more fitting. The "Balm-of-Gilead" poplar, aconite and rhubarb are considered.—WILLIAM J. BONISTEEL. *Jour. A. Ph. A.*, 29 (1940), 453. (Z. M. C.)

Datura Plants—New, From Old Native Species. A large number of new varieties have been produced by the hybridization of two native species, *Datura alba* Nees and *Datura fastuosa* Linneaus. The process and varieties are described.—JUAN F. PASCASIO. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 177. (P. A. F.)

Drug Plants—Influence of Long Wave Ultraviolet Radiation on the Constituents of Different. A number of different drug plants were irradiated daily for varying periods of time and at the end of the vegetation period they were analyzed for their active constituents. The rays from the Hanauer quartz mercury vapor lamp were filtered so as to give chiefly rays of a wave length of 365 μ . The oil content of seeds of *Linum usitatissimum* was not changed. Irradiation for 30 minutes daily raised the alkaloid content of *Datura stramonium* from 0.100% to 0.254%. The ethereal oils of *Thymus vulgaris* and *Mentha crispa* were with a few exceptions decreased by the radiation. Daily irradiation for two hours decreased the glucosides of *Digitalis purpurea* about 43%. Longer exposure had no further effect. All of the irradiated plants showed an increase in H₂O content but it was not proportional to the time of exposure. Observations were also made on the effect of ultraviolet rays on the growth, time of blooming and anthocyanin formation by the plants. No consistent effect of the radiation was found but anthocyanin production appeared to accompany the retardation of plant development when it occurred. Thirty-seven references are given.—WERNER BRAUN. *Beitr. Biol. Pflanz.*, 26 (1939), 331-400; through *Chem. Abstr.*, 34 (1940), 4228. (F. J. S.)

Fennel in Washington—Cultivation of. For several years fennel has been cultivated in the drug garden at the University of Washington. Comparison of both fruit and oil has been made with old world specimens. The oil fails to meet U. S. P. requirements only in solubility in alcohol and congealing point. Washington-grown fruits are somewhat lighter in weight and not as full and plump as some European samples. It appears feasible to cultivate it in the United States.—TROY E. BECKER, EDWIN J. ISLER and FOREST J. GOODRICH. *Jour. A. Ph. A.*, 29 (1940), 499. (Z. M. C.)

Ferula Jaeschkeane Vatke—Chemical Investigation of the Fruits of. The ethereal oil of the fruits of *Ferula jaeschkeane* Vatke contains 91% *d*- α -pinene, 1.3% cumaldehyde, 5% azulene, 0.03% sulfur compounds and an aldehyde, the semicarbazone of which melts at 176-177°. The phenolic, acid and neutral fractions from the fruits contain compounds of the composition C₂₁H₄₄, C₉H₁₀O₈ and C₉H₈O₈. The resinous part was investigated by extraction with boiling NaOH, esterification and dehydration. The results indicate that the resin may be used for industrial purposes.—V. P. BERSUTSKI. *Bull. univ. Asie centrale*, 22 (1938), 119; through *Chem. Abstr.*, 34 (1940), 4522. (F. J. S.)

Folia Stramonii and Folia Belladonnae—Effect of Varying Drying Temperature upon the Total Alkaloidal Content of. The best drying temperature for both materials was between 50° and 60° in free air. Vacuum (14-16 mm.) at 30° gave a better product. Alkaloidal content was improved if the enzymes were destroyed by heating 15 minutes at 100° before drying. Rewetting or checking of the drying process and harvesting wet plants gave low yields.—

H. FLÜCK. *Heil- u. Gewürz-Pflanzen*, 18 (1939), 109; through *Chem. Abstr.*, 34 (1940), 3878.

(F. J. S.)

Fucus Vesiculosus—Determination of Iodine in. A modified Leipter apparatus is used for determining iodine in sea wrack (0.025-0.047% on dry weight); for the routine control of pharmaceutical supplies a rapid ashing process followed by a colorimetric determination of iodine is recommended. The combustion process for iodine (Schwaibold) is too long, but both methods give accurate results.—R. SEIFERT. *Süddeut. Apoth.-Ztg.*, 79 (1939), 555; through *J. Soc. Chem. Ind.*, 58 (1939), 1175.

(E. G. V.)

Indigenous Drugs of India—Inquiry of. A pharmacological study begun in 1926 and financed by the Indian Res. Fund Assoc. has advanced the knowledge of pharmacopoeial and allied drugs growing in India. The pharmaceutical industry in general and the manufacture of solvents in particular has forcefully developed as a result of the study. *Belladonna*, *digitalis*, *hyoscyamus*, squills, *colchicum*, *ephedra*, etc., are now being grown more widely and exports of some of these have expanded. Cultivation methods have been improved. The efficacy of certain indigenous drugs has been proved and other drugs formerly used shown to be worthless. The poisonous plants, including dangerous adulterants of foods, have been systematically studied and steps taken to warn people against their use. In short the study has made India more nearly self-sufficient from a medicinal standpoint.—EDITORIAL. *Indian Med. Gaz.*, 75 (1940), 368. (W. T. S.)

Lavandula Pedunculata. This aromatic plant is widely dispersed in Portugal. Chemical analysis was made for its possible industrial use, and for use in laundries. The fresh flowers were distilled and the products of this analysis indicated the presence of pinene, camphene, cineol, phenone, camphor and borneol, with traces of linalol and sesquiterpenes. *Lavandula pedunculata* Cav. differs from *Lavandula stoechas* L. solely in that the latter contains terpene carbohydrates. Both are of appreciable commercial use.—ALOISIO FERNANDES COSTA. *Noticias farm.*, 5 (1939), 438. (G. S. G.)

Marihuana Investigations. III. The Effect of Region of Growth of Hemp on Response to the Acid and Alkaline Beam Tests. In this research, a study was made of the resin content and Beam test response of plants grown under conditions differing widely with respect to rainfall, temperature, light and elevation. Experimental work is reported in considerable detail and the following conclusions reached: It is concluded that the climatic conditions under which *Cannabis sativa* is grown influence response to the acid and alkaline Beam tests but that this effect is small as compared with that of agronomic variety. The quantity of resins produced by plants is influenced by plant maturity, variety and environment. The relationship between the resin content and acid Beam test numbers is strong and the same for different varieties, different locations and different harvests.—B. B. ROBINSON and J. R. MATCHETT. *Jour. A. Ph. A.*, 29 (1940), 448.

(Z. M. C.)

Quinine Bark—Identification of. There is an enormous amount of substitution of and adulteration by other barks in the production of quinine. Some of them are known as "false quinines." The Brazilian Pharmacopœia recognizes yellow quinine, *Cinchona calisaya* Wedell, and quinine, *Cinchona succirubra* Pavon. A simple test is to heat some of the powdered bark in a dry test-tube; in the case of true quinine a red tar condenses on the walls of the tube just above the powder or bark. However some other barks have been found to give this coloration, and a further refinement includes observation

of the condensed vapors at the top of the tube. The quinines give a purplish red condensation, while other barks have a light grey deposit and less of it. A tube at least 18 cm. long should be used.—HENRIQUE LUIZ LACOMBE. *Trib. Farm., Parana*, 7 (1939), 184. (G. S. G.)

Saffron Production in Greece. About 300 acres were under crocus cultivation in Western Macedonia during 1939, compared with about 200 acres in the preceding year. The yield of red saffron from these acreages is estimated to have increased from 1000 to 1100 kilos in the year.—ANON. *Chemist and Druggist*, 132 (1940), 454. (A. C. DeD.)

Sorbus Domestica L. The chemical composition of the fruits is given.—R. SARTORY, E. WEIL and E. IKLADIOUS. *Bull. acad. méd.*, 122 (1939), 240; through *Chem. Abstr.*, 34 (1940), 4526. (F. J. S.)

Thymus Vulgaris and Thymus Serpyllum—Pharmacognostical Studies of. A brief history of both drugs is given; histology of both drugs is described; the powdered drugs are described and a means of distinction of the two drugs from each other is offered. Morphological and histological differences are enumerated in a table. The volatile oils of the thymes are discussed as to their properties, composition and origin. *Thymus vulgaris* was found to average 2% volatile oil, stems (over 1 mm. in diameter) 1.02%, other foreign matter 0.64, acid insoluble ash 0.85; values for *T. serpyllum* were 0.35%, 6.82, 1.50 and 1.01, respectively. The therapeutic values of the two plants are described. Forty-two references.—H. W. YOUNGKEN and H. S. FELDMAN. *Bull. Natl. Formulary Committee*, 9 (1940), 70-87. (H. M. B.)

Viburnum—Studies on. IX. The Pharmacognosy and Pharmacology of Viburnum Alnifolium. Report is made of an investigation undertaken with the idea of studying physical characteristics, histology and pharmacology of the stem bark of *Viburnum alnifolium* and to develop a means of distinguishing it from genuine Cramp Bark. Experimental work is reported in considerable detail. It had been found that this bark was being substituted for *Viburnum opulus* and also to adulterate Black Haw Tree Bark. *V. opulus* var. *Americana* does not occur wild in the southern United States. A description is given of the histology of ten different thicknesses of the stem bark of *V. alnifolium*. In the powdered bark, stellate hairs from the naked winter buds were found. Macroscopic and microscopic points of difference between the younger and older stem barks of both species are explained. In addition to the typical uterine sedative and depressor action of the medicinal viburnums previously studied, this bark seems to contain an unknown toxic constituent hence should not be used under the same conditions.—HEBER W. YOUNGKEN and JAMES C. MUNCH. *Jour. A. Ph. A.*, 29 (1940), 439. (Z. M. C.)

PHARMACY

GALENICAL

Ascorbic Acid—Formation of Oxalic Acid in Solutions of. Solutions of ascorbic acid, of calcium ascorbate and of ethanolanime ascorbate were kept in sealed ampuls at 27° and 28° for one year or longer. There was a variable but definite formation of oxalic acid with corresponding loss of ascorbic acid. The coefficient of transformation does not depend on the temperature. The calcium salt showed the highest degree of change.—A. E. JURIST and W. G. CHRISTIANSEN. *Rev. farm. (Buenos Aires)*, 82 (1940), 394. (A. E. M.)

Calcium Bromide—Obtaining, that is Stable on Storage. Good results are obtained by preparing

calcium bromide from ferric bromide and lime, the excess of which is subsequently precipitated with carbon dioxide. In order that the product may be stable the solution must be heated to, but not above, 195° to 200° C.; if the solution is overheated, part of the calcium bromide is decomposed with formation of lime.—L. S. DOROSINSKII and A. S. GLUKHKO. *Farm. Zhur.*, 12 (1939), No. 2, 26-27; through *Chimie & Industrie*, 42 (1939), 1023.

(A. P.-C.)

Datura Alba Nees (Solanaceae) and Strychnos Ignatii Berg. (Loganiaceae)—Pharmacopœial Study of the Galenical Preparations of. For the proposed Philippine Pharmacopœia the authors made and extracted different galenical preparations resulting in the formulation of pharmacopœial monographs for datura leaf, tincture of datura leaf, fluidextract of datura leaf, extract of datura leaf, datura seed and tincture of datura seed. No monograph was proposed for ignatia because the analysis of nux vomica seeds obtained from Los Baños indicated that the strychnine content of these two drugs is almost the same. Nux vomica can be grown cheaper in the Philippines than the imported.—PURA VILLARICA and PATROCINIO VALENZUELA. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 158. (P. A. F.)

Ferrous Sulfate—Permanently Stable Elixir of. A formula has been developed which seems to give a stable preparation with all the desirable features and few undesirable ones. The form of iron meets requirements in treating typical iron deficiency without causing gastrointestinal upset. The small amount of ferric iron present at first does not increase perceptibly after long storage. Following is the formula: Ferrous Sulfate, U. S. P. XI, 4.6 Gm.; Citric Acid, 0.2 Gm.; Spirit of Peppermint, 0.2 cc.; and Simple Syrup, U. S. P. XI, q. s., 100.0 cc. Experimental work is reported in detail and it is discussed also.—DONALD A. CLARKE. *J. A. Ph. A.*, 29 (1940), 499. (Z. M. C.)

Fluidextract of Krameria—Stabilization of. Stabilization studies on tannic acid solution and the fluidextract indicated that all samples showed some tannin loss although those containing 0.1% sodium bisulfite solution were definitely protected from tannin loss for a period of three months.—K. P. DuBOIS and C. O. LEE. *Pharm. Arch.*, 11 (1940), 90-93. (H. M. B.)

Glass—Determination of the Optical Protective Effect of, on the Preservation of Drugs According to the Swiss Pharmacopœia V. The protective action of brown glasses on ferric oxalate solution is determined in comparison with a standard glass. The glass under test can be considered to meet pharmacopœial requirements if, after illumination, the ferric oxalate solution which it protects does not contain more ferrous ions than a solution contained in the standard glass and treated similarly. The ferrous ion is determined by means of potassium ferricyanide solution.—J. THOMANN and A. KAELIN. *Pharm. Acta Helv.*, 13 (1938), 316-342; through *Chimie & Industrie*, 42 (1939), 315. (A. P.-C.)

Opium and Tincture of Opium—Changes in the Morphine Content of, During Ten Year's Storage. In ten years the anhydrous morphine content of opium decreased somewhat and that of tincture of opium increased. It is proposed to store the tincture in alkali-free and air-tight small bottles and avoid storage for more than 6 to 12 months. The acid number of the tincture increases with the time of storage.—I. NOVAK. *Magyar Gyógyszerészetud. Társaság Értesítője*, 15 (1939), 13-17; through *Chimie & Industrie*, 42 (1939), 670. (A. P.-C.)

Pepsin—Study of the Stability of Liquid Preparations Containing. A study has been made of the

stability of liquid preparations of pepsin. The influence of individual variables was considered fundamental. Factors considered were temperature, pH, anti-oxidants (maleic acid, hydroquinone, resorcinol), preservatives (alcohol, Merthiolate), protective agents (acacia) and low concentrations of amino acids (tyrosine). It was found that rate of loss in activity is greatest during the first six weeks. The advantage of refrigeration is not enough to warrant its use commercially. With maleic acid there was a marked loss in activity. Sodium maleate was alkaline enough to inactivate pepsin. Ionization has a marked influence; hydroxyl ions induce immediate inhibition; hydrogen ions in excess cause gradual loss of activity. Resorcinol and hydroquinone were of little value and solutions darken on standing. Alcohol and Merthiolate showed no discernible inhibition of activity. Acacia as a protective appeared valueless. Tyrosine apparently had no activating effect. Shaking for six hours did not cause increased loss of activity but twelve hours of shaking caused marked inactivation. Storage under nitrogen does not retard loss. It also appears that air oxidation has little to do with inactivation. It is evident that protein denaturation is primarily responsible for loss in peptic activity. Factors that promote protein denaturation also inactivate pepsin. Apparently water is conducive to protein denaturation.—C. J. KLEMMER and C. L. BOSWELL. *J. A. Ph. A.*, 29 (1940), 497.

(Z. M. C.)

Procaine Hydrochloride Solution—Behavior of, on Sterilization. The solutions become opalescent on boiling with 1 cc. of N NaOH and 10 cc. produces a precipitate which is flocculent in the presence of microorganisms. Confusion with Hg(CN)₂·H₂O is unlikely except with precipitates due to the use of a soapy vessel.—GÖRAN LILJESTRAND and HAROLD NILSSON. *Svensk. Farm. Tids.*, 40 (1936), 540; through *Chem. Abstr.*, 34 (1940), 4522. (F. J. S.)

Rhubarb—Extracts of. This reviews several official techniques for obtaining diverse types of extracts of rhubarb. Methods of the Pharmacopœias of Argentina, Switzerland, U. S., Spain and France are used, the Swiss method being preferred. This prescribes a dry extract with a dilute alcoholic menstruum: 100 Gm. rhubarb rhizomes with an equal amount of 50% alcohol.—TIMOTEO A. ESTIVIZ. *Rev. facultad cienc. quim.*, 14 (1939), 49.

(G. S. G.)

Tablets—General Monograph for. Procedures are offered for the calculation of maximum and minimum per cent variations in tablets, and comparison of the data obtained for commercial tablets and the N. F. tablets made in the laboratory is shown in tables. Results show that in some tablets considerable amount of tolerance range given in the N. F. is taken up by variation in the weights of the tablets.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 9 (1941), 107-114. (H. M. B.)

Tincture of Opium—Preparation and Storage of. Maceration (simple or repeated) gave tinctures with high morphine contents that remained constant after storage for 1 year. Content of dry matter generally did not change when the between of the tincture remained unchanged. Rubber stoppers are better than cork for closing the bottles. The acid number is a reliable indication of the age of tinctures. Even in the best storage conditions a significant increase of acid number was demonstrated after 1 year. This increase was greatest in a sample kept in the sunlight in a Jena bottle and least in a sample stored in the cellar, in darkness and in a rubber-stoppered bottle. In sunlight the morphine is partly converted to oxydimorphine.—MÁRIA M. KISS. *Ber. ungar. pharm. Ges.*, 16 (1940), 128; through *Chem. Abstr.*, 34 (1940), 4225. (E. J. S.)

Tincture of Quinine—Preparation and the Physical and Chemical Examination of. Cinchona, containing 7.52% active matter and 1.34% ash, was powdered and the tincture was prepared by the maceration method of the Pharm. Hung. III and the percolation process of Pharm. Ital. The products were examined by the method of Pharm. Hung. IV. with the modification that after addition of tragacanth powder the mixture was shaken for 5 minutes (instead of the prescribed 1 minute). The active matter, density and dry matter of the tincture prepared by percolation were 1.29%, 0.913 and 5.47%; of that prepared by maceration, 1.10%, 0.909 and 4.81%. For storage white bottles with cork stoppers and airtight capsules at room temperature are recommended.—MARGIT TANGELMAYER. *Ber. ungar. pharm. Ges.*, 16 (1940), 139; through *Chem. Abstr.*, 34 (1940), 4226. (F. J. S.)

PHARMACOPŒIAS AND FORMULARIES

British Pharmacopœia Addendum—Second. The General Medical Council will publish shortly a Second Addendum to the British Pharmacopœia, 1932, in which certain new monographs, and certain modifications of existing monographs, will be included.—ANON. *Chemist and Druggist*, 132 (1940), 385. (A. C. DeD.)

Chaulmoogra Oil—Chemistry of. Because of its use in the treatment of leprosy the Brazilian Pharmacopœia requires the following constants for chaulmoogra oil: Density at 25° 0.95; rotation in 10% chloroform 48° to 60°; acid number 10 to 28; saponification number 196 to 213; iodine number 98 to 104; melting point 25°. Brazilian chaulmoogra oil meets these requirements, but Asiatic oil is still preferred. The official species recognized are oils from the pressed seeds of *Hydnocarpus kurzii* (Warburg) and *wightiana* (Blume) first, then other species of *Hydnocarpus* such as *venenata* (Gaertner), *castanea* (Hook Thoma), *alpina* (Wight), *inebrians* (Vohl) and *macrocarpa* (Warburg).—HELENA POSSOLO. *Trib. Farm., Parana*, 7 (1939), 196. (G. S. G.)

Compound Pills of Cascara—Formula for. The present National Formulary formulas for the compound pills of cascara, pills of aloin, strychnine, belladonna and cascara and pills of aloin, strychnine and belladonna are criticized because they do not have the amounts corresponding to the proper U. S. P. doses for laxative action. Two revised formulas for the compound pills of cascara are offered.—J. P. SNYDER. *Bull. Natl. Formulary Committee*, 9 (1940), 44-45. (H. M. B.)

Eucalyptus Oil. The desirability of reducing the cineol content of eucalyptus oil from 70% to 55%, and introducing the change in the next edition of the British Pharmacopœia, has been suggested by the Indian Chemical Manufacturers' Association to the British Pharmacopœia Commission.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 276. (A. C. DeD.)

Menthol in DAB VI—Comment on Inclusion of Synthetic. Since February 1940 synthetic menthol (Mentholum Artificiale) has been included in the Ger. Phar. VI. The identity and purity tests are cited in the Swedish journal. Comment is made that the op. rot. is given as "optically inactive or

levorotatory." The two chief European manufacturers of synthetic menthol are Schimmel & Co. and Schering-Kahlbaum A. G. It is noted that Schimmel's synthetic menthol is weakly levorotatory, while the preparation offered by Schering-Kahlbaum is an isomer free racemate of *l*-menthol and is optically inactive.—B. STEENBERG. *Farm. Revy*, 39 (1940), 459. (C. S. L.)

Menthol in Germany. While up to the present only natural menthol has been recognized officially, the use of artificial menthol is now permitted for pharmaceutical purposes. The melting point of this artificial menthol is given as 32° to 36° C., and it may be either optically inactive or levorotatory. The wording of the official announcement is: "It has become necessary to recognize also artificial menthol beside the natural menthol."—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 99. (A. C. DeD.)

Swedish Formulary (Medicinal Bok) of 1937—Tests for Various Drugs and Chemicals of the. Purity and identity tests for various substances included in the 1937 Swedish Formulary are assembled from various official and unofficial sources with comments concerning their practical application. Over 80 different drugs are considered.—E. SANDELL. *Farm. Revy*, 39 (1940), 253, 271, 281, 293, 310, 325, 341, 357, 457, 465, 481, 497, 513. (C. S. L.)

Tikitiki and Extract of Tikitiki—Pharmacopœial Monographs on. Synonyms are rice bran, rice polishings, salvado, darak. The authors present proposed pharmacopœial monographs.—JESUSA CONCHA and PATROCINIO VALENZUELA. *Nat. App. Sci. Bull.*, 6 (1938), 309; through *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 144. (P. A. F.)

NON-OFFICIAL FORMULAS

Amino Glycol in Cosmetics. Amino glycol, the abbreviated name for 2-methyl-2-amino-1,3-propanediol, CH₃(CH₂HO)₂NH₂, is described and its uses in vanishing, hand, brushless shaving, protective, cleansing, tissue creams and hand lotions are discussed. Seven formulas are given.—JOSEPH KALISH. *Drug and Cosmetic Ind.*, 48 (1941), 31-32, 36-37. (H. M. B.)

Cosmetic Formulas—War-Time. A number of formulas for vanishing creams are given.—ANON. *Chemist and Druggist*, 134 (1941), 99. (A. C. DeD.)

Cosmetic Manual. Bath Salts. Plain bath salts (eight formulas) and the effervescent types are discussed as to ingredients and formulation.—JOSEPH KALISH. *Drug and Cosmetic Ind.*, 47 (1940), 644, 648, 705. (H. M. B.)

Medicine and Pharmacy—Substitute Materials in. A discussion of 20 formulas and 32 references.—JOSEF WIMMER. *Wien. Pharm. Wochschr.*, 73 (1940), 303-306, 311-314. (H. M. B.)

Root Beer Extract. Sarsaparilla 6, spikenard 1/2, wintergreen 2, birch bark 1, sassaparilla bark 4, wild cherry bark 1/2, prickly ash bark 1/4, Jamaica ginger root 1/8, nutmeg 1/8 ounce each, are reduced to a powder by grinding a percolated to one-half gallon with 33% ethyl alcohol.—D. ALGIE. *Food Ind.*, 12 (1940), No. 6, 104; through *Am. Perfumer*, 41 (1940), No. 4, 91. (G. W. F.)