VOL. VII, No. 4 APRIL 1941

PHARMACEUTICAL ABSTRACTS

Published by the American Pharmaceutical Association
2215 Constitution Ave., Washington, D. C.

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

ABSTRACTORS

WILLIAM B. BAKER
GERSTON BRUCH
HENRY M. BURLAGE
ZADA M. COOPER
AMELIA C. DEDOMINICIS
MELVIN F. W. DUNKER
GEORGE W. FIERO
PERRY A. FOOTE
RALPH R. FORAN
GEORGIANA S. GITTINGER
SAMUEL W. GOLDSTEIN
THOMAS C. GRUBB
H. B. HAAG
G. W. HARGREAVES
BERNICE HEYMAN
WILLIAM H. HUNT
CHARLES JAROWSKI
LEONARD KAREL
CLIFFORD S. LEONARD
NATHAN LEVIN
FREDERICK S. MALLETTE
ARTHUR E. MEYER
A. PAPINEAU-COUTURE
E. V. SHULMAN
FRANK J. SLAMA
EDGAR B. STARKEY
W. TAYLOR SUMERFORD
E. G. VANDEN BOSCHE
G. L. WEBSTER
ELMER H. WIRTH

CONTENTS

Chemistry:

Organic

Unclassified (*Continued*) 98

Biochemistry 98

Analytical 108

Galenical 120
Non-Official Formulas 121
Dispensing 122
Pharmaceutical History 124
Pharmaceutical Legislation 124
Pharmaceutical Economics 124
Miscellaneous 125

Pharmacognosy:

Vegetable Drugs 118
Animal Drugs 120

Pharmacology, Toxicology and Therapeutics:

Pharmacology 127

CHEMISTRY

ORGANIC

Unclassified (Continued)

Tannic Acid Derivative. Tannic acid is caused to react with ethylene or propylene oxide in the presence of an alkaline catalyst. The products possess light absorbing properties.—British pat. 510,891; through *Am. Perfumer*, 41 (1940), No. 4, 85. (G. W. F.)

Terpin Hydrate and Sobrerol. A discussion of compounds resulting from the oxidation or hydration of terpenes, particularly pinene. Terpin hydrate results from complete hydration of terpenes. Sobrerol results from simultaneous hydration and oxidation of pinene. It is the 2:8 glycol of tetrahydrocymene.—FRANCIS D. DODGE, *Am. Perfumer*, 41 (1940), No. 3, 29–30. (G. W. F.)

Tetracyclic Compounds of the Sexual Hormone Type—Experiments on the Synthesis of. The experiments were directed toward the synthesis of equilenin and similar compounds. The preparation of the key intermediate, 1-keto-7-methoxy-2-methyl-1:2:3:4-tetrahydrophenanthrene, has been improved. Its condensation with Δ^{δ}-pentenylmagnesium bromide, followed by permanganate oxidation and cyclization with phosphoric oxide, yielded a tetracyclic ketone, probably the ketomethoxymethylhexahydrochrysene from which a number of derivatives were prepared. The preparation and cyclization of 2-methyl-1-Δ^{γ}-butenyl-3:4-dihydrophenanthrene has been further studied. This diene is conveniently obtained pure by regeneration from its trinitrobenzene compound. It yields 2-methyl-1-butylphenanthrene by rearrangement over palladium. It is best cyclized to 16-methylhexahydrochrysene by phosphoric oxide at 140°. The tetracyclic hydrocarbon so obtained resists degradation of ring D.—V. C. E. BURNOP, G. H. ELLIOTT and R. P. LINSTEAD. *J. Chem. Soc.*, (1940), 727–735. (W. T. S.)

Thyroxine—Analog of. The synthesis of the 3,5-diiodo-4-hydroxyphenyl ether of thyroxin is described. The product is physiologically inactive as is the intermediate which has not been iodinated.—M. BOVARNICK, K. BLOCH and G. L. FOSTER. *J. Am. Chem. Soc.*, 61 (1939), 2472. (E. B. S.)

Vanillin-Mercury Compounds. A cold concentrated solution of mercuric acetate is diluted with water and then with alcohol until a cloudiness is formed, which is cleared with a few drops of acetic acid. A solution of vanillin in ethyl alcohol is warmed and as much water as possible added without causing the vanillin to separate. The two solutions are mixed and gently warmed. Gradually the liquid becomes turbid and finally gelatinizes, and, on standing, a heavy white powder separates. This is filtered off and dissolved in boiling glacial acetic acid from which it crystallizes on cooling. It is washed with water and dried *in vacuo* over sulfuric acid. It contains 48.45% of Hg; $C_6H_2(OH)(OCH_3)(CHO)$-Hg-COO-CH_3 requires 48.96% of Hg. The compound is therefore mercury-vanillin acetate. It forms white crystals insoluble in water, and the common organic solvents, but is soluble in boiling acetic acid. It gives no reactions for ionic mercury. When dissolved in the cold in concentrated sulfuric acid the white crystalline mercury-vanillin sulfate separates.—G. ROSSI and M. MAGNO. *Ann. chim. applicata*, 29 (1939), 146; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 622. (S. W. G.)

Vitamin E—Chemistry of. XVII. The Oxidation Products of α-Tocopherol and of Related 6-Hydroxychromans. When 6-hydroxychromans are oxidized by silver nitrate or by nitric acid, the products are red chroman-5,6-quinones. Any group in the 5-position of the hydroxychroman is eliminated in this reaction. Certain facts having a bearing on the mechanism of this reaction are reported. The structure of the *o*-quinone from 2,2,5,7,8-pentamethyl-6-hydroxychroman has been proved by synthesizing it from derivatives of *o*-xylohydroquinone. Certain similarities between the absorption spectra of these red compounds and known orthoquinones are discussed. The quantitative aspects of the photometric method of Furter and Meyer are discussed, and the limits of the reaction have been further defined and extended. The red chroman-5,6-quinone from α-tocopherol is an uncrystallizable oil. Evidence is presented to show that this substance forms a phenazine, although the latter is also an oil.—L. I. SMITH, W. B. IRWIN and H. E. UNGNADE. *J. Am. Chem. Soc.*, 61 (1939), 2424. (E. B. S.)

BIOCHEMISTRY

Amino Acids—Salting Out of, from Protein Hydrolyzates. A Method for the Isolation of *l*-Phenylalanine. The solubility of *l*-phenylalanine in water and in water saturated with sodium chloride at different p_H values has been determined. A new method involving the use pf picrolonic acid is detailed for the isolation of phenylalanine from protein hydrolyzates. *l*-Methionine picrolonate has been prepared and its melting point determined.—N. G. BAPTIST and W. ROBSON. *Biochem. J.*, 34 (1940), 221. (F. J. S.)

Androgen Therapy—Influence of, on Growth Rate of Hypogonadal Adolescent Boys. The administration of testosterone propionate in doses from 75 to 125 mg. per week to eight hypogonadal adolescent boys ranging in age between 9 and 18 years was followed by an increase in average growth rate from 1.36 cm. per 100 days during the control period to 3.6 cm. per 100 days during the period of therapy. Following cessation of treatment the average growth fell again to 1.56 cm. in 100 days.—BRUCE WEBSTER and WALTER HOSKINS. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 72. (A. E. M.)

Anesthetics—Effect of, on Blood. Studies were made on the effect of ether and of sodium amytal anesthesia on the erythrocyte count and on coagulation time of blood plasma. Three dogs were used, each being anesthetized three different times. Control samples were taken before each test and test samples were taken during and after anesthesia. Hemoglobin and hematocrit studies were also made. Under ether anesthesia the coagulation time was slightly decreased, and the blood platelet count, cell volume, hemoglobin and erythrocyte count were increased. Removal of the spleen reduced by one-half the increase in cellular constituents. Sodium amytal caused a decrease in cell volume, hemoglobin and erythrocyte count, but splenectomy abolished this decrease in cellular constituents.—PAUL W. SEARLES. *J. Am. Med. Assoc.*, 113 (1939), 906. (G. S. G.)

Antianemic Factor—Chemical Nature of. The method used by the author and co-workers for the preparation of the antianemic principle from liver was based on an initial extraction of the liver with acetone of a definite p_H. The extractive was then submitted to a considerable number of purification processes, including repeated elution from active charcoal. The product represents a concentration of 200,000 times the original liver, and the losses were not great. It has a slight orange color, and is easily soluble in water giving a solution having a p_H of about 5, with a blue fluorescence in ultraviolet light. The absorption curve shows inflections at 250 to 265$\mu\mu$ and 345 to 350$\mu\mu$. The substance is to some extent crystalline. The elementary composition is N, 13.3%; C, 53.64%; H, 6.85%. It

does not give the general reactions for amino acids, even after hydrolysis. A positive xanthoproteic and Hopkins-Cole reaction indicates the presence of cyclic amino acids. From its chemical and physical properties it appears to be a proteose, possibly a polypeptide.—H. M. MOA. *Medd. Norsk. Farm. Selsk.*, 1 (1939), 18, 25, 37; through *Quart. J. Pharm. Pharmacol.*, 13 (1940), 78. (S. W. G.)

Arsenicals, Bismuth and Iron—Influence of, on the Plasma Ascorbic Acid Level. Bismuth in therapeutic doses did not influence the level of blood ascorbic acid nor the hemoglobin. Ferrous sulfate and neoarsphenamine, given either separately or combined, decreased the blood ascorbic acid while the hemoglobin increased. The results show the necessity of an increased intake of ascorbic acid during treatment with these heavy metals be it to meet excessive requirements for physiologic demands or for detoxification.—CHESTER J. FARMER, ARTHUR F. ABT and HANS C. S. ARON. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 495. (A. E. M.)

Ascorbic Acid—Determination of, in Presence of Hemoglobin. In solutions containing oxyhemoglobin the rapid loss of ascorbic acid which occurs during precipitation of protein is not due to its direct interaction with oxyhemoglobin, nor to molecular oxidation catalyzed by the precipitate consisting of protein denatured by acid hematin. At the moment of precipitation of the protein by metaphosphoric acid the liberated oxygen oxidizes some of the ascorbic acid to dehydroascorbic acid, the loss being proportional to the amount of oxyhemoglobin present. This oxidation is prevented by carboxyhemoglobin, or by reducing the oxyhemoglobin in a Thunberg tube and immediately precipitating the protein under anaerobic conditions, preferably in oxygen-free nitrogen. Adsorption of ascorbic acid on the denatured protein may occur in concentrated solutions, accounting for a loss not exceeding 10%. The amount of oxygen, evolved by precipitation with metaphosphoric acid for equal amounts of hemoglobin in the presence and absence of ascorbic acid, as determined by the method of Peters and van Slyke in a van Slyke manometer, showed that the amount of ascorbic acid oxidized was less than the volume of oxygen evolved. A rise in temperature from 4° to 18° had very little effect on the oxidation of ascorbic acid in the presence of 20% of oxyhemoglobin.—R. LEMBERG and J. W. LEGGE. *J. Proc. Roy. Soc., N. S. W.*, 72 (1938), 62; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 772. (S. W. G.)

***l*-Ascorbic Acid—Photochemical Decomposition of. II.** The observations made by Kellie and Zilva that dehydroascorbic acid is formed by exposing *l*-ascorbic acid anaerobically in buffer solution to ultraviolet light has been confirmed by using the furfuraldehyde method for the determination of ascorbic acid. The evidence shows that the extent of the reaction is dependent on the intensity of the ultraviolet radiation. It is assumed that some ascorbic acid is decomposed during the exposure with the formation of a substance or substances capable of dehydrogenating some of the undecomposed *l*-ascorbic acid. Glutathione exercises a protective action against dehydrogenation. It is probable that any ultraviolet light penetrating superficial tissues containing *l*-ascorbic acid would bring about the oxidation of the vitamin *in vivo*.—C. L. ARCUS and S. S. ZILVA. *Biochem. J.*, 34 (1940), 61. (F. J. S.)

Barbiturates in Blood—Estimation of. A simple procedure has been developed for the extraction of unstable barbiturates from blood. It has been found satisfactory for use in the routine determination of any type of barbiturate.—G. A. LEVVY. *Biochem. J.*, 34 (1940), 73. (F. J. S.)

Bile Acids, Sex Hormones, Etc.—Synthetic Investigations on Degradation Products of. II. Synthesis of Keto-Desoxyestric Acid. By the extension of the method for the preparation of 7-methyl-*o*:3:3-bicyclooctanone, 9-keto-desoxyestric acid was synthesized. This method can be applied also for the synthesis of 1:2-di-substituted phenanthrenes.—D. K. BANERJEE. *J. Indian Chem. Soc.*, 17 (1940), 453. (F. J. S.)

Blood Coagulants—Some. Silica, *Capsella bursa pastoris*, herba plantaginis, *Achillea millefolium*, flores arnicae, fungus, chirurgorum, clauden, coagulen and manetol cause an acceleration of coagulation. The first two agents are the most effective. Formic acid, rhizoma tormentillae and radix arnicae hinder coagulation. A combination of silica with a decoction of the shepherd's purse plant decreases the effectiveness of the silica.—ED. KEESER. *Deut. Med. Wochschr.*, 65 (1939), 375–376. (L. K.)

Blood of Philippine Carabaos—Contribution to the Chemical Study of. The results of quantitative chemical determinations of certain blood constituents of twenty normal Philippine carabaos were found to be as follows in mg. per 100 cc. of blood: blood sugar 39.22 to 55.25; total nonprotein nitrogen 18.14 to 28.78; urea nitrogen 12.44 to 21.80; serum calcium 9.50 to 10.50; inorganic phosphate 3.90 to 8.00; chlorides as NaCl 446.00 to 495.00; iron 40.16 to 51.81; hemoglobin Gm. % 11.99 to 15.47; oxygen 16.06 to 20.72.—A. C. GONZAGA. *Philippine J. Sci.*, 71 (1940), 317. (P. A. F.)

Blood—Preventing Coagulation of. For preventing the coagulation of blood or plasma in a container such as that of an injection syringe or the like, the inner surface of the container is coated with a rare earth metal, such as neodymium or a difficultly soluble or insoluble compound of a rare earth metal such as neodymium oxide.—HANNS DYCKERHOFF. U. S. pat. 2,196,199, April 9, 1940. (A. P.-C.)

Blood Sugar Curve—Diagnostic Value of, after Peroral Galactose Dosage. A discussion.—TH. V. UEXKÜLL. *Deut. Med. Wochschr.*, 65 (1939), 415–419. (L. K.)

Cadmium Hydrate as a Defecting Agent for Biological Liquids. The solutions used are (*a*) 20% cadmium sulfate and (*b*) normal sodium hydroxide. The amounts used are as follows: for 1 cc. of blood, 0.5 cc. of (*a*) and 0.7 cc. of (*b*); for 1 cc. of hematids, 0.6 and 0.8 cc., respectively; for 1 cc. of plasma, 0.3 and 0.4 cc., respectively; for 1 cc. of cerebrospinal fluid, 0.2 and 0.3 cc., respectively; and for 10 cc. of milk, 1 and 1.4 cc., respectively.—M. PAGET and P. BAUDET. *Bull. Biol. Pharm.*, (1938), 436–437; through *Chimie & Industrie*, 41 (1939), 1075. (A. P.-C.)

Carotene—Physiological Significance of. The author surveys the present state of knowledge of the carotenoids and their relation to vitamin A, with numerous references to original sources. Although the carotenoids are products of plant metabolism their function in the plant itself is not clear, but for animals they are of vital importance inasmuch as they are the only substances from which the animal body can produce vitamin A. An account is given of the chemical constitution of the carotenes and a number of their oxygenated derivatives (xanthophylls), and of their occurrence in plants. The possible mode of cleavage of the carotene in its conversion into vitamin A in the animal body, and the bearing of this on the relative potencies of carotene and vitamin A are discussed. Some information is given about the presence of carotene and vitamin A in milk, and the vitamin A

requirements of human beings.—MORTON. *Chemist and Druggist*, 132 (1940), 117. (A. C. DeD.)

Carviolin (Coloring Matter of Penicillium Carmino-Violaceum Biourge)—Constitution of. Carviolin, a pigment of *P. carmino-violaceum* Biourge, has been shown to be a monomethyl ether of ω-hydroxyemodin. The compd. probably has a free β-hydroxyl group.—H. G. HIND. *Biochem. J.*, 34 (1940), 577. (F. J. S.)

Catgut—Study of Swelling of. The following procedure is used for determining the swelling: Fill a series of tubes (12 cm. long) with the liquid and insert a strand of catgut (15 cm. long), bearing a label at the end stating its original diameter, into each tube. Place the tubes in an oven at 37° and remove for measuring at the end of 10 minutes, 30 minutes, 3 hours, 24 hours, 48 hours, etc. Measure each strand at three different points, with the aid of a micrometer reading 0.01 mm., and record the mean value. The liquids used were: distilled water, alcohol, solutions of organic substances in alcohol, aqueous solutions of acids, bases and salts, blood, blood serum. The action in the living body was also noted. In most cases the changes are insignificant after 24 hours. To determine the effect in the body eight pieces of the same catgut were introduced into the posterior members of a guinea pig by means of a needle, and after each of the different periods given above a piece was removed and measured. In this case the greatest swelling was observed in the first 30 minutes with a slow increase occurring after that time. The percentage increase in diameter of the catgut was approximately the same for the blood serum and the animal tissue. The tabulated results are interpreted as follows: (1) The swelling of catgut in the body of an animal is effected principally by the action of the serum of the blood. (2) In order to know the maximum swelling which a piece of catgut will undergo in the body of an animal, place the catgut in some of the blood serum at 37° and measure its diameter in about 48 hours.—M. RUDERMAN. *J. pharm. chim.*, 30 (1939), 16–34. (S. W. G.)

Cerebral Bioelectrical Investigations in Humans—Some Assumptions Regarding. A review.—A. E. KORNMÜLLER. *Deut. Med. Wochschr.*, 65 (1939), 1601–1605. (L. K.)

Chlorides, Glycose and Urea—Analytic Methods for Testing, in Biologic Fluids. Various methods are compared for analysis of blood for chlorides, glycose and urea. The blood is collected from the finger tip or arm in a small glass tube and covered by oil or neutral paraffin. It is deproteinated by cadmium and sodium hydroxides, or by sodium tungstate and sulfuric acid. Sugar is estimated by the Folin-Wu copper sulfate method or by the Hagedorn-Jensen potassium ferrocyanate method. Chlorides are detected by silver nitrate, the method of Levinson, or by potassium permanganate and nitric acid, the method of Laudat. Urea is estimated by the gasometric method of Van Slyke. Difficulties in the uniformity of results are due to variations in the method, the uses of saline anticoagulants or paraffin oils. Since there are records of such tests on differing diseases, varied professions and occupations, and in ages ranging from infancy to old age, there is a necessity for a wide range in the so-called normal amounts of chlorides, sugar and urea in the blood.—GERARDO MAGELLA BIJOS. *Rev. Asoc. Brasil. Farm.*, 20 (1939), 102. (G. S. G.)

Cinchophen—Excretion and Determination of, in Bile. A method for quantitative determination of cinchophen in bile is described. In five anesthetized dogs of about 10 Kg. weight it was found that 20% of 1 Gm. intravenously injected cinchophen is excreted in the bile within 5 hours. In four chronic bile fistula dogs an average of 55%, or from 28% to 78%, of orally administered cinchopen (100 mg. per Kg. weight) was daily excreted in the bile. This shows that the liver is significantly concerned in the excretion of cinchophen and that an enterohepatic circulation of cinchophen may occur. Calculated by weight, sodium cinchophen increases the volume output of bile more than sodium dehydrocholate which is an excellent hydrocholeretic. Cinchophen in large doses, either orally or intravenously, decreases cholic acid output, but it cannot be concluded that cinchophen specifically interferes with cholic acid synthesis.—W. B. BRADLEY and A. C. IVY. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 143. (A. E. M.)

Decaffeinating Coffee. Raw coffee beans are treated in water in a rotating vessel in the presence of active carbon which is held in a water-permeable vessel (suitably with heating at 80° to 110° C. for 2 hours and addition of formic acid, evaporation of the water in vacuum and drying of the coffee to a 5% to 10% moisture content).—EUGEN BÜRGIN, assignor to MAX BRUNNER & CO. U. S. pat. 2,198,859, April 30, 1940. (A. P.-C.)

Detoxication—Studies in. IV. The Resolution of *dl*-Isomenthol Through Its Conjugation with Glucuronic Acid in the Rabbit. *dl*-Isomenthol has been resolved for the first time, through the isomenthylglucuronide synthesized in the rabbit, following oral administration of *dl*-isomenthol. The crude ammonium isomenthylglucuronate isolated from the rabbit urine gave, on recrystallization from water, ammonium *dl*-isomenthylglucuronate which appears to be a partially racemic compound of the Ladenburg type. This salt cannot be resolved as such, but on conversion into the free acid, crude *d*-isomenthylglucuronide was formed as a waxy solid. The crude material on recrystallization from water gave the pure crystalline acid identical with an authentic specimen. The glucuronide yielded optically pure *d*-isomenthol on hydrolysis. *l*-Isomenthol was not isolated in optically pure form, although material of 84% optical purity was obtained.—R. T. WILLIAMS. *Biochem. J.*, 34 (1940), 48. (F. J. S.)

Detoxification—Studies in. VI. Ethereal Sulfate Formation in the Rabbit after Administration of Sulfanilamide. When sulfanilamide is fed to rabbits, the ethereal sulfate output in the urine is increased. The increase in ethereal sulfate is proportional to the dose of the drug (0.2–1.0 Gm./Kg.) fed. Assuming that one molecule of the conjugated sulfate is formed from one molecule of sulfanilamide, then 6–12% of the dose of the drug gives rise to a hydroxy body, probably a phenol, which is excreted combined with sulfate.—JEAN SHELSWELL and R. TECWYN WILLIAMS. *Biochem. J.*, 34 (1940), 528. (F. J. S.)

22,23-Dibromostigmasterol Acetate. This compound, which melts at 201° to 203° C. with decomposition and is suitable for use in synthesizing sexual hormones, is obtained from 5,6,22,23-tetrabromostigmasterol acetate by reaction with sodium iodide, suitably by refluxing with benzene and alcohol.—MAX BOCKMÜHL, GUSTAV EHRHART, HEINRICH RUSCHIG and WALTER AUMÜLLER, assignors to WINTHROP CHEMICAL CO. U. S. pat. 2,203,611, June 4, 1940. (A. P.-C.)

Estrogenic Compounds. A process employed involves reducing dehydroneoergosterol to tetrahydrodehydroneoergosterol with a reducing agent capable of adding 4 hydrogen atoms to ring B of dehydroneoergosterol without affecting the phenolic ring thereof, converting the 3-hydroxyl group of the reduction product to a group resistant to oxidation and capable of hydrolysis to give hydroxyl, and oxidizing the thus-protected tetrahydroneoergos-

terol to an estrogenic compound.—RUSSELL E. MARKER and THOMAS S. OAKWOOD, assignors to PARKE DAVIS & CO. U. S. pat. 2,202,704, May 28, 1940. (A. P.-C.)

Estrone—Inactivation of. Estrogens may be metabolized by the body similarly to other phenols which are oxidized to *o*, or *p*-dihydric phenols. The same type of oxidation of phenols is brought about *in vitro* by H_2O_2, and *o*-dihydric phenols are also produced as the first step in the oxidation of monophenols by tyrosinase. Estrone was readily inactivated by H_2O_2 in alkaline solution but not in neutral solution; the methyl ether of estrone was not inactivated by H_2O_2 in alkaline solution. Estrone, estradiol and diethylstilbestrol were inactivated by incubation with tyrosinase; a boiled tyrosinase extract had no action. Incubation with catechol oxidase or a combination of catechol oxidase plus catechol did not produce any appreciable inactivation. Complete inactivation resulted from the addition of H_2O_2 but could be prevented by the simultaneous addition of catalase; however, the addition of catalase did not prevent the inactivation by tyrosinase.—W. W. WESTERFELD. *Biochem. J.*, 34 (1940), 51. (F. J. S.)

Female Hormone in Bituminous Coal from Shantung Province. The authors have analyzed eight samples of bituminous coal from different localities in Shantung province. Potency was found to vary from 200 R.U./Kg. to 40 R.U./Kg.—T. H. TANG, W. C. WANG and C. C. PENG. *Jour. A. Ph. A.*, 29 (1940), 302. (Z. M. C.)

Ferric Salts and Iron—Colorimetric Determination of, in Blood by Means of Gallic Acid. The authors found that ferric iron in amounts greater than 1 mg. may be treated with an aqueous solution saturated with gallic acid and sodium acetate to give a colored product in which the intensity of the color varied with the amount of iron present. The method is applied to the determination of iron in blood as follows: *Reagents.* (*a*) Saturated solution of gallic acid, prepared by dissolving 2 Gm. of pure gallic acid in 100 cc. of distilled water at 50–60° and then cooling the solution rapidly to 20–30°. (*b*) Saturated solution of sodium acetate, prepared by dissolving 30 Gm. of the salt in 100 cc. of hot distilled water and then cooling the solution. (*c*) Standard 1% solution of ferric chloride (p_H 5.8), prepared by dissolving 1 Gm. of pure iron in a mixture of hydrochloric acid and hydrogen peroxide solution (100 volumes) and evaporating the excess acid. *Method. Calcination.* Weigh 3–5 Gm. of blood rendered incoagulable by addition of ammonium oxalate or alkalinized with ammonia, evaporate carefully in a porcelain dish avoiding spattering. When the mass is dry, allow to cool; mix with 5–15 Gm. of ammonium nitrate, ignite in a muffle, then allow the residual ash to cool. *Solution of the ash.* Treat the residue with 2–3 cc. of hydrochloric acid and 3–5 cc. of hydrogen peroxide solution (100 volumes) added drop by drop, evaporate to a syrupy consistence to eliminate excess acid, cool, add a little water, evaporate again, and repeat until on addition of water a solution having a p_H of at least 5.8 is obtained. *Determination.* Adjust the volume to 5 cc., add 3 cc. of gallic acid solution and make up to 15 cc. with the sodium acetate solution. A control containing 2 cc. of the standard iron solution and 3 cc. of water is treated with the same quantities of the reagents at the same time as the sample. The colors obtained are compared. Let a equal the concentration of the control; a' the concentration of the sample; h the thickness of the layer in which the color of a is measured; and h' the corresponding thickness for a'; then $a' = a \times (h/h')$. The results obtained were always slightly higher than the theoretical values.—Y. VOLMAR and A. WAGNER. *J. pharm. chim.*, 30 (1939), 364–369. (S. W. G.)

Hawaiian Limpet (Opihi)—Chemical Analysis and Vitamin Assays of. The opihi, or Hawaiian limpet (*Helcioniscus exaratus* Nuttall and *H. argentatus* Sowerby), has been analyzed for moisture, protein, ether extract, total ash, calcium, phosphorus, iron, copper, silicon and glycogen. Separate analyses have been made of the solid portion (foot and mantle) and of the viscera. Moisture, protein, ether extract and total ash have been determined for the ovaries and for the testes. Opihi are a good dietary source of protein, calcium and iron. Experiments with anemic rats showed that the feeding of opihi, which are low in copper, did not result in any marked regeneration of hemoglobin until this mineral was added. Whole fresh opihi contain, per 100 Gm., approximate quantities of the vitamins as follows: 4000 International Units of vitamin A, 130 Sherman-Bourquin units of vitamin B_2 (G) (300 γ flavin), and 30 International Units of vitamin D. They contain little or no vitamin B_1 and are devoid of vitamin C. A study of the contents of the digestive tracts of the opihi showed that their food consists largely of blue-green and other algæ, and that diatoms, although present, are probably a relatively unimportant food source. Using spectrographic methods at the University of Hawaii, Nelson and Ballard have recently shown that the vitamin A activity of the hepato-pancreas of the opihi is due entirely to carotene. The absorption band of vitamin A could not be detected whereas the β-carotene bands were prominent.—CAREY D. MILLER and RUTH C. ROBBINS. *Philippine J. Sci.*, 71 (1940), 141. (P. A. F.)

Hemoglobin—Comparison of Methods of Determining. Gasometric methods and Wong's method (based on determination of total iron) gives entirely concordant results. Wong's technique is advisable for general work. Methods based on the colorimetry of hematin hydrochloride proved rather unsatisfactory.—A. MARENZI and E. LIDA. *Compt. rend. soc. biol.*, 129 (1938), 1267–1269; through *Chimie & Industrie*, 42 (1939), 33. (A. P.-C.)

Hemoglobin—Simple Optical Method for Determining, Without Colored Standard. The method can be applied very satisfactorily to the determination of oxyhemoglobin, as one of the absorption maximums of this substance ($\lambda = 541\mu$) coincides almost exactly with the green line of mercury (546μ). Add 20 cc. of blood to 2 cc. of water, shake, centrifuge and place the clear liquid in one of the cells of a Duboscq comparator illuminated with green mercury light. The other cell is filled with water and contains the neutral grey screen which is used as standard of optical density, D. The depth (x cm.) of liquid giving equal intensities in the two fields is determined, and the concentration, C, in Gm. per cc. is given by the formula: $C = 800I/Dx$, were 800 is the absorption coefficient of oxyhemoglobin for the wave-length used.—A. DOGNON. *Compt. rend. soc. biol.*, 129 (1938), 469–470; through *Chimie & Industrie*, 41 (1939), 1075. (A. P.-C.)

Heparin—Barium Salt of. The authors summarize their work as follows: (1) Various methods are described for the preparation of a crystalline barium salt of heparin. (2) Evidence is presented for the view that the barium salt, isolated from various tissues, is identical in properties and is a chemical compound. (3) By treatment with acidified methyl alcohol under varying conditions heparin yields a series of products of lower physiological activity, decrease in activity being accompanied by a decrease in sulfur content. Material completely inactivated in this way appears to have undergone structural alteration in addition to removal of the sulfate

groupings. (4) The structure of heparin is discussed. The results of investigations to date are best explained on the basis that it is a mucoitin sulfuric acid in which the basic tetrasaccharide unit contains five sulfuric ester groupings. Analyses of the barium salt and of the ammonium salt prepared from it are in agreement with this view. In the barium salt the carboxyl groups appear to be unsubstituted.—A. F. CHARLES and A. R. TODD. *Biochem. J.*, 34 (1940), 112. (F. J. S.)

Heparin—Some Factors Influencing the Anticoagulant Action of. Prolonged dialysis of plasma has little effect on the activity of heparin. Addition of sodium chloride to this plasma decreases the activity of the heparin. The results of Howell which indicated that heparin is only active in the presence of a protein in plasma are confirmed. The protein is found in the albumin fraction but is not crystalline serum albumin. These results are in agreement with Quick's view that heparin acts by combining with, and enhancing, the activity of the normal plasma antithrombin.—L. B. JAQUES and R. A. MUSTARD. *Biochem. J.*, 34 (1940), 153. (F. J. S.)

Hexamine-Insulin. By the treatment of a solution of insulin with solution of hexamine, a solution is obtained which may be rendered clear by acidification, as with phosphoric acid, and is suitable for therapeutic injections.—RAYMOND A. WARBURTON. U. S. pat. 2,202,325, May 28, 1940. (A. P.-C.)

Histidine Detection and Estimation in Urine. The author summarizes his work as follows: (1) The application of present colorimetric methods for histidine detection and their difficulties are described. (2) A simple and rapid quantitative method for histidine estimation in urine by a modification of Knoop's bromine reaction is given. (3) The specificity of the bromine test is discussed. (4) When this reaction is applied to normal urine a color is produced which corresponds to an average of 20 mg./100 cc. histidine monohydrochloride. The range of normal values lies between 2 mg./100 cc. and 80 mg./100 cc. (5) A higher excretion value in the urines of melancholic patients, as claimed by Schimmelpfeng, could not be confirmed. (6) Pregnancy urines usually show high histidine values when considered in relation to the urea excretion and to the specific gravity of the urine.—E. RACKER. *Biochem. J.*, 34 (1940), 89. (F. J. S.)

Hogben Test for the Biological Indication of Pregnancy. The injection of 1–2 cc. of concentrated pregnancy urine into the dorsal lymph sac of the female of the African spur frog, better known as claw frog (*Xenopus laevis* Daudin), causes a spontaneous ovulation within 12 hours at the longest. One may also use 1–2 cc. of a 15:1 or 20:1 water extract of an acetone extract of the urine. The p_H of the urine injected in either case should be on the acid side—about 5.5. The earliest signs of a positive reaction occur after about 5 hours. F. A. E. Crew, however, lists the following criteria: the failure of the frog to deposit eggs within 30 hours indicates a negative result; a dark red, somewhat swollen cloaca with possible egg deposition in an additional 24 hours is indicative of a questionable positive; fewer than 20 eggs signifies a very weak positive; 20 to 50 eggs, weak positive; 50 to 200 eggs, positive; more than 200 eggs, strongly positive. As a rule, the reaction is complete within 24 hours. The animals may be used again after 4 weeks in the event of a positive reaction, and at the end of 14 days in the case of a negative reaction. Ten references.—WOLFGANG LAVES. *Deut. Med. Wochschr.*, 66 (1940), 5–7. (L. K.)

Hormone Standards for International Use—Delivery of Two, by the League of Nations. After briefly reviewing the work of the League of Nations in providing hormone standards, the writer reports that the League has two new standards for delivery. These are the lactogenic hormone of the anterior lobe of the pituitary and the gonadotropic hormone from the urine of pregnant mares. Widely varied methods of assay were carried out on these substances in 12 commercial laboratories in four European countries and Canada. Thus the two standard preparations may be regarded as adequate, and the choice of the unit of activity without difficulties.—ANON. *Chinese Med. J.*, 57 (1940), 395–396. (W. T. S.)

Hormones—Separation of, from Biological Materials. Hormones, such as those of the anterior pituitary gland, are separated from other materials, including proteins, by agitation with water and an organic water-immiscible liquid, such as chloroform, to cause the formation of several layers, one of which is an aqueous solution containing the hormones.—MANASSEH G. SEVAG, assignor to SCHERING CORP. U. S. pat. 2,202,029, May 28, 1940. (A. P.-C.)

Insulin Reaction with Iodine—Influence of Zinc on. The variation in the duration of the blood sugar-lowering activity of the insoluble compounds formed by protamines with insulin at p_H 7, with the zinc content of the insulin used cannot be explained simply by the low solubility of the protamine insulin, since the solubility is not materially affected by increase in the zinc content. The hormone cannot exert its full activity apparently until the zinc has been split off from the molecule. The absorption of iodine by insulin has been studied to ascertain whether zinc exerts a protective action *in vitro*. The rate of absorption of iodine by ovalbumin, serum proteins, pepsin, peptone and pancreatin was not influenced by the presence of zinc but an amorphous (zinc-free) insulin absorbed iodine more rapidly in the absence of than in the presence of added zinc. Addition of the cations calcium, aluminum or lead did not affect the absorption rate. The presence of cadmium reduced the rate of absorption to a smaller extent than did zinc. The amount of iodine absorbed in five minutes at p_H 7.2 increased with the physiological activity of the insulin used and the zinc effect increased with the activity. Addition of zinc to a crystalline (zinc-containing) insulin did not alter the rate of iodine absorption. Since the amount of iodine absorbed is directly proportional to the physiological activity of samples of zinc-free or zinc-containing insulin, the iodine absorption is suggested as the basis of a chemical method for the assay of insulin or for the control of its industrial purification.—E. H. VOGELENZANG. *Rec. Trav. Chim. Pays-Bas*, 58 (1939), 201; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 626. (S. W. G.)

Lactic Dehydrogenase (Crystalline) from Heart Muscle. The enzyme which catalyzes the reduction of cozymase by lactic acid and the oxidation of reduced cozymase by pyruvic acid has been prepared in the crystalline form. This enzyme, together with the heart flavoprotein and cozymase, forms a complete system oxidizing lactic acid. Lactic and malic dehydrogenases are not identical.—F. B. STRAUB. *Biochem. J.*, 34 (1940), 483. (F. J. S.)

Lecithin—Constitution and Action of. A short review of the information on the formulas for various lecithins and their role in plants and animals is presented.—TH. VON SALIS and C. H. BUER. *Schweiz. Apoth.-Ztg.*, 77 (1939), 393–394. (M. F. W. D.)

Liver Glycogen Content—Regulation of, in Protein-Free Diet by Means of an Amino Acid

(*l*-Tyrosine). The surprisingly large reduction of liver glycogen in rats fed with a diet containing tyrosine is to be explained as a consequence of a regulation of the liver glycogen content because of the tyrosine. The glycogen may be formed from the carbohydrate of the diet or, perhaps, from the dietary fat, but not from the tyrosine. In animals fed a tyrosine-free diet, the liver glycogen content was 74% higher after 14 days and 63.8% higher after 17 days than in a corresponding group of animals fed on a diet containing tyrosine.—ADOLF BICKEL and ADOLF HAUG. *Deut. Med. Wochschr.*, 65 (1939), 53–56. (L. K.)

Melanophoric Hormone Inhibiting Factor—Appearance of a, During the Sexual Cycle in Female Rats. At the beginning of the sexual cycle in white rats, *i. e.*, during diestrus and proestrus, blood serum or plasma has little or no influence on the melanophoric hormone. In estrus, however, the blood has the power to inactivate the hormone. This inactivation can be shown also during metaestrus but disappears at the end of metaestrus. The inactivating substance can be obtained from the blood by extraction with 50% acetone. During the cycle, there cannot be shown any clear changes in the melanophore hormone content of the hypophysis. Treatment of both male and female animals with follicular hormone produces the following picture: blood plasma acquires the ability to inactivate the melanophore hormone; the content of the hypophysis in active hormone is lowered; there is no change in the quantity of the inactive hormone. It seems possible that this phenomenon during estrus is a secondary result called forth by the increased secretion of follicular hormone.—W. RODEWALD. *Deut. Med. Wochschr.*, 66 (1940), 238–240. (L. K.)

Nicotinic Acid—Synthesis of, by Rats. Determinations on the feces and urine of rats, receiving definite amounts of nicotinic acid, revealed that they are able to synthesize this product. Additions of this acid to the basal diet containing vitamin B_1 and flavin did not increase growth rate.—K. L. SHOURIE and M. SWAMINATHAN. *Indian J. Med. Research*, 27 (1940), 679–683. (W. T. S.)

Oxalic Acid—Metabolism of, in the Animal Body. A method for the estimation of oxalic acid in blood is described. The oxalic acid content of normal blood was found to lie between 0.4 and 0.6 mg. per 100 cc. of whole blood. Tissues do not form or destroy oxalic acid under the conditions described. At p_H 7.0 or higher a suspension of feces inoculated into a nutrient solution containing oxalate causes the destruction of oxalate on incubation at 37°. This was observed under both aerobic and anaerobic conditions. The action is probably due to a non-sporing organism. At p_H 2.4 a similar inoculation with somewhat longer incubation at 37° was found to give rise to oxalic acid.—H. H. BARBER and E. J. GALLIMORE. *Biochem. J.*, 34 (1940), 144. (F. J. S.)

Phosphoric Esterification. A new hypothesis on the mechanism of modifications in the structure and the degree of stability undergone by the zymohexoses in consequence of the phosphoric esterification is discussed.—C. ANTONIANI. *Biochim. terap. sper.*, 26 (1939), 49. (A. C. DeD.)

Plastein Formation by Papain and by Pepsin—Chemical Changes Involved in. It has been confirmed that free amino and carboxyl groups disappear during plastein formation from concentrated proteose by crystalline pepsin. Using papain, the changes are obscured by simultaneous hydrolysis. Enzymatic hydrolysis of the plasteins results in the liberation of free amino and carboxyl groups. Reactive "tyrosine" decreases during plastein formation by either enzyme. The same groups are liberated on enzymatic hydrolysis of the plasteins, in a manner analogous to that which takes place in the hydrolysis of typical proteins. It is concluded that in so far as the changes in amino, carboxyl and "tyrosine" groups are concerned, the plasteins are similar to typical proteins. It is further suggested that the phenolic hydroxyl groups of tyrosine play an essential role in the structure of the protein molecule. Benzaldehyde was found to have no effect on the formation of plastein from proteose by crystalline pepsin.—H. B. COLLIER. *Can. J. Research B*, 18 (1940), 272–280. (W. T. S.)

Porphyrins—Urinary Excretion of, in Chemical Workers. A considerable increase in urinary porphyrins can be demonstrated in workers (engaged in the manufacture or use of aromatic nitro- and aminobodies) who do not show any overt signs of toxicity. It is suggested that determinations of the amount of porphyrins so excreted may prove of value in detecting hypersensitiveness to aromatic nitro- and amino-bodies and in deciding when an affected worker may safely return to work.—C. RIMINGTON and M. W. GOLDBLATT. *Lancet*, 238 (1940), 73. (W. H. H.)

Prolactin—Studies with. In these studies the authors have tried to obtain, by the method of Lyons and Catchpole and by that of Riddle, Bates and Dykshorn, the active hormone of lactation of the anterior lobe of the hypophysis. They have also examined this substance in the different troubles of lactation. In support of these investigations the authors have reaffirmed the existence of prolactin in the anterior lobe of the hypophysis. With the aid of two extracts and in the normal case, they have been able to obtain a very abundant lactic secretion. On the contrary, subjects having a hypolactic condition arising from badly developed breasts have been able to obtain a favorable effect with this hormone. In the case where lactation has diminished due to a physical cause, prolactin has always exerted a protecting influence upon it.—L. HAZAY and I. SZANTO. *Orvosi Hetilap*, 10 (1939), 228; through *Presse méd.*, 92–93 (1939), 174. (W. H. H.)

Quinacrine—Erythroplasmatic Distribution of. One of the authors received a daily dose of 0.3 Gm. of quinacrine taken at noon for five days. The samples of blood were taken in the morning before eating, beginning the morning after the first dose, and analyzed immediately by the procedure described previously by the authors (*J. pharm. chim.*, 29 (1939), 577). Results for two series of treatments are tabulated giving the amounts of quinacrine per liter of total blood, in the cellular fraction, and in the plasmatic fraction. The quinacrine appeared in the blood after a period of two to three days; the concentration reached a maximum the day after the administration of the last dose of the medicinal; it disappeared in ten to twelve days, and was not influenced by repetition of the treatment in two weeks. The blood cells have a greater affinity for quinacrine than does the serum, the total amounts found for the two treatments are respectively as follows: blood cells 4.11, 3.45 mg. per liter; plasma 1.48, 1.43 mg. per liter. The ratio of the concentrations in the cells and plasma is roughly three to one. The authors believe that the affinity of quinacrine and the different fractions of the blood are related to the cell proteins and the plasma proteins which exist in a 4 to 1 ratio. Experiments *in vitro* with blood and quinacrine show a distribution between the blood cells and the plasma of 4 to 1, respectively, and the authors believe that the drug is fixed by the proteins present in the blood fractions.—C. LATASTE, M. E. FARINAUD and NGUYEN-VAN-LIEN. *J. pharm. chim.*, 30 (1939), 5–13. (S. W. G.)

Sodium Hexametaphosphate—Use of, as an Anticoagulant. Sodium hexametaphosphate, an effective agent in reducing Ca-ion concentration, was tested for its inhibiting effect on blood clotting. A concentration of 0.1 Gm. per 100 cc. delayed the clotting but did not prevent it. Higher concentration inhibited the clotting completely. The salt used in the preparation of Folin-Wu filtrates did not interfere with deproteinization.—CLARENCE E. LARSON. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 554. (A. E. M.)

Sterols. LXX. The Steroid Content of Mares Pregnancy Urine. Mares pregnancy urine has been found to differ from other urines in the proportion of the three pregnanediols present, allo-pregnanediol-3(β),20(α) being present in considerable amounts while only small amounts of pregnanediol-3(α),20(α) and allo-pregnanediol-3(α),20(α) are present. This is a direct opposite to the condition found in human pregnancy, cow pregnancy and bull urines.—R. E. MARKER and E. ROHRMANN. *J. Am. Chem. Soc.*, 61 (1939), 2537. (E. B. S.)

Sugar in Urine—Relation of Cuprous Creatinine to Tests for. Benedict's test, in distinction to other alkaline copper tests used for the qualitative detection of sugar, is more sensitive to urinary glucose solutions than to aqueous ones; the reverse being true of Fehling's and Trommer's tests. Creatinine is the opacity promoting or sensitizing factor in urine which causes bulky opacity in positive Benedict tests with low concentrations of glucose, probably due to the formation of a complex which is not soluble in the carbonate solution, but which dissolves in the alkali of Fehling's or Trommer's solutions.—M. SAMSON. *J. Am. Chem. Soc.*, 61 (1939), 2389. (E. B. S.)

Sulfanilamides and Other Primary Aromatic Amines—Estimation of, in Body Fluids. The author recommends the Werner method for determining free but not conjugated sulfanilamide. A modification of this method is proposed for use with patients showing normal or elevated blood urea. A new quantitative method, depending on diazotization and coupling, was developed for use with aromatic amines or compounds hydrolyzable thereto. Using these methods to analyze the sera of patients receiving M. & B. 693, it was found that the ratio between the free and total form of this compound varies widely in individuals. In rats, receiving a diet producing an alkaline urine, greater amounts of acetylated M. & B. 693 were excreted. The sera of humans and rabbits contained a greater concentration of free M. & B. 693 than did the whole blood, with some 20% to 50% being in the corpuscles. Contrarily, a higher concentration of sulfanilamide is found in the whole blood.—P. FANTL. *Australian J. Exp. Biol. Med. Sci.*, 18 (1940), 175–184. (W. T. S.)

Sulfapyridine—Excretion of. Sulfapyridine is excreted both free and combined in the urine of patients receiving the drug, the excretion continuing for several days after repeated doses. Including the amount present in the feces, probably due to non-absorption, about 90% may be recovered. The drug has also been recorded from the vomit after oral or intravenous administration, but oxidation products are not so easily formed as in the case of sulfanilamide.—G. V. JAMES. *Lancet*, 238 (1940), 25. (W. H. H.)

Alpha-Tocopherol and Related Substances—Prevention of Nutritional Muscular Dystrophy in Suckling E-Low Rats with. The dystrophy that almost invariably appears toward the end of the lactation period in the suckling young of vitamin E-low mothers can be prevented by the administration of 10 mg. of alpha-tocopherol to the mother on the day of littering or the feeding of 1 mg. daily to the young from day 10 or 3 mg. from day 15. The following compounds were found to be inactive: 2,2,5,7,8-pentamethyl-6-hydroxychromane, phytol, gamma lactone and vitamin K_1.—HERBERT M. EVANS and GLADYS A. EMERSON. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 636. (A. E. M.)

Alpha Tocopherol—Growth-Stimulating Activity of. Growth is stimulated in "plateaued" E-low female rats when their diet is supplemented by the daily administration of alpha tocopherol at 0.25 and 0.5 mg. levels. The growth corresponds approximately to that previously secured by daily feeding of 1 mg. alpha tocopherol.—MARJORIE M. NELSON, GLADYS A. EMERSON and HERBERT M. EVANS. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 157. (A. E M.)

Traumatic Acid and Thiamine as Growth Factors for Algæ. The author refers to conflicting reports concerning the plant-growth activities of so-called plant hormones. The experiments of the author showed that traumatic acid (1-decene-1,10-dicarboxylic acid), a wound hormone of plants, definitely promoted multiplication of the cultures of certain algæ treated in a purely inorganic medium. Thiamine recognized as a growth factor for fungi and higher plants, proved far less effective for the same algæ, but was superior to traumatic acid in promoting the growth of *Sphaerella lacustris*. No algæ were found which responded to adenine a factor for leaf growth.—J. VAN OVERBEEK. *Proc. Nat. Acad. Sci. U. S.*, 26 (1940), 441–443. (W. T. S.)

***l*-Tyrosine—Presence of, in Alcoholic Extract of Egg Yolk.** The liquid decanted from the residue from the distillation, under reduced pressure, of the alcoholic extract of lecithin and lutein deposits, on standing, white flocks (0.05–0.08 Gm. per 100 Gm. of egg yolk). The flocks of microscopic needles were identified by reactions and analysis as *l*-tyrosine.—L. BRACALONI. *J. pharm. chim.*, 1 (1940), 140–142. (S. W. G.)

Tyrosine, Tryptophane and Cystine—Photometric Determination of. The Folin and Marenzi method has been modified by using a Pulfrich photometer instead of a colorimeter. Owing to the constancy of the absorption ratios within the limits of experimental error the use of standard solutions can be discarded.—P. BALINT. *Biochem. Z.*, 299 (1938), 133–136; through *Chimie & Industrie*, 41 (1939), 1073. (A. P.-C.)

Vitamin A Content of Liver and Deposit Fats of Some Indian Fish. At present most of the fish oils from India's inexhaustible fish supply is used as lubricants. The liver and deposit fats of 16 different species, from marine and fresh-water, have been assayed for vitamin A by spectrophotometric and tintometric methods. Ether extraction, cooking and oven drying were the methods used for preparing the oils. The two latter methods caused a 20% to 60% loss in vitamin A content. The liver oils ranged from 5 to 30 times higher in vitamin A content than commercial cod liver oils. The oils from fats deposited near the liver contained practically no vitamin A or carotene. The vitamin A content of the oils was high in the growth season and low during spawning. In agreement with previous reports, it was found that the oil from the fresh-water fish shows an absorption band with a longer wavelength than does the oil from marine fish.—P. K. SESHAN. *Indian J. Med. Research*, 27 (1940), 711–720. (W. T. S.)

Vitamin A Content of Some Species of Bengal Fish. The liver and body oils extracted by ether from several species of Bengal fish, were assayed for vitamin A by biological, tintometric and spectro-

scopic methods. While the body oils contained little or no vitamin A the liver oils were potent sources. None of the oils from the liver of the fresh-water fish showed an absorption band at 345 to 350 mμ, characteristic of vitamin A_2.—K. P. BASU, B. C. RAI SIRCAR and J. C. SEN GUPTA. *Indian J. Med. Research*, 27 (1940), 721–729. (W. T. S.)

Vitamin A Deficiency—Dark Adaption Test for. An account is given of experiments (carried out in the winter of 1937) to reinvestigate the reliability of dark adaption tests for detecting deficiency of vitamin A. The Birch-Hirschfeld photometer was used, with several improvements in technique—e. g., a large screen was used for "bleaching," and during the test the patient's attention was kept directed to the position of the quincunx. Two precautions were taken, which are considered essential as a check to control the procedure. Each subject was re-examined repeatedly, and the initial value not accepted until it had been found to be relatively constant on successive occasions (to ascertain individual variations and to rule out the possibility of further improvement with practice). Secondly, to check the specificity of the result, subjects found to be subnormal were divided into two groups, half being treated with the vitamin and the other half kept as controls. The criterion accepted for subnormal dark-adaptation in these tests was a diaphragm reading of 6 or over (with wedge set at 5) after 10 minutes in the dark; the reading immediately after the "bleaching" was considered of less value, mainly because of its rapid rate of change. Control tests indicate that under the ordinary working conditions of the authors' experiments, previous exposure to light had no influence on the results. Among middle-class adults cases of lowered dark-adaptation seemed relatively rare, and readings were not improved beyond the usual normal by treatment with vitamin A. It is concluded that the theoretical basis of the test is reliable, although the apparatus and technique are capable of being further improved. In view of the variable results obtained by other workers using different methods, additional study is to be desired. The dark-adaptation test is only capable of detecting deficiency and not of assessing different levels of normality (*cf.* urine "saturation" tests for vitamins B_1 and C_1). Since the test is relatively intricate and needs experience and careful controlling it is not suitable for rapid routine use by school medical officers. It can have its application in surveys on small selected samples of population to confirm the supposition of deficient dietary intakes or for diagnosis in the clinic. Deficiency seems less common among adults than in children.—L. J. HARRIS and M. A. ABBASY. *Lancet*, 237 (1939), 1355. (W. H. H.)

Vitamin B—Chemical Characteristics of. The hydrochloride of the antineuritic vitamin called aneurin, may be derived from rice polishings. It has been synthesized, the synthetic form having a physiologic activity equal to the natural vitamin. It has adsorbability, and is soluble in water and alcohol but not in ether, chloroform nor acetone. It is not thermostable in an alkaline medium. It can be identified by various colorimetric tests, which can be used for urine plasma and cerebrospinal fluid. It may also be determined by alcoholic fermentation.—C. H. LIBERALLI. *Rev. quím. Farm.*, 4 (1939), 71. (G. S. G.)

Vitamin B Complex. A review with fifty-four references.—M. A. LESSER. *Drug and Cosmetic Ind.*, 47 (1940), 141–144, 146, 151. (H. M. B.)

Vitamin B Components—Recovery of, from Fermentation Residues. A fermentation residue such as that obtained in the fermentation of molasses with butyl alcohol-reducing bacteria is used as a source of vitamin G for preparing animal feeds. Various examples with details are given.—CARL S. MINER, assignor to COMMERCIAL SOLVENTS CORP. U. S. pat. 2,202,161, May 28, 1940. (A. P.-C.)

Vitamin B_1—Clinical Experiences with Measurements of the Urinary Excretion of. It appears possible to correlate the urinary excretion of vitamin B_1 with the state of nutrition in vitamin B_1 in man using a thiochrome method for determining the amount excreted in the urine.—GEORGE A. CARDEN, WILLIAM D. PROVINCE and JOSEPH W. FERREBEE. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 1. (A. E. M.)

Vitamin B_1 Deficiency—Symptoms of. Thirty-seven reports on beriberi and other symptoms of a vitamin B-deficient diet are reviewed.—EDWARD B. VEDDER. *Am. J. Trop. Med.*, 20 (1940), 625–640. (W. T. S.)

Vitamin B_1—Natural Sources of, in Peru. The general sources of vitamin B_1 are rice polishings, certain vegetable oils and yeast. Those available in Peru are rice and peanut oil. Ten grams of rice polishings and 16 Gm. of fresh peanuts daily are sufficient for the most severe case. Rice polishings have a high vitamin content and, except that they may be attacked by heat and alkalies, they are stable. Three neuritic diseases are endemic in Peru, and are susceptible of improvement by vitamin B_1. They are beriberi, Carrion's disease and leprosy. Peru uses quantities of imported vitamin B_1. Polishings salvaged from the rice mills of which Peru has great numbers, may be substituted as efficaciously and at a cost 4 to 10 times cheaper than the import. More study of this subject is planned.—HUGO PESCE. *Reforma Medica*, 25 (1939), 529. (G. S. G.)

Vitamin B_1—Study on the Absorption and Elimination of. Supplementary thiamin injected or ingested does not lead to a corresponding excretion of this material. The authors have studied this problem by injecting thiamin containing radioactive S and then following its excretion in the urine and feces along with a total of free vitamin B_1 in the urine. The method used was outlined. Injected thiamin must rapidly interact with that preëxisting in the tissues since injections of radiothiamin increased the elimination of thiamin in an individual receiving a normal diet. Injections of radiothiamin in a subject on a vitamin B_1-free diet gave an increase of ordinary vitamin B_1 but no radiothiamin in the urine which shows injected vitamin B_1 rapidly enters the tissues from the blood. Also significant, but not necessarily adequate, amounts remained in the tissues for thirty-six days after the subject was placed on a vitamin B_1-free diet. The interchange and destruction of vitamin B_1 is rapid, yielding in the urine inorganic sulfates and neutral S compounds.—HENRY BORSOOK, EDWIN R. BUCHMAN, JOHN B. HATCHER, DON M. YOST and EDWIN MACMILLAN. *Proc. Nat. Acad. Sci.*, 26 (1940), 412–418. (W. T. S.)

Vitamin B_1—Value of the Urinary Excretion of, as a Diagnostic Test. The authors state that an accurate method has been evolved by Melnick and Field for the determination of thiamin in the urine. To establish the value of this test as a criterion of vitamin B_1 nutrition, 89 patients were studied and the urinary excretion of thiamin was correlated to the diet for a period of several months previous. There was a good correlation between the urinary thiamin values and the adequacy of the diet with respect to this substance. In patients whose diet had been adequate, 90 micrograms of thiamin were excreted in 24 hours in males and 60 micrograms in females. In those who had previously been consuming a diet inadequate in thiamin, the

urinary excretion in 24 hours was 66 micrograms or below in males and 43 micrograms or below in females. Patients whose diet had previously been adequate excreted over 7.5% of an oral test dose of 5 mg. of thiamin whereas those whose diet had been inadequate excreted less than 7% of this dose.—W. D. ROBINSON, D. MELNICK and H. FIELD. *J. Clin. Invest.*, 19 (1940), 399; through *Abbott Abstract Service*, (1940), No. 678. (F. J. S.)

Vitamin C Dosage in Feminine Athletic Students. The influence of high doses of vitamin C on the athletic performing ability of 44 feminine athletic students was investigated. In some cases, there was an increase in ability to perform. In all cases, sleep was improved; and in the majority, there was an improvement in appetite.—H. WIEBEL. *Deut. Med. Wochschr.*, 65 (1939), 60. (L. K.)

Vitamin C Hypovitaminosis—Method for Detection of. A discussion and description.—ANDREAS GÓTH. *Deut. Med. Wochschr.*, 65 (1939), 718. (L. K.)

Vitamin C Requirements of Humans. A discussion.—HANS MOHR. *Deut. Med. Wochschr.*, 65 (1939), 552–554. (L. K.)

Vitamin D Assay—Error of, by Ash Content of Bone Method. The following conclusions are given: The dosage response relation for the assay of vitamin D by the percentage ash content of bone test in rat method has been examined. It has been shown that: (1) The dosage response relation is linear, when the response is given as the percentage ash content in bones and that is compared with the log of the dose. (2) The slope of the linear dosage response reaction is significantly greater for animals receiving the unknown preparation, butter, than for animals receiving the standard preparation. For the same preparation the slopes appear to remain constant from experiment to experiment. (3) The effect of these slope differences on the potency ratios may, however, for practical purposes be neglected, and without any marked loss of accuracy a common slope may be assumed. (4) For a 20-rat experiment the limits of error ($P = 0.99$) were found to be 66 and 152%.—E. A. G. SHRIMPTON. *Quart. J. Pharm. Pharmacol.*, 13 (1940), 97–108. (S. W. G.)

Vitamin D—Determination of, in Food Substances Containing Phosphorus. The only practical method of determining the vitamin D content of the food substance which contains enough phosphorus in the dose tested to alter the Ca:P ratio of the diet given is to extract the ether soluble portion after saponification and determine the vitamin D content of the extract.—KATHARINE H. COWARD and ELSIE W. KASSNER. *Biochem. J.*, 34 (1940), 538. (F. J. S.)

Vitamin E Concentrate. A process of producing a solid, stable vitamin E concentrate and antioxidant from wheat germ oil and in which the original vitamin E activity of the wheat germ oil has been increased from 20 to 50 fold comprises introducing a catalyst into wheat germ oil, and hydrogenating the oil in the presence of the catalyst, while agitating the oil and heating the oil and catalyst to a temperature of not more than 200° C. whereby the oil is partially hydrogenated and a portion of the glycerides present in such oil are converted from the unsaturated state to the saturated state, filtering the warm oil to remove the catalyst therefrom, extracting the hydrogenated wheat germ oil with alcohol to produce an alcoholic extract containing vitamin E and antioxidant, then cooling the alcoholic extract to a sufficiently low temperature to cause the separation of sterols and glycerides therefrom, then filtering the solution while cold to remove the sterols and glycerides, and finally removing excess alcohol from the vitamin concentrate by distilling off the alcohol.—JOHN S. ANDREWS, assignor to GENERAL MILLS, INC. U. S. pat. 2,203,400, June 4, 1940. (A. P.-C.)

Vitamin E (Tocopherol)—Effect of Ingested, on Vitamin A Storage in Liver of Albino Rat. The author was unable to demonstrate any effect in vitamin A storage from vitamin E intake when this is at prophylactic or even at curative levels. He carried out further experiments in which larger doses of vitamin E were administered, and reached the following conclusions. There was a suggestion, especially from the male group, that vitamin E may simultaneously affect the liver's content of vitamin A and its gross weight, although the latter is more influenced by body weight, which under the experimental conditions was not appreciably affected by vitamin E intake. Correlation of other variables, such as body weight and food intake, with vitamin A storage is hardly likely to exist, because no significant differences were found in body weights or food intakes of the animals without and those with administered vitamin E. On the other hand, there appears to be a predominating influence of sex, which results in the males eating more, gaining more weight, developing larger livers and storing more vitamin A in their livers than do comparable females, whether they did or did not receive vitamin E. The findings of Moore, to the effect that vitamin E intake affects the storage of vitamin A in the liver of the albino rat, in the sense that animals receiving no vitamin E at all for the first fourteen weeks of life store less than matched animals receiving a relatively massive dose of tocopherol, were confirmed. The same phenomenon was observed in both sexes. With more nearly normal doses of tocopherol, however, no effect could be established. The amounts of vitamin A stored in the livers both of deficient animals and of those receiving superabundant vitamin E appears to be unrelated to body weight or food intake since neither of these differed significantly as between deficient and supplemented animals. The part played by liver weight is, however, more difficult to decide. It differed significantly between males and females, but not between deficient and supplemented animals, although it showed a correlation with another variable—vitamin A storage, which was itself markedly influenced by the presence or absence of vitamin E.—A. L. BACHARACH. *Quart. J. Pharm. Pharmacol.*, 13 (1940), 138–149. (S. W. G.)

Vitamin K—Absorption of Water-Soluble, from Intestinal Tract. When fat-soluble forms of vitamin K are administered to man, the danger always exists that the dose of bile salts will not be adequate in amount or that the bile salt may not mingle properly with the vitamin following dissolution of the capsules. The oral administration of water-soluble vitamin K will eliminate this problem. It will also avoid nausea and vomiting caused by the bile supplements.—E. D. WARNER and JOSEPH E. FLYNN. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 607. (A. E. M.)

Vitamin K—Clinical and Experimental Studies on. A bleeding tendency appears during and after operation on patients with biliary fistulas or obstructive jaundice. It occurs without known trauma, due to abnormal lowering of plasma prothrombin and can be relieved by vitamin K therapy. Studies began in 1930, in Copenhagen, with work on chicks. The vitamin was named K because of the Danish word "koagulate." This vitamin occurs in large quantities in alfalfa, kale, and spinach. It is colorless, and can be produced by bacterial action in the lower intestine. The vitamin is isolated in the form of an oil, but its chemical composition is not yet known. It is not yet known if vitamin K enters into the

chemical composition of prothrombin, or merely keeps the tissues in a normal healthy state of activity essential for the formation of prothrombin. Faulty absorption occurs when bile is excluded from the intestine, because without bile or bile salts vitamin K cannot be absorbed. Vitamin K is extracted from alfalfa meal by lead-free high test gasoline. The gasoline is removed by distillation, and the crude vitamin is emulsified in bile or a 2% solution of bile salt. It is important to standardize the methods of assay. Bile or bile salt must be fed along with the vitamin to assure absorption. It is of no use in thrombocytopenic purpura or hemophilia, since these are not due to vitamin K deficiency.—H. P. SMITH. *J. Am. Med. Assoc.*, 113 (1939), 380. (G. S. G.)

Vitamin K Potencies of Synthetic Compounds. In view of the failure of the absorption of many patients in which vitamin K therapy is highly desirable, there have been examined various compounds which could be administered intravenously in aqueous solution. The most active compound found is 1,4-dihydroxy-2-methylnaphthalene which has a potency of approximately 1000 Thayer-Doisy units per milligram. It is suggested that 2-methyl-1,4-naphthoquinone should be adopted as a basic standard for the assay of vitamin K.—S. A. THAYER, S. B. BINKLEY, D. W. MACCORQUODALE, E. A. DOISY, A. D. EMMETT, R. A. BROWN and O. D. BIRD. *J. Am. Chem. Soc.*, 61 (1939), 2563. (E. B. S.)

Vitamin K_1 and 2-Methyl-1,4-Naphthoquinone—Potencies of. The highest ratio of potencies of the two compounds found was about 3:1, the lowest 2:1, vitamin K_1 being of lower potency.—SIDNEY A. THAYER, R. W. MCKEE, S. B. BINKLEY and EDWARD A. DOISY. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 585. (A. E. M.)

Vitamin K_1—Identity of Synthetic 2-Methyl-3-Phytyl-1,4-Naphthoquinone and. Analytical and physiological comparisons of natural vitamin K_1 and the synthetic 2-methyl-3-phytyl-1,4-naphthoquinone have established their identity. The tests are presented.—L. F. FIESER. *J. Am. Chem. Soc.*, 61 (1939), 2561. (E. B. S.)

Vitamin K_1—Synthetic Approach to. A number of methods of producing vitamin K_1 synthetically have been investigated and the results and conclusions therefrom are presented.—L. F. FIESER, W. P. CAMPBELL, E. M. FRY and M. D. GATES, JR. *J. Am. Chem. Soc.*, 61 (1939), 2559. (E. B. S.)

Vitamin Concentrates from Extracts of Rice Polishings, Etc. A process of preparing a vitamin-bearing concentrate in which factors of the vitamin B-complex other than vitamin B_1 and G (flavin) are primarily concentrated comprises extracting source material with an aqueous solvent, rejecting the solids therefrom, treating the solution with a siliceous adsorbent whereby quantities of vitamins G and B_1 are adsorbed, separating the vitamin-containing absorbent, evaporating the solvent from the remaining aqueous solution, extracting the evaporation residue with an alcohol, acetone or ethanol-acetic acid, rejecting the solids therefrom, evaporating the solution remaining, making an aqueous solution with a nonalkaline activated carbon whereby the greater part of the desired vitamin factors are adsorbed, separating the carbon from the aqueous solution, and eluting the vitamin in concentrated form from the carbon at an elevated temperature with an alcohol, benzene-alcohol or acetone. Various details of procedure are described.—LELA E. BOOHER. U. S. pat. 2,202,307, May 28, 1940. (A. P.-C.)

Vitamin Therapeutic and Alimentary Preparations. *2,195,595*—Preparations comprising fatty materials such as cacao butter together with a fish-liver oil, irradiated ergosterol or other vitamin admixture, are stabilized against loss of potency by the addition of a small proportion of an alkaline or antacid substance such as sodium carbonate or magnesia. *2,195,596*—Relates to vitaminic tablets containing a solid solution of a fat-soluble vitamin material in a solid fatty material together with a calcium compound such as calcium gluconate, other calcium salts also being usable, among them the secondary and tertiary phosphates, lactate, lactophosphate, sulfate, carbonate, citrate, galactonate, mucate, sorbate, ascorbate, tartrate, levulinate, mannonate, malate, saccharate, hypophosphite and glycerophosphate.—FERDINAND W. NITARDY, assignor to E. R. SQUIBB & SONS. U. S. pats. Nos. 2,195,595 and 2,195,596, April 2, 1940. (A. P.-C.)

Vitaminic Fish Oils, Etc.—Vacuum Distillation of. *2,199,994*—Oils such as pollak-liver oil, soy bean oil or rancid coconut oil are subjected to a process of vacuum distillation which comprises heating a thin film of the substance which is to be distilled and condensing vaporized molecules upon a condensing surface which is separated from the thin film by substantially free unobstructed space, maintaining the pressure of residual noncondensed gas in the space between the film and the condensing surface at less than about 1 mm. of mercury by means of vacuum pumps, overheating the distilling substance so as to yield a vapor stream of the desired distillate having a vapor pressure of between 0.001 and 1 mm. of mercury so that the molecules of vapor travel more than five times the mean free path in passing from the vaporizing film to the condensing surface, maintaining the residual noncondensed gas pressure lower than the pressure of the distilling vapors during the distillation, and limiting the time of exposure to heat in accordance with the overheating. *2,199,995*—A vitamin concentrate is prepared from an oil such as pollak-liver oil, containing fat-soluble vitamins including vitamin A esters of free fatty acids, by a process which involves neutralizing the free fatty acids (suitably with aqueous sodium hydroxide solution) without causing substantial saponification of the oil, separating the oil from the neutralized acids and subjecting the oil to a high-vacuum distillation and recovering a distillate fraction containing a vitamin.—KENNETH C. D. HICKMAN, assignor to DISTILLATION PRODUCTS, INC. U. S. pats. 2,199,994 and 2,199,995, May 7, 1940. (A. P.-C.)

Vitamins B and C—Is Diabetes Subject to the Influence of? By addition of vitamins B and C to the diets of diabetics, sugar in the blood and in the urine was diminished and acetonuria was decreased. Insulin dosage was lessened. The vitamin action was equivalent to approximately 20 units of insulin. Previous to the experiment, the patients did not show a deficiency in either vitamin B or C. However, inasmuch as the need for vitamin B depends on the extent of the carbohydrate content of the body, and inasmuch as the sugar content in diabetics is high, there is possibly a relative vitamin B deficiency. Vitamin B quickens the catalytic processes in carbohydrate metabolism, the hydrogenation of lactic acid, and the disposal of pyroracemic acid. It is possible that the lowering of the blood sugar by vitamin B depends on its removal of metabolic acidosis, without direct action on the pancreas. Therefore, the diet of diabetics should be rich in Vitamins B and C.—C. DIENST, DIEMER and SCHEER. *Deut. Med. Wochschr.*, 65 (1939), 710–715. (L. K.)

Vitamins—Biochemistry of the. The author summarizes our present knowledge of vitamins.—T. CESSI. *Biochem. terap. sper.*, 28 (1940), 212. (A. C. DeD.)

ANALYTICAL CHEMISTRY

Acridines—Volumetric Determination of, by Means of Methylene Blue. *Reagents.* Dissolve 2.29 Gm. of chemically pure picric acid in water and dilute to 1 liter to prepare $N/100$ picric acid. $N/1000$ picric acid is prepared by dilution. $N/1000$ methylene blue: Dissolve 3.8 Gm. of chemically pure methylene blue in water containing about 3 cc. of chloroform and dilute to 1 liter to make an approximately $N/100$ solution; $N/1000$ solution is prepared by dilution and is standardized against $N/1000$ picric acid as described below. *Procedure.* (*a*) *Diaminoacridine* (*base*). Approximately 0.1 Gm. is accurately weighed and dissolved with about 30 cc. of 0.5% acetic acid in a 200-cc. graduated flask. A measured excess of $N/100$ picric acid is added (theoretical requirement for 0.1 Gm. being 47.85 cc. of $N/100$ picric acid) and adjusted to 200 cc. with water. After mixing well the solution is kept for an hour (or longer) in a refrigerator. An aliquot part of the filtrate (20 cc.) is transferred to a separating funnel containing chloroform and some calcium carbonate. The titration of the excess of picric acid in the filtrate is carried out with exact adherence to the original method of Bolliger, namely, aqueous methylene blue solution of known strength (approximately $N/1000$) is run in from a burette and the methylene blue picrate formed is extracted from the aqueous layer by shaking with the chloroform present. The chloroform layer, which separates out very rapidly, assumes a green color while the yellow color of the aqueous layer diminishes in proportion. Continuing the titration the chloroform is renewed when it is saturated with methylene blue picrate or when the aqueous layer has assumed a green tint. In the latter case the aqueous layer, after extracting with fresh chloroform, reverts to yellow. When the yellow coloration of the aqueous layer has become considerably paler the methylene blue is added drop by drop and the chloroform is frequently renewed. Theoretically, the endpoint is reached when the aqueous layer has become completely colorless and when no more methylene blue picrate can be extracted from the aqueous layer. For practical purposes, however, the endpoint is considered to be reached only when one drop of methylene blue changes the almost colorless solution to a faint but distinct blue which completely resists further extraction with fresh chloroform. If for any reason the endpoint has been overstepped it is permissible to titrate back with $N/1000$ picric acid. (*b*) *2:8-Diaminoacridine sulfate* (*Proflavine B.P.C.*). The sample (approximately 0.1 to 0.2 Gm.) is dissolved in water, otherwise the procedure is the same as that described for the base. The theoretical requirement for 0.1 Gm. is 32.56 cc. of $N/100$ picric acid. It is advisable, however, to keep the reaction mixture in the refrigerator for four hours or longer in order to get complete precipitation. For combined determinations of base and sulfate the sample of proflavine, dried at 125°, is weighed accurately (0.3 Gm.), dissolved in approximately $N/10$ hot hydrochloric acid (80 cc.) and the sulfate is determined gravimetrically with 10% barium chloride (6 cc.) in the usual manner. Filtrate and washings are then collected in a 500-cc. volumetric flask. After adding sufficient calcium carbonate to neutralize the hydrochloric acid $0.01N$ picric acid (150 cc.) is added and the volume made up to 500 cc. After allowing to stand for several hours in the refrigerator the precipitated diaminoacridine picrate is filtered off and the filtrate is treated in the same manner as described for the determination of diaminoacridine. (*c*) *2:8-Diamino-10-methylacridinium chloride.* The technique is the same as that described for proflavine. However, after the addition of a measured excess of $N/100$ picric acid (theoretical requirement for 0.1 Gm. is 38.46 cc. of $N/100$ picric acid) an orange precipitate of amorphous appearance is obtained in contrast to the yellow crystalline precipitate of 2:8-diaminoacricine picrate. (*d*) The determination of mixtures containing varying proportions of the hydrochlorides of diaminoacridine and diaminomethylacridinium (*e. g.* Acriflavine B.P.) is discussed. The "total flavine" content can be determined by adding picric acid to a solution and titrating the excess picric acid. The monopicrates of these therapeutically important "flavines" have been isolated and analyzed and are here described for the first time.—A. BOLLIGER. *Quart. J. Pharm. Pharmacol.*, 13 (1940), 1–6. (S. W. G.)

Alcohol—Microdetermination of, in Pharmaceutical Products. Determination of the Chromic Value. *Reagent.* Dissolve 3.3852 Gm. of Potassium dichromate in distilled water to make 1000 cc. of solution. One cc. is equivalent to 0.001 mg. of alcohol. *Indicator.* To 1 cc. of a solution of methylene blue (0.05 Gm. in 75 cc. of water and 25 cc. of glycerol) add 3 drops of 10% solution of sodium thiosulfate and 10 drops of 1% sulfuric acid, shake well and let stand until the color disappears (about one hour). The reagent holds up for several days when kept in a dark place. *Method.* Transfer 1 cc. of the diluted alcoholic solution to a tube and add 1.5 cc. of sulfuric acid. Add the dichromate solution, by means of a microburette, at the rate of one drop per minute until a drop of the mixture removed with a drawn-out rod gives a persistent blue color when mixed with a drop of the indicator on a spot plate. The following conclusions are given: (1) The microdetermination of ethyl alcohol in pharmaceuticals may be carried out easily by the method given. (2) If the dichromate oxidation is carried out without preliminary treatment of the preparation the value is that for all the active substances present and is called the "total chromic oxidation value." (3) If the reaction is carried out on the distillate from the preparation the result represents the alcohol and other volatile substances and is called the "partial chromic oxidation value." (4) If the reaction is carried out on a distillate obtained from an acid and basic medium the "alcoholic chromic oxidation value" is obtained. This represents the dichromate used to oxidize only the alcohol present in the original preparation. This value will be influenced only by oxidizable substances that are not fixed by acid or alkali. (5) These values constitute a "constant" for each of the pharmaceuticals and indicate the quality of the product as well as the alcoholic content. (6) Only 1 cc. of the preparation is required for the dilution and distillations. (7) The method of Nicloux (*Bull. soc. chim. biol.*, 13 (1931), 861) utilizing the dichromate oxidation principle also gives good results, but the use of the indicator gives a sharper end-point. (8) The physical methods give good results, but they require at least 25 cc. of sample.—A. IONESCO MATIU, C. POPESCO and O. CONSTANTINESCO. *J. pharm. chim.*, 30 (1939), 252–263. (S. W. G.)

Alcoholic Compounds—New Method of Quantitative Separation of. The material is first chloroacetylated by heating for 3 or 4 hours on the boiling water bath with at least 10% of chloroacetic anhydride dissolved in its own weight of pure dioxane. To eliminate the excess of chloroacetic anhydride and the chloroacetic acid formed the reaction mixture is dissolved in ether and the solution is washed first with an equal volume of water, and then 2 or 3 times with a solution of sodium bicarbonate. The crude chloroacetylated product is dissolved in its own weight of dioxane, 10% to 20% of pure triethylamine is added, and the hermetically sealed flask is heated for 1 to 2 hours on the water bath at 100° C.

The contents of the flask are taken up successively with ether and with water containing 10% to 20% acetic acid by volume. The combined acid solutions are extracted once with ether, and contain all the alcoholic compounds in the form of ammonium ester chlorides.—G. SANDULESCO and A. GIRARD. *Compt. rend.*, 207 (1938), 874–876; through *Chimie & Industrie*, 41 (1939), 1074. (A. P.-C.)

Aluminum—Determination of, with 8-Hydroxyquinoline in the Presence of Iron and Phosphoric Acid. The results obtained with the use of an excess of sodium hydroxide for the separation of aluminum from iron are usually low as a result of absorption of aluminum by the hydrated iron precipitate. The following procedure is recommended: From an aliquot part of a solution containing ferric ions, aluminum ions and phosphoric acid, the iron can be determined volumetrically. The phosphoric acid may be determined in a second aliquot by a molybdate method. To a third aliquot add sodium monohydrogen phosphate solution until the desired ratio is obtained, make the solution basic with sodium hydroxide and after all the iron is precipitated, add 5 cc. of $2N$ sodium hydroxide in excess. Heat slowly to boiling, filter, wash with diluted sodium hydroxide solution and use the filtrate for the aluminum determination. Make the solution slightly acid to phenolphthalein, heat until the turbidity disappears, add 3% oxine solution and filter off the aluminum hydroxyquinoline compound. Dissolve the precipitate in $3N$ hydrochloric acid and determine the amount of bromine used up in the reaction with potassium bromide-bromate solution. One mole of aluminum oxide is equivalent to 8 atoms of bromine. The addition of the sodium phosphate reduced the error from a maximum of 6.66% to a minimum of 0.95%.—G. BALANESCU and M. D. MOTZOC. *Z. anal. Chem.*, 118 (1939), 18–26. (S. W. G.)

Ammonia—Final Titration of, in the Micro-Kjeldahl Method. The ammonia collected in standard hydrochloric acid is titrated with seventieth-normal sodium hydroxide in presence of methyl red. In order to get a sharp canary yellow end-point the titration must be completed in the cold. The following technique is recommended: heat the distillate to 80° to 90° C., add the standard alkali to the beginning of the end-point, boil a few seconds to remove carbon dioxide, cool immediately under cold water and finish the titration.—M. NICLOUX, *Compt. rend. soc. biol.*, 129 (1938), 1171–1173; through *Chimie & Industrie*, 42 (1939), 32. (A. P.-C.)

Ammoniated Glycyrrhizin—Monograph for. A monograph is presented.—KARL B. ROSEN. *Bull. Natl. Formulary Committee*, 8 (1940), 385–387. (H. M. B.)

Antimony and Arsenic—New Technique for Determining. When it is heated with an excess of H_2SO_4, the trivalent forms are oxidized to the pentavalent forms.—JUVENAL A. TORO. *Rev. Brasil. Chim. S. Paulo*, (June 1938), 265; through *Rev. soc. brasil. quím.*, 8 (1939), 81. (G. S. G.)

Antimony—Gravimetric Determination of, with 8-Hydroxyquinoline. The oxine reagent will detect 12 micrograms of antimony in 5 cc. of a solution of antimony chloride or of tartar emetic. The precipitation is quantitative at p_H 6–7.5. Prepare the reagent by dissolving 7–8 Gm. of oxine in as little glacial acetic acid as possible, dilute with 200 cc. of water, add $6N$ ammonium hydroxide solution until a slight turbidity remains, then clear the solution with a drop of acetic acid. Add 30 cc. of the oxine reagent to the antimony solution containing 0.5–1.5 Gm. of antimony and an excess of hydrochloric acid, heat to 60–70° and neutralize slowly with 10% ammonium hydroxide solution. At p_H 1.5 a yellow precipitate begins to form and precipitation is complete near the neutral point when the solution is strongly yellow. Continue the heating while giving the beaker a rotary motion in order to collect the precipitate at the bottom of the beaker. If the odor of acetic acid is noticeable, add enough ammonia to neutralize the acid and leave a faint odor of ammonia. Allow to cool for two hours, filter through a crucible, wash the precipitate with a cold solution containing 0.2–0.4 Gm. of oxine and a few drops of acetic acid per liter until the filtrate gives a negative test for halogen. Dry to constant weight at 105–110°. The precipitate is yellow and contains 21.97% of antimony.—T. I. PIRTEA. *Z. anal. Chem.*, 118 (1939), 26–30. (S. W. G.)

Arsenic—Colorimetric Semimicrodetermination of, in Urine During Massive Arsenical Treatment. The treatment involves the intravenous injection of 1.50 Gm. of neoarsenobenzene in 150 cc. of physiological salt solution. The solution is injected at the rate of one drop every three seconds and required two and one-half hours for completion. The determination of the arsenic in the urine is a check on the rate of elimination of the arsenical. *Method.* The sample (1 to 50 cc. of urine) should contain 50 to 1000 micrograms (0.05 to 1.0 mg.) which allows testing urine containing 1 mg. to 1 Gm. of arsenic per liter. Place the sample in an evaporating dish, add 5 Gm. of crystalline magnesium nitrate and evaporate to dryness on a water bath. Transfer the dish to a muffle heated to dull redness and ignite to a white ash (about 4 minutes). Cool, moisten with distilled water, take up in 10 cc. of hydrochloric acid, evaporate to dryness on a water bath, then ignite again for several minutes in the muffle. The second ignition destroys the nitrites formed during the first step. Cool, then add directly to the dish 10 cc. of Bougault's reagent (*J. pharm. chim.*, 26 (1907), 13) and suspend the insoluble particles with the aid of a glass rod. Add drop by drop and with constant stirring 5 cc. of a solution containing solution of potassium silicate (d. 1.28) 100 cc. and distilled water 500 cc. To the colorless liquid add a drop of $0.1N$ iodine solution, then transfer to a tube graduated at 20 cc., making up to 20 cc. with the rinsings from the dish and rod. Mix well, transfer to a dry tube and centrifuge for a short time. Transfer the clarified liquid to a Pyrex tube (dry and grease-free) 16 x 180 mm., place the tube in a boiling water bath for thirty minutes (avoid bumping) then allow the tube and contents to cool spontaneously before comparing it with a series of tubes made up with known amounts of arsenic. The standards are prepared by diluting different volumes of an aqueous solution of sodium arsenate, containing 0.4165 Gm. of the salt or 100 mg. of arsenic in 100 cc. of solution, with enough solution of magnesium chloride (300 Gm. $MgCl_2.6H_2O$ and 180 Gm. of water) to make 5 cc. and adding 10 cc. of Bougault's reagent and 5 cc. of the diluted solution of potassium silicate. A drop of $0.1N$ iodine solution is added to each tube, the contents mixed and the tube placed in a boiling water bath for thirty minutes. After cooling, place several cc. of liquid petrolatum in each tube to avoid loss by evaporation. The reagents must be free from arsenic and the glass should not have a yellow tint. The tubes may also be compared photometrically. The protected colloid is very stable.—J. V. HARISPE. *J. pharm. chim.*, 30 (1939), 58–70. (S. W. G.)

Arsenicals—Precipitation Reactions for Organic. (1) Reactions given by hydrogen sulfide in saturated acetonic solution. The arsenicals in alcoholic or hydroalcoholic solution (1% for the more soluble, saturated for those less soluble) were tested by adding 1 drop of reagent to 1 cc. of solution in a small tube. (2) Reactions given by mercuric nitrate solu-

tion (nitric acid 2 cc., mercuric nitrate 10 Gm., distilled water to 100 cc.). With alcoholic solutions of arsenicals 1 cc. of the solution is added to 1 cc. of reagent in a small tube. A ring is formed between the two layers. The color may vary from a white (in most cases) to a canary yellow (para-nitrophenarsazine chloride). With hydroalcoholic solutions of arsenicals the reagent is added and mixed. The properties of the precipitates obtained are reported. In the cases of beta-chlorovinyldichlorarsine, phenyldichlorarsine and methylphenylarsonate, hydrogen sulfide in acetone solution forms the arsine sulfides. This reagent gives no precipitate with arsinic and arsonic acids. The mercuric nitrate reagent gives no precipitate with arsenicals, in absolute alcohol, in which aliphatic or aromatic groups are bound to the arsenic in open chains. Reactions with twenty-four arsenicals are tabulated.—M. PERONNET and R. H. REMY. *J. pharm. chim.*, 30 (1939), 353–364. (S. W. G.)

Ascorbic Acid, Ketones and Aldehydes—Determination of, in Blood by Precipitation and Reduction. To 10 cc. of blood or plasma add 2 cc. of 4 times normal sulfuric acid and 15 to 20 Gm. of anhydrous magnesium sulfate. Extract the pulverulent mass formed with 80 and then with 20 cc. of methanol, add 20 cc. of twice normal hydrochloric acid to the filtered methanol solution, evaporate most of the methanol in vacuum, add enough hundredth-normal iodine solution to oxidize reducing substances present, then add 10 cc. of saturated solution of 2,4-dinitrophenylhydrazine in dilute hydrochloric acid and place in the refrigerator for 24 hours. Filter, wash the precipitate with warm twice normal hydrochloric acid. Dissolve the mixture of hydrazones in half-normal sodium carbonate, and reprecipitate the hydrazone of dehydroascorbic acid by passing carbon dioxide into the solution. It precipitates in pure form (melting point 270° C.), leaving the other hydrazones dissolved in the sodium bicarbonate solution. Dissolve the precipitate in methanol with the aid of hydrochloric acid, reduce the nitro groups with an excess of standard titanium trichloride solution at 50° C. in an atmosphere of carbon dioxide, and titrate the excess of titanium trichloride with standard ferric sulfate solution. The other hydrazones can be precipitated by hydrochloric acid and determined in the same manner.—L. ESPIL and MANDILLON. *Compt. rend. soc. biol.*, 129 (1938), 1187–1188; through *Chimie & Industrie*, 42 (1939), 32–33. (A. P.-C.)

Bromides—Determination of, in Presence of Chlorides. Potentiometric, colorimetric and titrimetric methods are reviewed. The following method for the determination of bromides in admixture with chlorides is recommended: Place 100 cc. of solution containing not more than 0.1 Gm. of bromide ion in a 500-cc. separatory funnel. Add 8 cc. of 10% sulfuric acid, 10 cc. of 5% potassium bromate solution, and 50 cc. of carbon tetrachloride. Mix the contents of the funnel vigorously, let stand for ten minutes, then extract the liberated bromine with four more 40–50 cc. portions of carbon tetrachloride. After each extraction rinse the stem of the funnel with a few cc. of carbon tetrachloride. Carefully transfer the carbon tetrachloride solutions to a 500-cc. glass-stoppered flask containing a solution of 2 Gm. of potassium iodide in 50 cc. of water. Mix the carbon tetrachloride solution with the potassium iodide solution and titrate the liberated iodine with $0.1N$ thiosulfate. The end-point is indicated by the simultaneous disappearance of the violet color from the carbon tetrachloride and the yellow color from the aqueous portion. One cc. $0.1N$ sodium thiosulfate is equivalent to 0.00665 Gm. bromine. The total halides can be determined by the Volhard method and the result expressed as bromine. The difference between the percentage of bromine obtained by the Volhard method and the percentage of bromine obtained by the iodometric method divided by 2.25 gives the percentage of chlorine in the sample. The procedure gives good results with 3–100 mg. of bromine and up to 300 mg. of potassium chloride, and 1% of potassium bromide or chloride can be determined in a sample of the other compound.—A. DENOEL. *J. pharm. Belg.*, 22 (1940), 179–184. (S. W. G.)

Bromine—Determination of, in Blood. A discussion of the various methods and their shortcomings. The technique found most satisfactory consists essentially in: destruction of organic matter by the Pfeiffer method; collection of the halogens in alkaline solution; acidification and precipitation of iodine, bromine and chlorine with silver nitrate; filtration and reduction with powdered zinc; colorimetric determination of bromine by the Kirchhoff method.—E. MARGULIES. *Diagnos tecnica labor.* 9 (1938), 393–401; through *Chimie & Industrie*, 41 (1939), 1075. (A. P.-C.)

Burette—Construction and Operation of Automatic Multiple. Structural details are given for building a simple automatic multiple burette along with directions for its operation. The apparatus consists essentially of burette-reservoir units and one control mechanism which works for 12 burette-reservoir units. The fluids which contact only glass, may contain a solute or stable colloidal particles without causing irregular operation through evaporation or the deposition of solids. Five diagrams.—J. S. TAPP. *Can. J. Research, B*, 18 (1940), 217–222. (W. T. S.)

Cadmium and Magnesium—Detection of. To 1 drop of the neutral solution add 0.5 cc. of 15% sodium carbonate dihydrate solution, 0.25 cc. of a solution of 0.5 Gm. of diazoaminobenzene in 100 cc. of acetone and a few drops of chloroform. If cadmium is present an orange-yellow color will be noted in the chloroform layer after shaking. The test is sensitive to 0.2 micrograms of cadmium. Copper gives a greenish color and silver gives a brownish-yellow color. Cobalt and nickel also interfere with the test. The test gives positive results with 20 micrograms of lead, manganese, zinc and magnesium. Another test for magnesium can be obtained using *p*-aminophenol hydrochloride. The latter test can be applied to 1 drop of a neutral solution containing no ammonium salts in the residue obtained from the solution of the Group V precipitate. To one drop of the solution add a few drops of concentrated ammonia solution and a little of the solid reagent. Shake a few times and let stand for a short time. Oxidation of the organic reagent occurs, the solution gradually becoming pale yellow, then a light yellowish-brown. If the precipitate of magnesium hydroxide is present it adsorbs the dye and the brownish color soon becomes blue. Cations which yield precipitates with ammonium hydroxide interfere.—E. EGRIWE. *Z. anal. Chem.*, 118 (1939), 98–100. (S. W. G.)

Calciferol—Standards for. Danish purity standards and tests for calciferol (crystalline vitamin D_2) are described and discussed. The most important identity test is the preparation of the ester, calciferol-3,5-dinitrobenzoate, which is identified by the m. p. 145–147° C., and optical rotation in benzol (2% in 1 dm. tube) $[\alpha]_D = +55$ to $+60$. The optical rotation of calciferol in absolute alcohol is $[\alpha]_D = +102.5$; to $+107.5$; in acetone it is around $+83$. A test for ergosterol by digitonin precipitation is cited. Constants of three commercial preparations of calciferol are tabulated.—V. H. MIKKELSEN. *Arch. Pharm. Chemi*, 47 (1940), 300. (C. S. L.)

Carbon Dioxide—Determination of, in Aqueous Solution. A new apparatus is described which is suitable for the determination of free and combined carbon dioxide in aqueous solution. The method used is based on that previously described by the author, for the determination of carbon dioxide in solid carbonates, and consists essentially in the liberation of the carbon dioxide in an apparatus under reduced pressure, absorption of the evolved carbon dioxide in $0.1N$-baryta solution, and back titration of the baryta with standard oxalic acid. The accuracy is of the same order as for the earlier method, *viz.*, within 0.5% of the true carbon dioxide content.—J. R. I. HEPBURN. *J. Soc. Chem. Ind.*, 58 (1939), 340–342. (E. G. V.)

Chemical Tests—Sensitivity of. III. Examination of Different Types of Tests. *Lithium.*—The tests with sodium carbonate, ammonium carbonate, disodium hydrogen phosphate, disodium hydrogen arsenate and Alizarin Red S were studied. The test with Alizarin Red S was the most sensitive; under favorable conditions the presence of about 0.6 Gm. of lithium chloride in 10 cc. of solution can be detected with 1 cc. of 0.125% solution of the reagent. *Ammonia.*—Tests were studied using mercuric chloride, mercuric chloride plus sodium carbonate; for ammonium ion sodium chloride plus mercuric chloride, sodium hypochlorite plus potassium iodide, iodine in potassium iodide solution, phenol plus sodium hypochlorite, sodium phenolate plus sodium hypochlorite, sodium cobaltinitrite, sodium hydrogen tartrate, picric acid, sodium picrate and cupric sulfate. The most sensitive tests were those using Graves' reagent of sodium chloride plus mercuric chloride and phenol plus sodium hypochlorite. In 10 cc. of solution 1 microgram of ammonia can be detected. *Magnesium.*—Tests with 8-hydroxyquinoline and with hexamethylenetetramine were studied along with reactions in which precipitates of magnesium hydroxide are colored by iodine, diphenylcarbazide, Alizarin Red S, Toluylene Orange, Azo Blue, Chicago Blue, Diamine Pure Blue, Brilliant Yellow and Alizarin Yellow. Many of these tests were found to be very sensitive. *Copper.*—Tests were carried out with pyridine plus ammonium thiocyanate, hexamethylenetetramine plus potassium iodide, diphenylcarbazide alizarin red, benzidine in the presence of (*a*) potassium iodide, (*b*) ammonium thiocyanate, (*c*) potassium bromide or sodium chloride and guaiac resin in the presence of (1) ammonium thiocyanate or (2) sodium chloride or potassium bromide. Most of these tests were found to be very sensitive. Results of the tests are tabulated.—Z. KARAOGLANOV. *Z. anal. Chem.*, 119 (1940), 16–55. (S. W. G.)

Cherry Juice—Evaluation of a New Monograph for. A test for lead is devised which is essentially that used in the U. S. P. monograph for citric acid except that it is preceded by a combustion of the organic matter present.—KARL B. ROSEN. *Bull. Natl. Formulary Committee*, 8 (1940), 348–350. (H. M. B.)

Chlorate and Bromate—Volumetric Determination of. The oxidation of thiourea ($CS(NH_2)_2$) to $(NH_2(NH)CS)_2$ has been used for determining the former and for titrating chromate or determining manganese dioxide, lead dioxide and per-compounds. The oxidizing agent is allowed to act upon an excess of thiourea and the excess is measured by titration with bromate-bromide solution in the presence of potassium iodide. A similar procedure is applied to the titration of chlorate or bromate, and potassium permanganate can be used just as well as potassium bromate for titrating the excess thiourea. The following procedure is given for the determination of chlorate: Mix 20 cc. of $18N$ sulfuric acid, 5 cc. of 1% potassium iodide solution and a carefully measured volume of $0.1N$ thiourea. While rotating the flask, add the chlorate solution, heat at 70° for 10–15 minutes, cool to 35°, add starch indicator solution, dilute to about 80 cc. and titrate with potassium bromate-bromide solution or with potassium permanganate. The bromate determination is given as follows: Start with the same mixture as given for chlorate and add the bromate solution very slowly, almost dropwise. Heating on a water bath is unnecessary but the solution should be heated to 35° before titrating. The results obtained were within 0.03 cc. of $0.1N$ solution.—C. MAHR and H. OHLE. *Z. anal. Chem.*, 117 (1939), 389–391. (S. W. G.)

Chromatrographic Analysis. A concise review of the subject.—W. KOPACZEWSKI. *Bull. sci. pharmacol.*, 46 (1939), 455–461. (S. W. G.)

Color Names for Drugs and Chemicals—Instructions for Determining the. Detailed directions are offered.—KENNETH L. KELLY. *Bull. Natl. Formulary Committee*, 8 (1940), 359–369. (H. M. B.)

Dichloroethyl Sulfide (Yperite) and β-Chlorovinylchloroarsines (Lewisite)—Action of Nessler's Reagent on, in Aqueous Medium. The following procedure is given: Add 2 cc. of freshly prepared Nessler's reagent, drop by drop and with constant shaking, to 10 cc. of the sample in a tube. If the water is contaminated with yperite a yellowish white precipitate forms almost immediately. This reaction is still noted when the concentration of the yperite is 0.07 Gm. per liter. If the water contains lewisite the following reactions are noted, with the compound expressed as Gm. of arsenic per liter; 0.0029—pale greenish yellow at first, becoming more accentuated; 0.0097—clear pale yellow becoming turbid in about three minutes and changing to rose; 0.029—yellow color changing to chestnut and forming a precipitate; 0.058 and 0.147—orange-yellow color changing to chestnut and finally a grayish precipitate; 1.47 and 2.93—white precipitate immediately, changing to gray in two minutes. With solutions of dihydroxyethyl sulfide no reaction is noted until a concentration of 6.0 Gm. per liter is reached and then a faint yellow color is observed.—J. DELGA. *J. pharm. chim.*, 1 (1940), 5–8. (S. W. G.)

Distilled Water—Electrical Apparatus for the Preparation of. A detailed description is given of a new electrical apparatus for producing a very pure distilled water. The purity and sterility of the water is indicated by the results of several standard tests. An illustration of the apparatus is included.—J. THOMANN and E. SCHENKER. *Schweiz. Apoth.-Ztg.*, 77 (1939) 125–130. (M. F. W. D.)

Dithizone Determination by the Formation of Compound Colors—Accuracy of. The method consists in adding a solution of dithizone in carbon tetrachloride to the solution to be analyzed; there is formed a colored dithizone complex of the metal to be determined, which gives a compound color with the excess of reagent (green in acid solution). The color is compared with that of an equal volume of the reagent to which has been added a solution of known concentration of the metal to be determined. This colorimetric method gives rise to large errors in the violet-red and green regions of the spectrum; they are smaller in the gray region (2% for copper, 3% for zinc).—H. GRUBITSCH and J. SINIGOJ. *Z. anal. Chem.*, 114 (1938), 30–38; through *Chimie & Industrie*, 41 (1939), 1065–1066. (A. P.-C.)

Drying Agent—New. "Blaugel" is a new dehydrating agent composed of a silicic acid gel containing a little cobalt salt. The gel under the usual working conditions will take up about 18% of its weight of water, turning from blue to a deep red.

The advantages claimed for it are as follows: clean in handling, does not pack and does not powder, is chemically indifferent, can easily be controlled because of the change in color with moisture content, cheap to use since it is easily regenerated by heating to 180° to 200° in an oven.—LYK. *Schweiz. Apoth.-Ztg.*, 77 (1939), 309–311. (M. F. W. D.)

Ephedrine Sprays and Ephedrine Jelly—Assay of. Experiments of Wilson are not suited for official purposes. The following assays are proposed: *Simple and Compound Ephedrine Sprays.*—Measure carefully a 10 cc. sample of the preparation to be tested into a separator, washing the pipette with three 5 cc. portions of ether. Add 10 cc. of 2% sulfuric acid, shake and transfer the acid layer to a second separator. Repeat this procedure with three 5 cc. portions of the same acid, combining the extracts with the original 10 cc. portion. To the combined extracts, add slowly a 10% solution of sodium hydroxide until the mixture is alkaline to litmus paper (about 7 cc.). At this point add 1 cc. of the alkali in excess and extract with 6 portions of ether using 40, 30, 25, 25, 20 and 20 cc., respectively. Collect the ether extracts in the second separator, wash with two successive 5 cc. portions of water and transfer the water to a third separator. Extract the wash water with 10 cc. ether, add this to the combined ether extracts in the second separator, and discard the wash water. Extract the combined ether extracts with 20 cc. of $N/20$ sulfuric acid, accurately measured and then successively with three 10 cc. portions of water and combine the sulfuric acid and water extracts in a beaker. Warm the combined extracts on a water bath until the odor of ether has disappeared. Cool the solution and titrate the excess of acid with $N/50$ sodium hydroxide using methyl red as an indicator. Each cc. of $N/20$ acid is equivalent to 0.00825 Gm. of ephedrine. *Jelly of Ephedrine Sulfate.*—Weigh accurately about 10 Gm. of the sample and transfer to a separator, rinsing the weighing vessel with several portions of water (about 15 cc. total) until the jelly is completely transferred. Continue with the above assay for sprays starting with the words "To the combined extracts add slowly a 10% solution of sodium hydroxide." Each cc. of $N/20$ sulfuric acid is equivalent to 0.00825 Gm. ephedrine and 0.0107 Gm. ephedrine sulfate.—KARL. B. ROSEN. *Bull. Natl. Formulary Committee*, 8 (1940), 353–357. (H. M. B.)

Fluorine in Water—Determination of Small Amounts of. To compare the prevalence of mottled teeth to the fluorine content of natural waters in Alberta the authors have critically studied some colorimetric and titration methods for determining fluorine. Refinements of the methods are reported along with complete details of the improved procedures.—OSMAN JAMES WALKER and GORDON ROY FINLAY. *Can. J. Research, B.*, 18 (1940), 151–159. (W. T. S.)

Gentian Violet as an Indicator. Gentian violet proves to be a sensitive indicator in the titration of the salts of organic or weak acids, if strong mineral acids are used. Sulfuric or hydrochloric acid will change the color of an aqueous solution of gentian violet to blue or greenish blue; 5 cc. or 5 Gm. of the salt in question is dissolved in 50 cc. of distilled water with 1 cc. of 1% aqueous solution of gentian violet added; and normal H_2SO_4 is run in drop by drop until the color changes from violet to blue or greenish blue. The amount of acid used multiplied by the molecular equivalent in milligrams times 200 equals the percentage of the salt. This method may be used for acetates, benzoates, carbonates, citrates, formates and tartrates.—VIRGILIO LUCAS. *Rev. Assoc. Brasil. Farm.*, 20 (1939), 138. (G. S. G.)

Glutathione—Iodometric Determination of, in Tissues. I. For the determination of glutathione in presence of ascorbic acid, the latter is removed by oxidizing by means of ascorbic acid oxidase and the glutathione is determined iodometrically by titrating in acid solution with potassium iodate after addition of potassium iodide.—A. FUJITA and I. NUMATA. *Biochem. Z.*, 299 (1938), 249–261; through *Chimie & Industrie*, 42 (1939), 31. (A. P.-C.)

Hemp—Chemical Determination of, in Fabrics Mixed with Cotton. The reagent is prepared by dissolving 10 Gm. of copper sulfate in 100 cc. of distilled water, adding 14 cc. of solution of ammonia (sp. gr. 0.910) until the precipitate first formed is dissolved, then adding gradually 150 cc. of 15% *w/v* solution of crystallized sodium carbonate. The precipitate is allowed to stand a few minutes then filtered by suction on a sintered glass filter (Jena N.3. G 17) and drained as dry as possible. Twenty cc. of solution of ammonia are added and stirred with a rod until a homogeneous paste is obtained; it is then transferred, using 250 cc. of ammonia in all, to a flask and shaken until dissolved. The reagent thus prepared contains 0.85% of copper. It should be freshly prepared. A piece of the fabric is boiled for 15 minutes in 100 cc. of 0.1% solution of sodium carbonate, it is then washed in running water, rubbing lightly with the finger, then boiled for 15 minutes in distilled water, dried in an oven and left in the air for 24 hours to regain its normal humidity. It is then examined under the microscope to estimate roughly the proportion of hemp. If it is less than 30%, 80 cc. of the reagent is diluted to 200 cc. with distilled water, if it is more, 96 cc. is diluted to 200 cc. A piece of the washed fabric weighing about 1 Gm. is taken, separated into its individual threads and the latter reduced to a length of about 1 cm. and then accurately weighed, transferred to a 250-cc. stoppered wide-mouthed cylinder containing the 200 cc. of reagent and shaken vigorously and continuously for 15 minutes, at a temperature not exceeding 20°. The fiber is transferred to a fine sieve, standing on three feet, with 60 meshes per cm., and washed thoroughly with a strong fan-shaped jet of water for 3 minutes. The blue fiber is collected carefully, immersed in 500 cc. of water containing 10 cc. of glacial acetic acid, washed again with water and then with alcohol and ether, dried in the oven, exposed to the air for 24 hours and weighed. The residue is the cotton, the hemp having been dissolved.—A. CAPPELLI and R. TUFFI. *Ann. chim. appl. Roma.*, 29 (1939), 225; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 756. (S. W. G.)

Hexamine—Existence of Salts of, in Solution. Some authors hold that some salts of hexamine have a different physiological action from that of hexamine alone plus that of the acid concerned; if that is so, solutions of them must contain a compound and not merely hexamine and the free acid. Hexamine in solution is rapidly hydrolyzed by acids into formaldehyde and ammonia which combines with the acid. Since 1 mol. of hexamine yields 4 mol. of ammonia and 6 mol. of formaldehyde this decomposition is very suitable for investigation by means of the lowering of the freezing point. Experiments were carried out with hexamine and hydrochloric, acetic, formic, oxalic, tartaric, citric and phosphoric acids. It was found in all cases that the lowering of the freezing point, taken immediately on mixing, caused by the hexamine and acid together, was less than the sum of the lowering caused by the two separately, thus proving that molecular combinations were formed, but on standing at 15°, the lowering of the freezing point steadily increased, thus proving hydrolysis was taking place, and in the case of hydrochloric acid the hexamine was com-

pletely decomposed in twelve days, with other acids from 18% to 32% was decomposed in the same period. Hydrolysis takes place even if there is less acid than that required to saturate the hexamine. This shows that it is possible that freshly prepared substances may have a special activity due to compounds being formed, but on keeping, or immediately on sterilization, the greater part splits into aldehyde and ammonium salts.—A. RATTU. *Ann. chim. appl. Roma,* 29 (1939), 221; through *Quart. J. Pharm. Pharmacol.,* 12 (1939), 765. (S. W. G.)

Indoöxine (5,8-Quinolinequinone-8-hydroxy-5-quinolyl-5-imide)—New Precipitating Agent with Indicator Properties. The compound is a reddish brown crystalline powder melting at 253–254°. It forms a 1% solution in dioxane but the saturated aqueous solution at 95° contains only 0.04%. It dissolves in mineral acids and in glacial acetic acid to form red solutions, but after a few hours decomposition occurs. The addition of excess alkali hydroxide changes the color to green, and with concentrated solutions brown lustrous crystals of the alkali salt of indoöxine is precipitated. In dilute solutions the compound changes from red to blue at p_H 6–8, and can be used as an indicator in the titration of 0.01*N* mineral acids with 0.01*N* alkali hydroxide solutions. It forms a difficultly soluble silver salt having a bluish green color and can be used as an indicator in the titration of halides with silver nitrate solution. The compound gives precipitates with many different ions. The precipitates form in acetic acid or ammoniacal solutions and are blue or bluish green in color. Good results can be obtained in the determination of copper, nickel, mercury, etc., when present in quantities of 1 mg. or less by the filtration method of titration, where the end-point is reached when the filtered solution gives no test with the 0.05% solution of the reagent in alcohol.—R. BERG and E. BECKER. *Z. anal. Chem.,* 119 (1940), 81–90. (S. W. G.)

Isopropyl Alcohol—New Monograph for. A review of the physical, bacteriocidal and pharmacological properties and uses of this alcohol are presented. It is evident it possesses solvent and antiseptic properties at least equal to those of ethyl alcohol. It is non-potable, free from taxation and without restriction in most of its present applications and offers to the pharmacist unlimited uses.—HARVEY A. K. WHITNEY and DON E. FRANCKE. *Bull. Natl. Formulary Committee,* 8 (1940), 387–391. (H. M. B.)

Magnesium—Electrophotometric Method for the Microdetermination of, in Biological Fluids. The ash from 0.2 to 2.0 cc. of serum is extracted with 1.0, 0.5 and 0.5 cc. of 0.5% acetic acid and the calcium is removed from the combined solutions by precipitation as oxalate. The magnesium is then precipitated by adding ammonia and 0.15 cc. of a 2% solution of hydroxyquinoline in alcohol and warming to 70° C. The washed precipitate is dissolved in hot 0.5% acetic acid, a drop of ferric chloride solution is added to form the colored iron-hydroxyquinoline compound and the solution is compared with a standard after suitable dilution.—R. WOLFF. *Bull. soc. chim. biol.,* 20 (1938), 1265–1275; through *Chimie & Industrie,* 42 (1939), 31. (A. P.-C.)

Malt Extract—Analytical Characters of. Malt extract may be adulterated with extracts made from "malt" of grain other than barley, or with liquid glucose. Such adulteration is indicated by the taste, or by exceptional viscosity or appearance. The density of genuine extract ranges from 1.377 to 1.430, corresponding to a content of extractive of 74% to 82%. The acidity is greater than that of the original malt, and increases on storage. The proportion of mineral constituents ranges from 0.95% to 1.45%, and of phosphates (P_2O_5) from 0.49% to 0.74%, but the ratio of phosphate to mineral constituents shows some variation, the phosphate content being affected by the composition of the water used for the extraction. The ratio of maltose to dextrin, the percentage of protein and the degree of hydrolysis of protein, vary with the sample of malt and the mashing process, while owing to the presence of dextrins with an uncertain reducing power it is difficult to carry out a satisfactory assay of maltose and dextrins.—H. VIERMANN and G. NEUMÜLLER. *Z. Untersuch. Lebensm.,* 77 (1939), 375; through *Quart. J. Pharm. Pharmacol,* 12 (1939), 643. (S. W. G.)

Mandelic Acid—Rapid Identification of, and Its Salts. The following procedure is recommended: To 2–4 Cg. of sample in a tube, add about 0.5 cc. of nitric acid and heat to boiling with constant shaking until the mixture becomes yellowish. The oxides of nitrogen may be removed by blowing into the reaction tube through a long glass tube. Add 10 drops of water, heat to boiling and note the odor of oil of bitter almonds. Add sodium hydroxide solution and observe the orange-yellow color which develops on boiling. The reaction is sensitive to 4–5 mg. of mandelic acid. The following reactions are given: Place 1 drop of 3% silver nitrate solution on a glass slide, drop a small particle (about 1 mg.) of the sample in the liquid and mix with a fine rod. Groups of crystalline needles of silver mandelate form. With calcium mandelate the above procedure slowly yields similar crystals mixed with undissolved salt. With ammonium mandelate solution, place a droplet of the sample in a drop of the silver nitrate reagent. Let the amorphous-appearing mixture stand in the dark for five to ten minutes, then observe the crystals, especially along the edges. Reactions with mercurous nitrate solution (10 Gm. mercurous nitrate crystals in a mixture of 10 cc. of nitric acid and 100 cc. of water), acetic lead acetate solution (5 Gm. of neutral lead acetate in a mixture of 2 cc. of acetic acid and 100 cc. of water), ammoniacal mercury sulfate solution (mercuric sulfate reagent with an equal volume of strong solution of ammonium hydroxide) and 1% copper sulfate solution are described. To test the sample for free mandelic acid, add to several particles a drop of acetone, allow to evaporate and examine the crystals. If a drop of water is used instead of acetone the slide can be heated below 40° to hasten the evaporation.—G. DENIGES. *Bull. trav. soc. pharm. Bordeaux,* 77 (1939), 137–147. (S. W. G.)

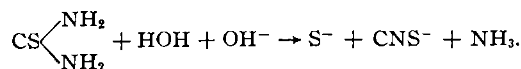
Mandelic Ion—Use of, as Reagent for Cupric Salts. The following procedure is given: Place 2–3 cc. of the cupric solution in a tube, add 8–12 drops of a 10% solution of ammonium mandelate or mandelic acid, heat to boiling and boil for one-half minute. A slightly greenish white precipitate forms. The reaction is sensitive to 0.2 mg. of copper. The precipitate formed with mandelic acid consists of isolated hexagonal plates; while the ammonium mandelate yields spheroid masses of crystals.—G. DENIGES. *Bull. trav. soc. pharm. Bordeaux,* 77 (1939), 148–149. (S. W. G.)

Marihuana Investigations. II. The Effect of Variety, Maturity, Fertilizer Treatment and Sex on the Intensity of Response to the Beam Tests. It was pointed out in an earlier report that individual cannabis plants though of the same agronomic variety, vary widely in capacity to respond to the acid and alkaline Beam tests; that the substance responsive to the tests is generally found in all parts of the plant except pith, lower stalk and roots; that many respond when no more than three inches tall and continue to respond throughout life; and that male and female plants respond alike. Since completion of the present research, a pure substance, cannabidiol has been isolated. It re-

sponds intensely to the alkaline Beam test. It was a considerable portion of the resin from which it was prepared and most likely it is the chemical individual to which the test is mainly due. Experimental work is reported in much detail with numerous tabulations. The following conclusions were reached: (1) Different agronomic varieties of Cannabis vary markedly in chemical makeup of resin as evidenced by wide differences in response to the alkaline Beam test. (2) Treatment of the soil with various fertilizers alone and in combination is without effect on alkaline Beam test response under the conditions studied. (3) Male and female plants respond essentially alike to the alkaline Beam test. (4) Intensity of response to the alkaline Beam test tends to increase with age of plants at least until the time of flowering. (5) Intensity of response to the acid Beam test was not definitely influenced by varying variety, fertilizer, sex or age of plants except that there was observed a statistically significant diminution in intensity after the plants had flowered.—JOHN R. MATCHETT, JOSEPH LEVINE and LOUIS BENJAMIN, B. B. ROBINSON and O. A. POPE. *Jour. A. Ph. A.*, 29 (1940), 399. (Z. M. C.)

Medicinal Products—Spot Tests for. IV. Detection of Chloroform. Chloroform reacts with sodium hydroxide and ammonia to form sodium cyanide which gives a blue color with cupric acetate and benzidine acetate. The test can detect 0.040 mg. of chloroform. If the benzidine is replaced by 2,7-diaminofluorene, the sensitivity of the test is about doubled.—O. FREHDEN and K. FÜRST. *Mikrochimie Acta*, 3 (1938), 133–135; through *Chimie & Industrie*, 41 (1939), 1142. (A. P.-C.)

Mercuric Chloride—Assay of. An attempt has been made to avoid use of hydrogen sulfide in the official assay and use of organic compounds which evolve hydrogen sulfide vapors was also avoided. Thiourea hydrolyzes in alkaline medium without perceptible odor of hydrogen sulfide:



$$CS\langle^{NH_2}_{NH_2} + HOH + OH^- \rightarrow S^= + CNS^- + NH_3.$$

If the p_H is controlled so that solution is alkaline enough for the above reaction results are precise but too high. Likewise U. S. P. XI gave high results. An experiment in washing the precipitate with carbon disulfide indicated that the amount of free sulfur is small and easily extracted. Both the 1932 British Pharmacopœia method and the Rauscher volumetric method were tried. The author concludes that the U. S. P. XI method and the thiourea method are both precise but yield high results and that omitting washing of precipitate makes only slightly worse results: the B. P. method is satisfactory and is the most rapid method studied; a modification of the Rauscher method is preferable to the B. P. in being a direct instead of a residual titration.—BERL S. ALSTODT. *Jour A. Ph. A.*, 29 (1940), 364. (Z. M. C.)

Mineral Phosphates—Colorimetric Determination of Small Quantities of, in Urine. The technique of Bell-Doisy-Briggs was modified to remove urinary pigments and the turbidity which is particularly troublesome for the determination of small quantities of phosphorus. By treating the urine with animal charcoal in trichloroacetic acid solution a clear colorless solution is obtained, permitting of accurate determinations.—G. BARAC. *Bull. Soc. chim. biol.*, 20 (1938), 1279–1281; through *Chimie & Industrie*, 42 (1939), 32. (A. P.-C.)

Moisture Test—Weighing Tube for. A weighing tube holding 5 Gm. of soap, creams or emulsions is suggested together with a modified distillation method.—R. B. TRUSLER and L. E. WEEKS. *Soap*, 16 (1940), No. 6, 63; through *Am. Perfumer*, 41 (1940), No. 1, 67. (G. W. F.)

N. F. Ointments—Adaptation of Assay Methods for Some. IX. Alkaline Ointment of Sulfur. Since it was noticed that there was a loss of potassium carbonate which was found to be due not to any acidic reaction of the ointment but to some reaction of the sulfur the following procedure was used for preparing the ointment: "Dissolve the potassium carbonate in water; incorporate the wool fat with this mixture, then add the mixture of yellow wax and petrolatum, previously melted and cool and mix thoroughly." *Assay for Potassium Carbonate.*—Place about 1 Gm. of the ointment in a glass-stoppered Erlenmeyer flask. Add 50 cc. of warm toluene and shake to dissolve the sulfur and the ointment base. Add 25 cc. of water and 3 drops of methyl orange test solution as the indicator. Titrate the potassium carbonate with $0.1N$ sulfuric acid, shaking vigorously at frequent intervals. Carefully preserve the Erlenmeyer flask and its contents for the determination of the sulfur. Each cc. of $0.1N$ sulfuric acid is equivalent to 0.00691 Gm. potassium carbonate. *Assay for Sublimed Sulfur.*—Transfer the contents of the Erlenmeyer flask used in the preceding assay to a separatory funnel. Discard the aqueous portions of the mixture. Wash the toluene solution with two 30 cc. portions of water and discard the washings. Transfer the toluene solution to a 400-cc. Erlenmeyer flask and carefully evaporate to dryness on a water bath. To the material remaining in the flask add about 35 cc. of water, 2 Gm. anhydrous sodium sulfite, 2 Gm. of paraffin, and reflux the mixture until all of the sulfur is dissolved. Allow the solution to cool and then filter. Wash the residue on the filter with three 30 cc. portions of hot water and add the washings to the filtrate. Allow the solution to cool, then add 15 cc. of solution of formaldehyde and 20 cc. of acetic acid. Dilute the mixture to approximately 200 cc. with distilled water, and titrate with $0.1N$ iodine, using starch test solution as an indicator. Each cc. $0.1N$ iodine is equivalent to 0.003206 Gm. S.—WILLIAM B. BAKER, HARRY P. ALLEN and MARCEL RADEMACKER. *Pharm. Arch.*, 11 (1940), 65–71. (H. M. B.)

p-Nitrobenzylcyanide as Indicator. A 0.5% solution of p-nitrobenzylcyanide in alcohol can be used as an indicator in acidimetric and alkalimetric titrations. Two drops of the solution in 100 cc. of water gives a pale yellow color with the addition of 0.3 cc. of $1N$ sodium hydroxide, corresponding to p_H 11.42; at p_H 12.00 the color becomes pinkish yellow and at p_H 12.91 becomes orange-red, no further change of color occurring with the addition of more alkali; the latter p_H corresponds to $0.08N$ sodium hydroxide.—L. SPITZER. *Ann. chim. appl. Roma*, 29 (1939), 219; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 613. (S. W. G.)

Nitrogen Determination—Use of Mercury Selenite as a Catalyst in, by the Kjeldahl Method. As a result of the tests carried out, the following technique is recommended: to the sample add a suitable quantity of concentrated sulfuric acid and 20 mg. per cc. of acid used of a mixture of 1 Gm. of mercury selenite and 24 Gm. of potassium sulfate; heat gently at first, and then boil; the operation is finished when the liquid becomes clear, though retaining the reddish brown color due to the selenium. The time required generally does not exceed 30 minutes for the size of sample used in microanalysis.—C. DUMAZERT and Y. MARCELET. *Bull. Biol. Pharmaciens*, (1938), 546–552; through *Chimie & Industrie*, 41 (1939), 1071. (A. P.-C.)

Novocain—Bromometric Determination of, in Anesthetic Solutions. When a sufficient amount of

bromide-bromate solution is added to a hydrochloric acid solution of novocain hydrochloride a crystalline precipitate consisting of fine needles is obtained in a few minutes. On adding an excess of ethanol and of potassium iodide the precipitate is redissolved, and the iodine, liberated by the excess of bromine, remaining in the solution can be titrated with decinormal sodium thiosulfate. The method was applied to the determination of novocain in anesthetic solutions (aqueous solutions, solutions in physiological salt solution, novocain-adrenaline-sodium thiosulfate solutions, novocain-adrenaline-sodium bisulfite-benzoic acid solutions). The method gives satisfactorily accurate results. Addition of sodium chloride to novocain solutions does not appreciably affect the results. Presence of sodium thiosulfate and of sodium bisulfite does not interfere, provided account is taken of the amount originally present in the solutions.—O. A. ROSSI. *Rev. Centro Estud. Farm. Bioquim.*, 28 (1938), No. 2, 60–66; through *Chimie & Industrie*, 41 (1939), 1145. (A. P.-C.)

Organic Nitrogen—New Method for Determining. The method consists in breaking down the material under pressure in alkaline solution and titrating the ammonia formed. The procedure recommended is as follows: place 1000 cc. of the substance and 250 cc. of concentrated sodium or potassium hydroxide solution in a small autoclave; heat the latter so that a pressure of 12 kilos per sq. cm. and a temperature of 180° C. is reached in 10 minutes; connect the autoclave to a receiver containing standard acid through a condenser and a separator containing 150 cc. of slightly alkalinized water (to prevent entrainment of alkali from the autoclave); relieve the pressure in about 12 minutes, bringing the water in the separator to a boil when the pressure in the autoclave has fallen to about 4 kilos and boiling for another 10 minutes after the pressure has been completely relieved. The total time required for a determination does not exceed 35 to 40 minutes.—G. ROCCHI and R. DEL MONTE. *Chim. e Ind. (Milan)*, 20 (1938), 546–547; through *Chimie & Industrie*, 41 (1939), 1071. (A. P.-C.)

Paper, Cotton and Products Substituted for Artificial Silk. The physical and chemical properties of the substances used as adulterants in artificial silk are reviewed. The color reactions of paper cotton, silk and artificial silks with iodo-zinc iodide reagent and with phloroglucine reagent are tabulated.—J.-A. LABAT. *Bull. trav. soc. pharm. Bordeaux*, 77 (1939), 163–179. (S. W. G.)

Periodic Acid—Action of, on Pyruvic, Acetic and Propionic Acids. *Pyruvic Acid.*—Place in the flask of a Desgrez apparatus (*J. pharm. chim.*, 29 (1939)) 25 cc. of $0.1M$ sodium pyruvate solution, 50 cc. of $0.1M$ sodium periodate solution, 1 cc. of 50% sulfuric acid and 24 cc. of distilled water. Place 25 cc. of $0.2N$ sodium hydroxide in the first absorption bottle and 10 cc. of the alkali solution in the second bottle. Heat the reaction mixture on a boiling water bath for one hour, maintaining a current of carbon dioxide-free gas through the apparatus. Cool and pass the gas through the apparatus for another 1.5 hours. Determine the excess alkali in the presence of 33% barium chloride using $0.2N$ hydrochloric acid and phenolphthalein. Mix 25 cc. of $0.1M$ sodium pyruvate solution with 50 cc. of $0.1M$ periodic acid in the flask of a Pregl apparatus and remove the volatile products formed by steam distilling for 75 minutes. Neutralize the distillate with calcium carbonate, evaporate on a water bath, connect a delivery tube and heat to redness, collecting the vapors in cold water. The aqueous solution gives positive tests for acetone. Acetic acid and propionic acid were not oxidized when mixed with $0.1M$ periodic acid and heated on a water bath for 24 hours. The following conclusions are given: Pyruvic acid is oxidized quantitatively by periodic acid to acetic acid and carbon dioxide. The reaction is much more rapid than that with lactic acid. This, together with the relatively slow oxidation of acetaldehyde, indicates that pyruvic acid is not an intermediary product in the oxidation of lactic acid by periodic acid.—P. FLEURY and R. BOISSON. *J. pharm. chim.*, 30 (1939), 307–316. (S. W. G.)

Peroxides—Determination of Active Oxygen in Alkaline. The author examined various methods for determining the active oxygen in sodium peroxide, on various commercial samples of the peroxide, particularly those forms commonly used for purification of air by absorbing carbon dioxide and liberating the corresponding amount of oxygen. The volumetric methods of Rupp, using barium hydroxide and potassium iodide, titrating with sodium arsenite and of Bosshard, using boric acid and titrating with potassium permanganate gave low and variable results but the following methods are reliable. In Archbutt's method about 0.2 Gm. of the peroxide, accurately weighed, is inserted in a tube in a flask, containing 10 cc. of a 1% solution of cobalt nitrate, attached to a Lunge's nitrometer. After making the pressure inside the apparatus equal to the external pressure the peroxide is mixed with the cobalt nitrate solution and when the reaction is completed the volume of oxygen evolved is read off; 100 Gm. of sodium peroxide gives 14.35 liters of oxygen at 0° and 760 mm. pressure. Five mg. of copper oxide, or of manganese dioxide, with 10 cc. of water may be used in place of the cobalt nitrate, but silica and animal charcoal which have also been recommended do not give satisfactory results. In Degrez's method, 2 or 3 Gm. of lead peroxide, 20 cc. of distilled water and about 5 Gm., exactly weighed, of sodium peroxide are made to react in a flask, fitted with a tube filled with pumice soaked in sulfuric acid through which the evolved oxygen has to pass. The loss in weight after the reaction is that of the oxygen set free. Poggi's method is on the same principle, using Schrötter's apparatus for the determination of carbon dioxide in carbonates, liberating the oxygen by the cautious addition of dilute (1 to 4) sulfuric acid to 0.7 to 1.5 Gm. of peroxide. The results by these two methods were the same as by Archbutt's method except in one case where Poggi's method gave a slightly lower result.—M. SARTORI. *Ann. chim. appl. Roma*, 29 (1939), 381; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 757. (S. W. G.)

Persulfate and Hydrogen Peroxide—Determination of, in Admixture. A mixture of hydrogen peroxide and persulfate cannot be titrated satisfactorily with permanganate, as the presence of manganese salts catalyzes the reaction between the two components and leads to loss of oxygen. The method suggested by the author is based on the destruction of the peroxide by osmic acid. The total oxidizing power of the solution is first determined by ferrous sulfate. A quantity of the solution, corresponding to not more than 40 cc. of $N/10$, is made alkaline with 2 cc. of $N/1$ sodium hydroxide solution and treated with 5 drops of osmic acid solution (0.5 Gm. of OsO_4 per liter), After frequent shaking during five minutes, the liquid is acidified with 5 cc. of phosphoric acid (40%) and 10 cc. of $5N$ sulfuric acid. The complete decomposition of the peroxide may be checked by the addition of a few drops of $M/10$ manganese sulfate solution and a drop of permanganate, when the mixture should show a slight pink color. The mixture is then treated with 50 cc. of ferrous sulfate solution, and, after five minutes, the excess of iron is titrated back. An acidimetric determination of the persulfate is

based on the reaction $K_2S_2O_8 + H_2O = 2\ KHSO_4 + O_2$. A quantity of the solution, diluted if necessary, is treated with 10 cc. of $N/1$ hydrogen peroxide solution. It is then neutralized to methyl orange and treated with 5 cc. of $N/10$ silver nitrate solution and 2 cc. of $N/10$ manganese sulfate solution. The mixture is warmed, and then boiled for a few minutes. After cooling, 2 Gm. of ammonium sulfate is added and the acidity is titrated with $N/5$ sodium hydroxide solution, using methyl orange as indicator.—J. H. VAN DER MEULEN. *Rec. Trav. Chim. Pays-Bas,* 58 (1939), 553; through *Quart. J. Pharm. Pharmacol.,* 12 (1939), 758. (S. W. G.)

p_H—Determination of, in Pharmacy. The simpler and more economical methods of determining p_H are described. The Gillespie method is discussed in detail, enumerating its advantages and disadvantages. Another method using a definite number of drops of indicator and an acid-base complete for comparison with the unknown is described in detail. A set of nine indicators is used depending on the p_H of the unknown. The method of calculation is also given.—MARCEL NICOLET. *Schweiz. Apoth.-Ztg.,* 77 (1939), 477–483. (M. F. W. D.)

Phenarsazine Chloride—Color Reaction of. *Reagent.* Mix 25 cc. of 10% aqueous solution of silver nitrate with 25 cc. of glacial acetic acid. *Method.*—Place a small quantity of phenarsazine chloride or oxide in a tube, add 5 cc. of the reagent and heat for ten minutes in a boiling water bath. The coloration is clear yellow with small quantities of Adamsite, but it is slightly greenish yellow then slightly reddish with increasing amounts of the substance. The limit of sensitivity is about 0.02 to 0.04 mg. Paranitrophenarsazine gives a similar reaction. Diphenylamine, which occurs in industrial Adamsite as an impurity, gives a dull green color which quickly changes to black. Adamsite can be detected in water as follows: Add 0.25 Gm. of silver nitrate to 5 cc. of the water, mix to dissolve then add 5 cc. of glacial acetic acid and heat the mixture for 10 minutes in a boiling water bath. The reaction will detect Adamsite in a concentration of 1:125,000.—J. DELGA. *J. pharm. chim.,* 1 (1940), 73–76. (S. W. G.)

Phosphoglyceric Acid—New Method of Determining. The method is based on the considerable increase (60-fold) in optical rotation of 3-phosphoglyceric acid in ammonium molybdate solution. The solution must be freed of compounds such as malic, tartaric or lactic acids in amounts liable to cause interference.—O. MEYERHOF and W. SCHULZ. *Biochem. Z.,* 297 (1938), 60–65; through *Chimie & Industrie,* 41 (1939), 1140. (A. P.-C.)

Phosphoric Ion—Determination of the, by Molybdomanganimetry. In pure solution precipitation is carried out hot in sulfuric acid solution. To prepare the reagent dissolve 50 Gm. of ammonium molybdate crystals and 200 Gm. of ammonium sulfate in 1 liter of water and add 100 cc. of concentrated sulfuric acid, heat 30 minutes on a boiling water bath and filter. Precipitation is carried out on a boiling water bath on a 5 to 40 cc. sample containing 0.01 to 2 mg. of phosphorus. Filtration and washing are carried out on a Thivolle and Fontès platinum gauze microfilter. The precipitate is dissolved in 5% sodium hydroxide solution, the solution is reduced with pure zinc sensitized with a trace of a copper salt, and the molybdenum sesquiozide solution is filtered to remove traces of zinc precipitate and is collected in the phosphomolybdic reagent. The determination is finished in the usual manner. If pyrophosphates or more or less labile phosphoric esters are present, hot precipitation cannot be used owing to the partial hydrolysis of these compounds. In this case a "stabilized nitromolybdic" reagent is used, which is prepared by dissolving 100 Gm. of ammonium molybdate in 400 cc. of water, heating slightly, adding 25 Gm. of tartaric acid, followed after cooling by 100 cc. of concentrated nitric acid and 100 Gm. of ammonium nitrate crystals, and filtering after allowing to stand for a few hours. The determination is carried out as in the preceding case, excepting that precipitation is in the cold. Both methods are applicable to the determination of phosphorus compounds in blood after the necessary defecation.—L. THIVOLLE. *Bull. Bio. Pharmaciens,* (1938), 372–389; through *Chimie & Industrie,* 41 (1939), 1074–1075. (A. P.-C.)

Pineapple Juice—Evaluation and New Monograph for. It is recommended that the method of preparation originally proposed be changed as follows: "Press out the juice from the mixture and heat it in an autoclave for 15 minutes at 15 lb. pressure or for 1 hour on a water bath. Cool and filter." The following test for total invert sugar is proposed: Add lead acetate T.S. to 25 Gm. of the juice in a 100-cc. volumetric flask until the precipitation ceases. Make a solution up to volume with water and filter. Add to the filtrate anhydrous potassium carbonate until precipitation ceases. Filter the mixture and pipette a 25 cc. portion of the filtrate into a 50-cc. volumetric flask. Add 5 cc. of hydrochloric acid and immerse in a water bath with a constant temperature of 70° C. When the temperature reaches 67° C. allow it to stand in the bath for 5 minutes. Remove the flask, cool and make to volume with water. To a 5 cc. portion of this in a 400-cc. resistance glass beaker, add 50 cc. of alkaline cupric tartrate T.S. and 45 cc. of water. Cover the beaker and heat the contents on an asbestos gauze, regulating the flame so that boiling begins in four minutes, after which the boiling is continued for exactly 2 minutes. Filter the precipitate at once upon washed asbestos felts in weighed Gooch crucibles. Wash the precipitate thoroughly with water at 60° C. and finally with 10 cc. of alcohol followed by 10 cc. ether. Ignite for 15 minutes by placing the crucible and contents inside a larger nickle crucible and heating to redness. Repeat this procedure using a blank control. Weigh the precipitates and multiply the weights by 0.8994 to give the amount of cuprous oxide obtained from each solution. The difference in weight should not be less than 150 mg.—KARL B. ROSEN. *Bull. Natl. Formulary Committee,* 8 (1940), 351–353. (H. M. B.)

Piperazine—Determination of. The following procedure gave good results. Dissolve the piperazine in 95% alcohol, add a mixture of equal parts carbon disulfide and ether. Heat gently and allow to stand. If the piperazine is first dissolved in chloroform, simply add an excess of carbon disulfide, heat gently and allow to stand. When the supernatant liquid is clear, filter off the crystals, wash with the proper solvent, dry at 105° and weigh. Results obtained with 0.28–0.52 Gm. of piperazine were within 4 mg. of the theoretical yield. Hexamethylenetetramine does not form a precipitate with carbon disulfide.—A. CASTIGLIONI. *Z. anal. Chem.,* 119 (1940), 118–120. (S. W. G.)

Potassium—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. = 4 Gm. of feces and the mixture contains 40% to 50% of alcohol. The mixture is centrifuged and potassium is determined in the ash from an aliquot portion of the solution.—A. D. MARENZI. *Compt. rend. soc. biol.,* 129 (1938), 1241–1242; through *Chimie & Industrie,* 42 (1939), 33. (A. P.-C.)

Pyrophosphates. A review of the chemical nature and the practical applications of pyrophos-

phates.—F. C. BOWMAN. *Soap*, 16 (1940), No. 4, 23; through *Am. Perfumer*, 41 (1940), No. 4, 85. (G. W. F.)

Quinine Iodobismuthate—Determination of Bismuth, Iodine and Quinine in, and Its Injectable Preparations. *Aqueous preparations. Quinine.*—Place 10 cc. of the filtered liquid in a 150-cc. separatory funnel, add 2.5 cc. of 15% sodium hydroxide solution and extract the quinine by shaking vigorously with 50 cc. and then with 30 cc. of chloroform. Filter the chloroform layers through a pledget of dried, defatted cotton placed in the stem of the funnel and collect the filtrate in a tared beaker. Wash down the walls of the beaker with three 4 cc. portions of chloroform. Evaporate the solvent on a boiling water bath and continue the heating until the residue which at first is oily (ethyl carbamate) becomes white and opaque. Treat the residue twice with 4–5 cc. of ether, remove the ether and dry to constant weight in an oven at 105°. *Iodine.*—To the separatory funnel containing the alkaline solution from the above extraction, add 50–60 cc. of chloroform, acidify by careful addition of 5 cc. of nitric acid which has been cooled to about 4°, stopper immediately and shake vigorously for several minutes. After separation, place a pledget of cotton in the stem of the funnel, draw off the lower layer into a 500-cc. conical flask and wash the liquid in the funnel with two 5 cc. portions of chloroform. Repeat the extraction with 30 cc. of chloroform followed by washing with two 5 cc. portions of the solvent. Add 1–2 Gm. of sodium bicarbonate to the combined chloroform extracts and washings, dilute with 120–130 cc. of 95% alcohol and titrate the iodine with 0.1*N* thiosulfate to the disappearance of color, adding the final portion drop by drop and mixing well after each addition. *Bismuth.*—The nitric acid solution remaining above is transferred or filtered, if necessary, into a 400-cc. beaker, heated to remove the chloroform, almost neutralized with sodium hydroxide solution diluted to about 200 cc. with distilled water and treated with hydrogen sulfide. Collect the bismuth sulfide in a tared crucible, wash with solution of hydrogen sulfide, alcohol, carbon disulfide and ether, respectively, dry at 100° for one hour and weigh. *Solid preparations.*—Place 0.5 Gm. of the compound (accurately weighed) in a 150-cc. separatory funnel, add 5 cc. of 30% sodium hydroxide solution and mix until all the red particles disappear. The small portion adhering to the narrow part of the funnel may be displaced by a strong jet of water (2–3 cc.) from a wash bottle after inverting the funnel. Add 50 cc. of chloroform, shake well for 2–3 minutes and proceed as above. *Oily suspensions.*—Shake 10 cc. of the well mixed suspension with ether. Decant the liquid into a tared No. 4 Schott porous glass filter and wash the precipitate with ether until no oily residue remains on evaporation of a portion of the washings. Dry the precipitate at 100° to constant weight and calculate the strength of the suspension. Use 0.5 Gm. of the dried solid for the chemical analysis as given for solid preparations.—G. N. THOMIS and G. P. KOPANARIS. *J. pharm. chim.*, 30 (1939), 193–200. (S. W. G.)

Resin of Jalap—Chloroform Solubility of. The following procedure for the determination of the solubility of the resin in chloroform is proposed: Add 1 Gm. of the powdered resin, dried over sulfuric acid for three days, to 20 cc. of chloroform in a stoppered flask, shake the mixture occasionally for one hour, let stand over night and again shake occasionally for one hour, filter. Wash the flask and residue on the filter with three successive 5 cc. portions of chloroform, evaporate the combined filtrate in a tared dish and dry the residue to constant weight at 100° C. It weighs not more than 0.32 Gm.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 8 (1940), 383–385. (H. M. B.)

Sherry Wine—New Monograph for. A complete monograph is offered.—R. K. SNYDER. *Bull. Natl. Formulary Committee*, 8 (1940), 357–359. (H. M. B.)

Silver—Volumetric Determination of Small Amounts of, in Body Tissue or Fluid. The organic matter is first destroyed by means of sulfuric acid with a small amount of copper sulfate and nitric acid. Igniting to remove organic matter would cause a volatilization of part of the silver present. The silver present as silver sulfate is centrifuged and washed, and hydrochloric acid is added which converts the silver sulfate to chloride. The silver chloride is also centrifuged and reduced by boiling with formaldehyde (10% solution in potassium hydroxide) to metallic silver. The silver is then dissolved with nitric acid and determined by the Volhard method. In this way amounts of silver down to 0.1 mg. are determined with an accuracy of 1% to 5% or better.—A. CURATOLO. *Atti accad. Lincei*, 28 (1938), 42–45; through *Chimie & Industrie*, 41 (1939), 1075. (A. P.-C.)

Soap Analysis. The tests described are: carbon dioxide, iodine number, matter volatile at 105° C., insolubility in water, screen test, free alkali and sodium pyrophosphate.—REPORT OF COMMITTEE. *Oil and Soap*, 17 (1940), 110; through *Am. Perfumer*, 41 (1940), No. 1, 67. (G. W. F.)

Sodium Acetate—Analysis of. Difficulty was reported in the assay of sodium acetate by distillation from a strongly acid solution and subsequent titration of the distillate. The authors describe the apparatus procedure and the results obtained. Apparatus is illustrated and experimental details given. An all-glass still which eliminates spray is used. Phosphoric acid is added, acetic acid distilled off and then titrated. The method can be adapted to eliminate effect of chlorides and carbonates. Errors reported before are due to faulty apparatus. Speed and precision give an advantage that the U. S. P. XI ashing procedure does not have.—R. M. HITCHENS, G. W. ASHWORTH and W. H. DEMAREE. *Jour. A. Ph. A.*, 29 (1940), 360. (Z. M. C.)

Sodium Thiosulfate Solutions—Preservation of. Chloroform is suggested as a stabilizer but its effectiveness lasts only about three and a half months, requiring a new solution at that time.—F. J. KIRKISH. *Chemist Analyst*, 29 (1940), 68; through *Am. Perfumer*, 41 (1940), No. 4, 71. (G. W. F.)

"Solubility Number" of Soaps. A reprint.—CARLO PEGORARI. *Seifensieder-Zeitung*, 67 (1940), 212–213. (L. K.)

Solution of Ephedrine Sulfate—Optical Rotation of. It is recommended that the observed optical rotation of the solution in a 200 mm. tube at 25° C. is not less than $-1.65°$ and not more than $-2.05°$.—R. K. SNYDER. *Bull. Natl. Formulary Committee*, 8 (1940), 350–351. (H. M. B.)

Syrup of Ammonium Mandelate—Formula and Method of Assay for. A monograph including an assay is offered.—KARL B. ROSEN. *Bull. Natl. Formulary Committee*, 8 (1940), 381–383. (H. M. B.)

Tinctures—Identification of Official, by Capillary Analysis in Wood's Light. The following procedure was used: Immerse a strip of filter paper in the tincture. A chromatic capillary picture is obtained in proportion with the chemical constituents of the preparation. The filter paper must be carefully calibrated, and bands 2 cm. wide by 20 cm. long should be immersed vertically in 25 cc. of the tincture in a crystallization dish having a 2.5 cm. di-

ameter and a height of 2.5 cm. The bands may be immersed for one hour, two hours or twelve hours and should be compared with standard series obtained after equal immersion periods. Observations of the colors noted for portion immersed, band, subfringe and superior fringe are tabulated for fifty-two tinctures. The following fraudulent mixtures may be recognized by examination of immersed strips under Wood's light: Curcuma in tincture of cascara: very brilliant golden-yellow fluorescence. Inula in tincture of digitalis: very intense sky-blue color. Tincture of gentian (yellow, brown); tincture of veratrum (violet-blue, black). Tincture of ipecac (turquoise blue, violet-brown); tincture of false black striated ipecac (dark red or purple, orange, pale blue, cream). Tincture of hamamelis (mastic, brown, blue, cream); *Corylus avellana* (mauve brown, ochre, blue). Belladonna (yellowish green, red, blue, brown, cinnamon); stramonium (lilac-purple, red, chamois brown); ailanthus (gray, red-brown, mauve, sky-blue). Hydrastis (golden-yellow, black); *Coptis teeta* (neutral orange, chamois). Catechu (greenish black); kino (yellowish brown). Colchicum seed (pale blue); colchicum bulb (yellow). The results given above hold for the extracts of the plants.—P. MANCEAU, G. NETIEN and J. FAURE. *Bull. sci. pharmacol.*, 46 (1939), 312–321. (S. W. G.)

Toothpaste Sold in the Philippines—Chemical Analysis of Several Brands of. The authors found the xylol method for determining moisture to be superior to drying to constant weight at 105° C. Moisture content varied from 9.6% to 31.6%; p_H values were determined from a 20% by weight solution in water using the potentiometric method with glass electrode. The p_H of toothpaste is a better index than total alkalinity obtained by titration as a measure of acidity or alkalinity. Majority of samples exhibited slight hardening when heated at 50° C. for 72 hours. Most brands passed through a No. 200 mesh sieve. Other determinations were quite variable.—JOAQUIN MARANON and EDGARDO P. REYES. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 143. (P. A. F.)

Urine—Identification of Medicinal Agents and Poisons in. *Barbiturates.*—Introduce 100 cc. of urine, acidified with several drops of diluted sulfuric acid, into a 250–300 cc. conical flask, add 50 cc. of acetone (technical) and 55–60 Gm. of purified ammonium sulfate. Insure the saturation of the mixture with the ammonium sulfate by shaking or by heating on a water bath below 40°. Cool, transfer the liquid portion to a separatory funnel, avoiding the removal of any of the solid material. Draw off a small portion of the aqueous layer and use this to wash the contents and the sides of the conical flask, adding the liquid to the separator. After several minutes draw off the lower layer completely and then transfer the salted out acetone layer to a 150-cc. conical flask containing 30–35 Gm. of coarsely powdered anhydrous calcium chloride. Make sure that the mixture is acid and let stand for about an hour with frequent shaking. Filter the colorless and dehydrated acetone solution through a small unplaited filter and wash the flask and the filter with several cc. of acetone. Evaporate the acetone in a 60-cc. Pyrex crystallization dish. The residue can be dried and weighed or used for identification reactions. The residue can be purified by sublimation. *Arsenic.*—Measure 100 cc. of urine into a 250-cc. flask, add 10 cc. of hydrochloric acid and 25 cc. of a saturated aqueous solution of potassium chlorate, then heat over a moderate flame. The liquid which is first colored brown becomes colorless on boiling. If the decoloration is not complete add small portions of the potassium chlorate solution. After boiling for a few moments allow to cool, add 10 cc. of 10% magnesium chloride solution, neutralize with ammonium hydroxide solution, then add 20 cc. of the ammonium hydroxide solution and let stand in the cold for at least an hour. Recover the precipitate on an unplaited filter and wash with 100 cc. of 10% ammonium hydroxide solution. Place the funnel and filter on a 120-cc. wide-mouth bottle, dissolve the precipitate with 80 cc. of 20% sulfuric acid adding the acid in small portions. Determine the arsenic in the bottle according to the method of Cribier (Thesis, Univ. of Paris, Duval), comparing the brown stain formed on the mercuric chloride paper and fixed to potassium iodide with a series of stains prepared under the same conditions. The reagents should be free from arsenic, as samples of normal urine may have less than 0.01 mg. of arsenic per 100 cc.—R. FABRE and A. CISMARU *J. pharm. chim*, 1 (1940), 137–140. (S. W. G.)

Zinc Stearate—Ointment of. Adaptation of Assay Methods for Some N. F. Ointments. The assay method for zinc stearate may be successfully adapted for the assay of ointment of zinc stearate. The base is composed of liquid petrolatum and white petrolatum. Upon ignition, they are carbonized along with the stearic acid and palmitic acid portions of the zinc stearate, leaving a residue of zinc oxide which is determined titrimetrically. A method is given and it is recommended that it be adopted for admission to the National Formulary and that the following standard be prescribed: Ointment of Zinc Stearate contains not less than 4.2% and not more than 5.8% of ZnO.—WM. B. BAKER and D. I. KUTZLY. *Jour. A. Ph. A.*, 29 (1940), 397. (Z. M. C.)

PHARMACOGNOSY

VEGETABLE DRUGS

Aloe. A pharmacognostic review of the various species of Aloe is given.—E. FLACCOMIO. *Il farm. ital.*, 7 (1939), 217. (A. C. DeD.)

"ates," Anona Squamosa L.—Phytochemical Study of the Seeds of. *Anona muricata* (guanabanos), *A. reticulata* (anonas), *A. squamosa* (ates or atis) are the three plant species of the genus *Anona* which are cultivated throughout the Philippines. The author refers to the work of Santos in isolating from the bark of "anonas" and "ates" about 0.02% of the alkaloid, anonaine, $C_{17}H_{17}O_3N$. In this investigation, about 674.5 cc. of a yellowish fixed oil was extracted from the ground seeds of "atis" by refluxing with petroleum ether, representing about 12.5% of the original seeds. The oil becomes water color after decolorization with Fuller's earth, becoming yellowish again after some time. Animal charcoal was found to be almost ineffective. The oil gave the following constants: sp. gr. 0.815 at 30° C.; refractive index 1.458 at 20° C.; congealing point 3° C.; Hamus iodine number of 71.43; acid number 8.153; saponification value 145; ester value 139.29. The author deduces that the oil consists essentially of the glyceryl ester of oleic acid. The presence of an alkaloid in the bark of *A. squamosa* (ates) was demonstrated. The oil appears to be effective as a hair tonic and lice exterminator.—GUILLERMO Q. QUIBILAN. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 154. (P. A. F.)

Athyrium Filix-Fœmina—Study of. Reports in the literature that roots, rhizomes and stipes of *A. filix-fœmina* have anthelmintic properties led to its investigation. Differences in structure between *Athyrium filix-fœmina* and *Dryopteris felix-mas* are shown. Claims for toxicity of *A. felix-fœmina* and presence of filicic acid in the rhizomes seem unwarranted. Results of experiments indicate that

the rhizome nor its extracts have athelmintic value.—MALCOLM S. TRUPP and FOREST J. GOODRICH. *Jour. A. Ph. A.*, 29 (1940), 286. (Z. M. C.)

Belladonna, Digitalis, Hyoscyamus and Stramonium Leaves—Value of Palisade Ratios in the Differentiation of Official. Since the palisade ratio has been found to be fairly constant and of diagnostic value, a study was made to determine whether it would be of value in the microscopic differentiation of the leaves of plants mentioned. They found the ratios of practically no value in differentiating hyoscyamus, digitalis and stramonium. It is possible to use the ratio of the official belladonna leaves as a means of distinguishing them from hyoscyamus, digitalis and stramonium leaves.—BERNARD S. FEINSTEIN and FRANK J. SLAMA. *Jour. A. Ph. A.*, 29 (1940), 370. (Z. M. C.)

Capsicum from Italian Somaliland. A variety of *Capsicum frutescenes* L. is cultivated in Italian Somaliland and the neighboring countries. The fruit is from 2.5 to 4 cm. long and 1 to 1.5 cm. broad, laterally flattened, with a color varying from yellowish red to reddish violet. It is grown in rich sandy soil. The fruit can be gathered in four months after sowing and the cropping continues for two to six months according to the locality, with about three collections a month. The fruits are dried in the air and in the sun, or in drying ovens at 45°. The average yield is 1400 Kg. per hectare but may reach 3000 Kg. The amount of capsaicin determined on quantities of 200 Gm. of drug according to the methods of Micko and of Lapworth and Royle was between 0.075% and 0.085%. Although authorities disagree as to the amount of capsaicin which is present in capsicum fruit, this proportion indicates quite good activity. The samples also complied with the U. S. P. X test for pungency and gave 12.6% of nonvolatile ether extract by the U. S. P. X method. This variety is therefore suitable for medicinal use.—C. ALBERTI. *Ann. chim. appl. Roma*, 29 (1939), 392; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 779. (S. W. G.)

Cinchona Bark Industry. I. While it is considered hardly possible to compete with the cinchona industry of the Netherlands East Indies, much thought has been directed recently to the possibility of providing the febrifuge for the local inhabitants of the various British colonies. Apart from Inida the most promising parts of the Empire for cinchona production appear to be Malaya, Tanganyika and the Cameroons under British Mandate. The use of the mixed alkaloids "totaquina" instead of quinine has suggested the possibility of the cultivation of species less exacting in their soil and climate requirements than *Cinchona ledgeriana*. The total alkaloidal content and the percentages of the individual alkaloids in the different species of cinchona are tabulated. The cultural requirements and alkaloidal contents of the more common species and hybrids are discussed. Details of the production of bark and quinine in the Netherlands East Indies and in India are given.—ANON. *Bull. Imp. Inst. Long.*, 37 (1939), 18; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 638. (S. W. G.)

Cinnamon and Cassia—Quantitative Determination of, in the Form of Powder. *Cinnamon.*—Thoroughly mix about 0.1 Gm. of the No. 85 powder with about 0.05 Gm. of lycopodium, both being accurately weighed. Transfer the mixture to a small corked glass tube and clear, using 3 to 3.5 cc. of chloral hydrate 5:2 solution; and then make up to about 10 cc. with the suspending fluid (mucilage of tragacanth 1 volume, glycerin 2 volumes, water 2 volumes). Prepare mounts from the homogeneous suspension and determine the area of the fibers by the procedure in the B. P. C. 1934, Appendix IX, p. 1592. The mean area of fibers per Gm. of the powdered cinnamon, dried at 100° was 92.5 sq. cm. *Cassia.*—With powdered cassia bark prepared as above the mean of the results which represents the area per Gm. of the sample dried at 100° is 13.0 sq. cm. Cassia is detected in cinnamon powder by its larger fibers (over 30 microns in diameter) and bigger starch grains (over 10 microns in diameter) than those of cinnamon. By using the data based on the area of the fibers, the amounts of the two barks in admixture can be computed indirectly according to the following formula: $X = \frac{C - M}{C - K} \times 100$ where C is the area of fibers per Gm. of cinnamon; M is the area of fibers per Gm. of the mixture; K is the area of fibers per Gm. of cassia. The following summary is given: (1) For barks in which the fibers occur isolated or in the form of files, the area of fibers per Gm. of the powdered bark is an excellent criterion for determining the amount of these drugs in the form of powder. (2) This datum for cinnamon is 92.5 and for cassia is 13.1, figures which differ so widely that they can be used successfully in determining the amount of cassia in cinnamon or *vice versa*. (3) The area of fibers per Gm. of cinnamon is in direct relation with its quality and grade, the best quality is about 100 and the lowest, *viz.* featherings and chips, is 40 to 70. (4) Samples of cinnamon that give lower results than those of quills may be either adulterated or of inferior quality; both types are unofficial and when no adulterant can be detected one may report the sample as either inferior or as not conforming with the requirements of the pharmacopœia.—A. H. SABER. *Quart. J. Pharm. Pharmacol.*, 13 (1940), 7–13. (S. W. G.)

Fraxinus Sieboldiana Blume (Oleaceæ) Bark—Constituent of. Aqueous extract of the bark of *Fraxinus Sieboldiana* Blume exhibits a marked bluish fluorescence. Addition of ammonia to the solution intensifies the fluorescence and at the same time changes the color to yellow. This fluorescence phenomenon is due to æsculetine, the chief constituent of the extract.—H. SHIMADA. *J. Pharm. Soc. Japan*, 58 (1938), 185–187; through *Chimie & Industrie*, 41 (1939), 1145. (A. P.-C.)

Glottidium Vesicarium (Jacq.) Harper—Chemical Investigation of the Seeds of. Available data concerning this weed commonly called the Coffee Bean Weed have been reviewed. The beans are commonly reported as toxic but this could not be substantiated. The fatty oil was examined and negative tests for alkaloids and glucosides were obtained. Positive tests for saponin were obtained but attempts to isolate it failed, apparently because it was hydrolyzed. Hydrolysis products were obtained by refluxing an alcoholic-aqueous extract with 5% hydrochloric acid.—P. A. FOOTE and L. G. GRAMLING. *Jour. A. Ph. A.*, 29 (1940), 311. (Z. M. C.)

Hamamelis—Varieties of, Pharmacognosy of the Leaves of. I. A review of the pharmacognosy of the leaves of various varieties of *Hamamelis*. Diagrams and illustrations are given in the Japanese text and their titles are given in the Transactions.—YUTAKA YOSIDA. *J. Pharm. Soc. Japan*, 59 (1939), 582–604 (in German, 174–177). (N. L.)

Litmus—New Monograph for. A complete monograph is proposed and experimental data leading to the recommendations included therein are offered.—RAYMOND ADAMSON and E. H. WIRTH. *Bull. Natl. Formulary Committee*, 8 (1940), 376–379. (H. M. B.)

Medicinal and Poisonous Plants—Preliminary Survey of. The Philippine Dumagat regions in

Infanta, Tayabas and the Negrito regions in Mount Labo, Camarines Norte, were surveyed for medicinal and poisonous plants, during April and May 1939. Approximately 40 species were secured and recorded. A great number of the specimens, including four species used by the Dumagat as Gayuma, are supplied with roots, bark and botanical specimens. Plants were properly identified and checked, the samples turned over to the Office of the National Research Council for chemical analysis.—MAMERTO D. SULIT. *Nat. Res. Council Philippines Bull.*, 23 (1939), 141. (P. A. F.)

Medicinal Plant Culture in the United States—Brief History of. Salient points in this paper are chief reasons for the desire to grow medicinal plants, species adapted to soil and climatic conditions, the effect changing trends in medicine and our economic life have had on possibilities of medicinal plant culture. Cultivation of some plants is discussed in more detail: ginseng and goldenseal, peppermint, chenopodium, wormwood, digitalis henbone, beladonna, levant wormseed, mustard and red pepper. Historical phases are emphasized.—A. F. SIEVERS. *Jour. A. Ph. A.*, 29 (1940), 408. (Z. M. C.)

Pittosporum Undulatum—Chemical Examination of Fruit of. The non-volatile constituents of the fruit of *P. undulatum* Ventenat, the "mock orange," were extracted from the ground, dried material by successive treatment with ether and hot dilute alcohol (50%). The ethereal extract consisted of fats and two unsaponifiable crystalline substances. The first, which had m. p. 51–52°, was present in too small a quantity for identification; the second was identified as the paraffin pentatriacontane. The alcoholic extract contained a leucoanthocyanin and a saponin. A portion of this crude extract after hydrolysis yielded pittosapogenin ($C_{30}H_{50}O_7$), glucose, galactose and mannose.—J. W. CORNFORTH and J. C. EARL. *J. Proc. Roy. Soc. N. S. W.*, 72 (1939), 249; through *Quart J. Pharm. Pharmacol.*, 12 (1939), 624. (S. W. G.)

Strophanthus Cumingii A. DC. Natives of the Philippines use the bark of *S. Cumingii* as an arrow poison. The gross morphology and the histology of all members of the plant are described. The seeds are oblong-lanceolate and generally similar in form and dimensions to those of other species of *Strophanthus;* the testa is light-brown and glabrous, with longitudinal striations. With strong sulfuric acid the narrow endosperm becomes pink and later greenish and finally brownish; the cotyledons show a similar color reaction. The paper is illustrated by numerous excellent drawings and photographs.—J. K. SANTOS. *Rev. Filipina*, 30 (1939), 365; through *Quart. J. Pharm. Pharmacol.*, 13 (1940), 84. (S. W. G.)

ANIMAL DRUGS

Beeswax—Characteristics, Contaminants and Processing of. Sixty samples of California wax are studied. The relationship between pollen species and beeswax color is discussed. Effect of metals on beeswax is mentioned. Clarification with oxalic acid, with thorough washing has little effect on acid value. Eight references.—G. H. VANSELL and C. S. BISSON. *U. S. Dept. Agric. Bull., Bur. Entomol. Plant Quarantines* E-495, (1940), 11 pp.; through *Am. Perfumer*, 41 (1940), No. 4, 87. (G. W. F.)

GALENICAL

Acetylsalicylic Acid—Notes on the Stability of. The loss of acetylsalicylic acid in saturated alcoholic and acid-alcoholic solutions as well as in suspension has been estimated. Acetylsalicylic acid (3%), when dissolved in 50% alcohol and kept under ordinary laboratory conditions loses about 1.5% per day, 6.0% to 6.5% per week and 13.5% to 14.5% per month. A suspension of the same strength and kept under the same conditions loses 0.3% per day, 1.6% to 2.0% per week and 7.0% to 8.0% per month. Suspensions should be prescribed and dispensed in preference to solutions containing solution of ammonium acetate or similar preparations, and where administration of tablets is not desired. Two charts are given which plot: (1) percentage loss of suspension × 10 against percentage loss of saturated solution, and (2) percentage loss against loss of acetylsalicylic acid in 3% suspension and solutions. A table is also given showing the losses that occur over a period of 28 days.—H. W. TOMSKI and L. J. WALLER. *Pharm. J.*, 144 (1940), 53. (W. B. B.)

Ascorbic Acid—Stability of Dissolved. The stability of ascorbic acid in solution in water and in biological fluids when exposed to air depends on the presence of auxiliary substances. In ammonium phosphate and ammonium citrate buffer solutions, disappearance of ascorbic acid by oxidation is appreciably greater in acid than in alkaline medium, and also greater in presence of citrate than it is in presence of phosphate. Potassium cyanide exerts a protective action on ascorbic acid; its protective action, however, is very slight in urine or in broth. Potassium thiocyanate and potassium iodide also act as protective agents (except in urine).—J. LEIBOWITZ and K. GUGGENHEIM. *Z. Vitaminforsch.*, 8 (1938), 1–7; through *Chimie & Industrie*, 41 (1939), 1148. (A. P.-C.)

Bleach Ointment—Preparation and Storage of. Milled samples of bleach ointment made from "tropical" bleaching powder and a commercial white petroleum jelly (iodine value 7.2) have been found to contain some 14% to 15% of available chlorine. The chlorine content is higher when B. P. white soft paraffin is used (iodine value 4.5). A fairly rapid loss in available chlorine during the first few days is followed by a much slower deterioration, and even under unfavorable conditions a specimen was found to contain 11% of available chlorine after three months. A number of substances added in small quantity are found to have no appreciable influence on the stability of the ointment, but a trace of glycerin induces decomposition and heat. Glycerin must be excluded from treatment of injuries if bleach ointment is to be used. Four tables are given as a convenient method of tabulating the data collected.—A. G. FISHBURN. *Pharm. J.*, 144 (1940), 35. (W. B. B.)

Coconut Oil Soap B. P. C. The present formula will never produce a stable clear product. A modified formula in which caustic soda is replaced by potash is suggested. The formula follows: Coconut oil 5 lb., caustic potash 1 lb., oil lavender to suit and distilled water to 18 pints. Method of manufacture is to melt the oil, add 35 ounces of potash solution containing the one pound of potash, mix well, keep warm for one week, then add remainder of water, dissolve by warming further, place into separators and after 24 hours draw off clear material through filter paper.—C. L. SPAIN. *Chem. Products*, 3 (1940), 31; through *Am. Perfumer*, 41 (1940), No. 4, 79. (G. W. F.)

Compressed Tablets—Problems Encountered in the Manufacture of. The problems discussed are binding, picking, capping, sticking and splitting and to be helpful the paper needs to be read in its entirety.—L. W. BUSSE and A. H. UHL. *Jour. A. Ph. A.*, 29 (1940), 415. (Z. M. C.)

Cranberry—Syrup of, New Pharmaceutical Vehicle. The cranberry, *Vaccinium macrocarpum* deserves attention as the source of a potential pharmaceutical vehicle. Review of the literature shows

the use of a syrup in 1895, gives chemical constituents of the juice, points out that the red color is affected by tin and iron and slightly by copper and nickel, that long storage in bottles in the light causes fading and precipitation. Experimental work is reported. Two methods for preparing syrup are given, one involving cold expression of the juice being preferable. Estimated average cost, exclusive of labor is not over 25 cents per L. Potassium acetate, sodium citrate and alkalies cause a color change in the syrup. The syrup is an efficient vehicle for chloral hydrate, potassium acetate and ammonium chloride. It is compatible with most alcoholic preparations. It does not spoil readily because of high sugar content, acidity or mildly bateriostatic substances such as benzoic acid, present in the cranberries.—J. A. LUBITZ, C. R. FELLERS and J. A. CLAGUE. *Jour. A. Ph. A.*, 29 (1940), 323. (Z. M. C.)

Mercuric Nitrate—Ointment of. Though Ointment of Mercuric Nitrate has been in use for many years and though the formula has been changed many times, no stable preparation has been developed. The ointment made by the N. F. VI formula has the highest antiseptic potency of any U. S. P. or N. F. ointment at the present time. Report is made of experimental work which has produced a stable ointment. An aqueous mercuric nitrate phase is dispersed in a cholesterol-petrolatum base capable of holding large quantities of aqueous solutions or suspensions in a rather permanent form. Following is the formula: mercuric nitrate 11.34 Gm., nitric acid 1.35 Gm., distilled water 32.31 Gm., white wax 5.00 Gm., cholesterol 1.50 Gm., white petrolatum 48.50 Gm. To make 100.00 Gm. Mix 11.34 Gm. of finely powdered mercuric nitrate with 1 cc. of water, preferably in a mortar, and add 1.35 Gm. of nitric acid, accurately weighed. Triturate in the mortar until solution is effected and add 31.31 Gm. of water, slowly and with constant stirring. Melt the white petrolatum, the cholesterol finely powdered and the white wax in a suitable dish. Continue the heat until the temperature of the mixture is raised to 80° C. and the cholesterol has completely dissolved. Stir the mixture until it congeals. By trituration, slowly incorporate the aqueous solution of mercuric nitrate into the ointment base. Care should be taken to avoid contact with metallic instruments or containers. The finished ointment has the same mercuric nitrate content as that of N. F. VI. At first it is snow white, later becoming light yellow permanently. It has three times the potency of the N. F. one when tested against *Staphylococcus aureus* and is superior in consistency and texture.—RUDOLPH A. KUEVER and CARL B. BURNSIDE. *Jour. A. Ph. A.*, 29 (1940), 325. (Z. M. C.)

Saponated Solution of Cresol—Rapid Procedure for the Manufacture of. Some objectionable features of the official formula are variability of time required for its preparation, use of two alkalies, probable loss of cresol due to prolonged heating necessary to complete the reaction. Experimental work reported aimed to eliminate some of these objections. The following formula was devised: cresol 500 cc., sodium oleate or sodium stearate 240 Gm., distilled water, q. s. ad to make 1000 cc. Dissolve the soap in the cresol, to which about 200 cc. of distilled water have been added. Heat the mixture, with constant stirring, to about 65° C., and maintain this temperature until solution is effected. Cool the liquid, add sufficient distilled water to make the product measure 1000 cc. and mix well. Sodium oleate or stearate may be used. Very little heat is required so high cresol content is insured. Because of short heating time the product is much lighter in color. Since light affects color, it should be protected from light. Gelatinization does not occur regardless of grade of cresol. Cause of gelatinization is not certain. It may be due to too much soap or too much heating.—LOWELL F. MARTIN and WILLIAM A. PROUT. *Jour. A. Ph. A.*, 29 (1940), 327. (Z. M. C.)

Solution of Tannic Acid and the Preservation of Tannic Acid. Sodium bisulfite (0.1%) has been found to be a better preservative of the color of the solution than sodium sulfite or salicylic acid. It was ineffective in concentration of 0.01%.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 8 (1940), 379–381. (H. M. B.)

Tannic Acid U. S. P. III. Hydrogen-Ion Studies of Tannic Acid Solution. Because of the deterioration of aqueous solutions of tannic acid, a study of hydrogen-ion values was undertaken on fresh solutions, on solutions stabilized by the method suggested by Fantus and solutions with other stabilizers. The rate of change in hydrogen-ion concentration was studied. Ethyl and propyl *para* hydroxy benzoates exhibited a stronger stabilizing power than the corresponding methyl and benzyl esters. The authors believe that the recommended stabilizing agents do not produce the desired effect.—CLIFTON E. MILLER and L. WAIT RISING. *Jour. A. Ph. A.*, 29 (1940), 396. (Z. M. C.)

Tikitiki—p_H Value of Extract of. Determinations on 5 plants gave p_H values from 3.8 in the case of an old extract to 5.23 in the case of new. Therefore, the extract should not be kept for an appreciable length of time.—AMADO SANTOS. *Proc. Fifth Sci. Convention Nat. Res. Council Philippines Bull.*, 23 (1939), 150. (P. A. F.)

Tincture of Iodine—Deterioration of, Due to Rubber Stoppers. Tincture of iodine stored in glass-stoppered bottles under ordinary conditions shows no essential change in iodine content or any darkening of the residue over a period of a year and a half. The official assay for potassium iodide content in our experience has been satisfactory for control analysis, in fact if a titration method had been employed the discolored residue in all likelihood would not have been discovered. Criticism should be directed, not at the method because of the contaminated residue, but at the commercially packaged preparation. It is the opinion of the writers that glass stoppers meet the U. S. P. requirement for preservation of this product in bottles closed with stoppers resistant to corrosion, and that rubber stoppers do not meet this requirement.—JOSEPH F. McDONNELL, JR. and PHILIP M. FAIRLAMB. *Am. J. Pharm.*, 112 (1940), 323. (R. R. F.)

NON-OFFICIAL FORMULAS

Calcium Gluconate—Solutions of, with Cacodylates, Glycerophosphates and Other Salts. The author has shown previously that supersaturated solutions of calcium gluconate at 10% or 20% can be stabilized by the addition of 5% of magnesium thiosulfate. The association of cacodylates, glycerophosphates and formates with calcium gluconate has presented difficulties previously because the heat used in sterilization has caused decomposition with the formation of precipitates, but the addition of 2% of magnesium thiosulfate enables the ampuls to be heated for half an hour at 100° without alteration. The author gives many formulas, of which the following is an example: calcium gluconate 20 Gm., iron glycerophosphate 5 Gm., sodium glycerophosphate 5 Gm., magnesium thiosulfate 3 Gm., water to make 150 cc. Dissolve the calcium gluconate and the magnesium thiosulfate in 50 cc. of water by means of heat and filter; dissolve the other salts in 50 cc. of water and neutralize exactly with 0.1N lactic acid or hydrochloric

acid, mix the two solutions and make up to 150 cc. with water. Great care must be taken in cleaning the ampuls so that no particles which could serve as a nucleus for crystallization are left.—A. FERRARIS. *Boll. chim.-farm.*, 78 (1939), 175; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 639. (S. W. G.)

Cod Liver Oil Ointments and Suppositories. The local application of cod liver oil for wounds, burns and other morbid conditions of the skin has had very good results and the following formulas are useful. The waxes and other ingredients are melted first and the cod liver oil added gradually at a temperature of 30–35° avoiding the formation of air bubbles. (*a*) White beeswax 10 Gm., spermaceti 10 Gm., cod liver oil 80 Gm., alcholic solutions can be added to this; (*b*) yellow beeswax 20 Gm., soft paraffin 50 Gm., cod liver oil 40 Gm., this is very suitable for wounds and sores; (*c*) beeswax 20 Gm., stearic acid 20 Gm., soft paraffin 30 Gm., hydrous wool fat 30 Gm., cod liver oil 100 Gm., aqueous medicaments can be added to this; (*d*) yellow beeswax 10 Gm., triethanolamine stearate 10 Gm., hydrous wool fat 25 Gm., cod liver oil 75 Gm., talc or zinc oxide can be added to this to increase its curative and cicatrizing actions. These may all be spread directly on the skin or on gauze. The following are good formulas for suppositories and pessaries: oily medicaments can be added to the first, and aqueous liquids to the second; (*e*) beeswax 1.5 Gm., oil of theobroma 4.5 Gm., cod liver oil 4.0 Gm.; beeswax 3 Gm., triethanolamine stearate 4 Gm., cod liver oil 20 Gm.—A. FERRARIS. *Boll. chim.-farm.*, 78 (1939), 379; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 642. (S. W. G.)

Cosmetic Manual. Face Powders. The properties of a good face powder are discussed and twenty-two formulas offered.—JOSEPH KALISH. *Drug Cosmetic Ind.*, 47 (1940), 266–267. (H. M. B.)

Cosmetic Manual. Hair Dressings. These preparations are liquid and solid brilliantines (including pomades), hair creams and other preparations to keep the hair in place, to give a luster and appearance of good grooming. Liquid brilliantines (14 formulas), solid brilliantines (17) and creams (7) are discussed.—JOSEPH KALISH. *Drug Cosmetic Ind.*, 47 (1940), 398–399. (H. M. B.)

Cosmetic Manual. Thirty-Four Depilatories. The problem of depilatory action is that of destroying or softening hair so that it may easily be removed from skin surfaces. Depilatories should be rapid in action, with mild odor and stable. Those in the form of powders (17 formulas), pastes (8), solutions (2) and waxes (7) are discussed.—JOSEPH KALISH. *Drug Cosmetic Ind.*, 47 (1940), 148–150. (H. M. B.)

Cosmetics for Hands and Feet. Formulas are given for whitening hand cream, protective cream, cream with lanette wax SX, boro-glycerin-lanolin cream and cholesterol cream. There are brief discussions on perfuming of hand creams, care of the finger nails and nail polish.—H. JANISTYN. *Seifensieder-Zeitung*, 67 (1940), 215. (L. K.)

Dermatitis Control. Dermatitis may develop due to allergy or to decreased threshold of skin resistance to irritation by liberated alkali. Eight formulas are given for hand protecting creams. A formula for an abrasive soap contains 45 parts mineral oil, 45 parts sulfonated neatsfoot oil with 10 parts of a 25% gelatin solution or 10 parts of cornmeal.—J. KLAUDE. *Ind. Med.*, 9 (1940), 221; through *Am. Perfumer*, 41 (1940), No. 4, 89. (G. W. F.)

Eye Lotions. Several formulas for eye lotions are given.—ANON. *Indian and Eastern Chemist*, 21 (1940), 166. (A. C. DeD.)

Face Creams—Non-Fatty. To reduce greasiness, include inert pulverulent materials such as titanium dioxide, zinc oxide, calamine, talc, colloidal kaolin and bentonite. Other substances are starch, methylcellulose and sodium alginate. Five formulas are included.—J. M. VALLANCE. *Am. Perfumer*, 41 (1940), No. 2, 27–29. (G. W. F.)

Quinine—Oily Solutions of, for Hypodermic Use. Oily solutions of quinine are indicated for hypodermic use in bronchitis, pleurisy and influenza, but it is difficult to give a sufficient dose owing to the insolubility of quinine in fixed oils. This can be got over by using oleic acid, but the injections are painful and moreover the quinine is not administered in the free state. The addition of essential oils greatly increases the solubility of quinine, and by the use of guaiacol stable 10% solutions can be obtained. Ten Gm. of anhydrous quinine is heated in a porcelain dish with 10 Gm. of guaiacol until a liquid mixture is obtained, then 20 Gm. of neutral oil is added and the whole heated on a water bath for half an hour; sufficient oil to make 100 cc. is then added and the mixture filtered. Substances like camphor, eucalyptol and menthol can also be added. It is important that the quinine should be dry, otherwise the solution will become cloudy. As the guaiacol is an anesthetic the injections are painless if they are injected warm and sufficiently deep.—A. FERRARIS. *Boll. chim.-farm.*, 78 (1939), 173; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 640. (S. W. G.)

Stearyl Alcohol. Stearyl alcohol possesses all the good points of cetyl alcohol and in some respects is superior. It has a higher melting point and consequently less is required to increase the viscosity and stability of toilet creams. The cold cream of the Swiss Pharmacopœia is said to be difficult to prepare and tends to exude water. A better product is obtainable by the use of stearyl alcohol as follows: Stearyl alcohol 20 Gm., lanolin B. P. 50 Gm., soft white paraffin B. P. 430 Gm., olive oil B. P. 40 Gm., rose water 460 Gm., rose oil 20 drops. The lipoids are melted together and the rose water run in slowly, with constant stirring. When cool the perfume is added and the cream kneaded *in vacuo*.—H. S. REDGROVE. *Chem. Products*, 1 (1939), 111; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 644. (S. W. G.)

Toothpaste. A composition made, for example, by heating 20 parts casein with 100 parts water brought to p_H 8–9 with trisodium phosphate solution, to which is then added 60 parts tricalcium phosphate and 4 parts gum tragacanth. The whole is dried and brought to paste form with glycerin.—U. S. pat. 2,154,168; through *Am. Perfumer*, 41 (1940), No. 4, 83. (G. W. F.)

DISPENSING

Cinchona Extract—Preparation of. Published work is discussed and the influence of varying concentrations of formic acid and ethanol in the medium on the alkaloid content of the extract obtained by percolation is examined. Formic acid (1.00% to 1.25%) increases the alkaloid content, but variations of ethanol concentration between 46% and 75% have little effect.—C. BÉGUIN. *Pharm. Acta Helv.*, 13 (1938), 362–377; through *Chimie & Industrie*, 42 (1939), 317. (A. P.-C.)

Dispersions and Emulsifiers. As example, 10 parts monoglycol stearoylglycolate are mixed with an acid, resulting from the interreaction of equimolecular quantities of sodium stearate and glycol chloracetate, to which are added 0.8 parts potassium hydroxide 35° Bé; 20 parts petroleum jelly and 60 parts water.—British pat. 511,043; through *Am. Perfumer*, 41 (1940), No. 4, 77. (G. W. F.)

Emulsifying Agent. A halogen substituted olefin is treated with a strong acidic sulfonating agent followed by addition of water, boiling the mixture and treating with alkali. An alkyl hydroxysulfonate is produced in this manner.—U. S. pat. 2,195,581; through *Am. Perfumer*, 41 (1940), No. 4, 77. (G. W. F.)

Enteric Coating for Pills, Capsules or Tablets and the Like. Use is made of a stearic acid-phthalic anhydride-glycerol condensation product.—ERNEST H. VOLWILER and MARJORIE B. MOORE, assignors to ABBOTT LABORATORIES. U. S. pat. 2,205,111, June 18, 1940. (A. P.-C.)

Eye Waters—Investigation of the Cottony Material Developing in Certain. The flocculent material developing in zinc sulfate and boric acid eye water was found to consist of living organisms. The chief source of contamination was the distilled water obtained from a contaminated storage tank and other sources may be unsterile corks, filter paper or apparatus. Zinc sulfate and boric acid stimulate the growth of the organisms but are not a source of contamination. Two species of organisms were found to be the chief contaminants of the distilled water, a *Fusarium* and a *Torula* species.—DONALD M. SKAUEN and GEORGE L. BURROUGHS. *Pharm. Arch.*, 11 (1940), 72–80. (H. M. B.)

Gelatin—Emulsifying Properties of. Two types of gelatin are available. One type is adaptable for use in emulsions containing 40–60% oil. The following formula is suggested: gelatin 8 grams, tartaric acid 0.6 grams, alcohol 60 cc., flavor as desired, syrup 100 cc. and water to make 500 cc.—ANON. *Alcohol News*, (Sept. 1940); through *Am. Perfumer*, 41 (1940), No. 4, 79. (G. W. F.)

Hydrogenated Fats—Use of, in Preparation of Ointment Bases for Tropical Countries. The following conclusions are given: (1) Hydrogenated palm kernel oils, melting point 40° to 42° is a suitable fat to replace lard and suet in ointments in tropical countries. (2) By altering the degree of hydrogenation the melting point of the hydrogenated fat can be altered. (3) It shows little tendency to become rancid. (4) A mixture of hydrogenated palm kernel oil with 12.5% of soft paraffin forms a suitable ointment base for use in Malaya, where absorption or penetration of the ointment is required.—A. F. CALDWELL. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 689–698. (S. W. G.)

Ointment Vehicles for Antiseptics. A brief consideration of the use of the older ointment vehicles is given. Conditions necessary to regard an ointment base as ideal are mentioned. A survey of the newer ointment and absorption bases, in which the active agents are members either of the oxycholesterin or waxy groups or are ethanolamines or members of the higher fatty alcohol group, is presented. The action and efficiency of ointment bases are considered. References are given. The newer ointment vehicles, including the so-called absorption bases, make possible preparations which are therapeutically more efficient, cosmetically more pleasant, and in general more desirable in most cases than the same preparations prepared with the older bases as the vehicles. Formulas for these newer ointment bases, as vehicles for antiseptics and other therapeutic agents, should be made available only after they have given satisfactory *in vitro* tests. Such formulas should be continued in use provided reports of *in vivo* tests are satisfactory. Interpretation of inhibition zones, when such bases containing antiseptics are tested by the F. D. A. Plate and Cup Plate techniques, is suggested as a method of determining the *in vitro* efficiency of ointment vehicles. Finally, recommendations are made that the Pharmacopœial Revision Committee arrange for a thorough study of "Ointment Vehicles," considering especially the newer absorption bases, present formulas which appear most satisfactory, determine their *in vitro* efficiency, and attempt to obtain wide use of such formulas over the country by dermatologists, who are to be requested to report on the results of their use.—L. GERSHENFELD. *Am. J. Pharm.*, 112 (1940), 281. (R. R. F.)

Phenylmercuric Borate. By evaporating to dryness in vacuum an alcoholic solution containing equimolecular proportions of phenylmercuric hydroxide and boric acid, a phenylmercuric borate is obtained, melting at 112° to 113°, that is suitable for use in salves, etc.—WALTER G. CHRISTIANSEN, assignor to LEVER BROS. CO. U. S. pat. 2,196,384, April 9, 1940. (A. P.-C.)

Picric Acid Solutions—Note on the Dispensing of. A saturated picric acid solution (1.4 Gm. per 100 cc.) is recommended for the preparation of solutions of picric acid.—A. F. CALDWELL. *J. Malaya Branch Brit. Med. Assoc.*, 3 (1939), 107; through *Chem. Abstr.*, 34 (1940), 3876. (F. J. S.)

Quinine—Incompatibility of. Guaiacol and its compounds are incompatible in concentrated solutions with salts of quinine. This incompatibility does not seem to be described in the pharmaceutical literature. The reaction between the two substances is attributed to the formation of a guaiacholate of quinine.—C. H. LIBERALLI. *Gazeta Pharm.*, 8 (1939), 24. (G. S. G.)

Suppositories—Preparation of. A good method is that of Gualdoni. The finely powdered medicament is mixed thoroughly with one-third of the cocoa butter. The remainder is melted, and the mixture is added. The mass is cooled to 28° before pouring. If beeswax is added to cocoa butter to raise the melting point the right quantity must be added. Less than 3% lowers the melting point; above 5.66% the melting point is above 37°. With spermaceti, up to 20% lowers the melting point; and more than 28% brings it above 37°.—A. JERMSTAD and B. FRETHEIM. *Medd. Carlsberg Lab.*, 2 (1940), 2; through *Quart. J. Pharm. Pharmacol.*, 13 (1940), 186. (S. W. G.)

Suppository Bases—Composition of, for Tropical Countries. The following conclusions are given: (1) The addition to cocoa butter of substances which are soluble in fats rapidly lowers the melting point and also lowers the transition temperature. (2) The use of hardening agents such as beeswax is not recommended, as the transition temperature becomes too close to the temperature at which the mixture softens sufficiently to mold suppositories. In temperate climates hardening agents may be satisfactory, but for the extemporaneous dispensing of suppositories in the tropics they are useless. (3) With proper manipulation and correct control of temperature, using a thermometer, suppositories can be made in tropical countries with cocoa butter provided they do not contain medicaments which lower the melting point to such an extent that they remain soft at room temperature. (4) It is recommended that the monographs of the B. P. and B. P. C. be modified, as they are of no assistance in the present form to dispensers in the warmer parts of the British Empire. (5) The statement that the base should melt at 37° means very little unless the method of taking the melting point is given. It is recommended that a base should be just pourable at temperatures not above 40°. (6) Hydrogenated palm kernel oil having the physical and chemical characters indicated is suitable for use as a suppository base in warm climates. In cases where the base is too soft owing to a high temperature or where the melting point is lowered by soluble medicaments it may be hardened by the addition of hydrogenated soya bean oil, melting point 56°, or beeswax. For general use in Malaya in sup-

positories containing no soluble medicament the addition of 5% of hardened soya bean oil is satisfactory, but if fat-soluble substances are present the amount of hardening agent must be increased. (7) There is little change to a metastable state when the palm kernel oil is heated to temperatures well above the softening point and the lowering of the melting point due to this change is too small to be of any practical significance. (8) The cost of hardened palm kernel oil compares favorably with that of cocoa butter.—A. F. CALDWELL. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 680–688. (S. W. G.)

PHARMACEUTICAL HISTORY

Drug Laboratory in the Bureau of Chemistry, United States Department of Agriculture—Establishment of. The author, former Chief of the Drug Laboratory has related the story of "the founding of the laboratory, some of its early work, some of the prior activities of Congress and the lack of action on the part of Government officials in the field of pure and safe drugs" The report must be read in its entirety in order to get an adequate picture of what has transpired.—LYMAN F. KEBLER. *Jour. A. Ph. A.*, 29 (1940), 379. (Z. M. C.)

Pasteur and Bacteriology. An address.—R. DE SMEDT. *Fermentatio*, (1939), 169–173; through *Chem. Abstr.*, 33 (1939), 8235. (F. J. S.)

Pharmacy in Great Britain—Progress of. This historical review discusses the subject under the following divisions: the apothecary—1180 to 1606; the Society of Apothecaries—1617 to 1841; the Pharmaceutical Society of Great Britain—1841 to date. The centenary of the Pharmaceutical Society will be celebrated next year.—LESLIE G. MATTHEWS. *Jour. A. Ph., A.*, 29 (1940), 418. (Z. M. C.)

Quinine—Historical Notes on. The history of the discovery of the properties of quinine is very vague. It seems to have been first encountered in Malacatos a city of the Province of Loxa in Peru, and later also found in Bolivia and Colombia. An Indian, Segundo Jussieu, tormented by thirst and fever drank water from a lake in which grew roots of the plant and was cured. Other legends credit another Indian with curing a Spaniard by use of the powdered bark. Humboldt who lived in the country for a while, maintained that the Indians knew nothing of the medicinal value of any of these plants. Credit for definite knowledge of the therapeutic value of quinine is usually given to the Governor of Loxa who in 1640 sent some of the powdered bark to Lima to cure the intermittent fever of the Countess of Chinchon, wife of the Viceroy. (We know now that it was the Count who suffered and was cured by his wife.) He, returning to Spain, carried it with him, and the older name Peruvian Bark was changed to Countess' Powder or quinine powder. The Jesuits in Lima observing its curative properties sent some to Cardinal Lugo in Rome, and there the drug was called Jesuit's Powder and Cardinal's Powder. Sydenham was the first to introduce it in England. The English physician, Tabor, treated Louis XIV with a wine of quinine curing him of malaria. Analysis of the drug was attempted in the late 18th century, lapsed, then revived in 1880–1882. Various bitter principles were extracted and salts were prepared. Vauquelin, Gomez, Pelletier and Caventon are names associated with these researches. Controversies have raged over the value or toxic properties of its alkaloids. There are about 40 varieties of quinine.—DURVAL TORRES. *Gazeta Pharm.*, 8 (1939), 19. (G. S. G.)

PHARMACEUTICAL LEGISLATION

Drug Addiction in India—Problem of. In an editorial, the writer discusses the drug addiction problem in India from an ethical, and economic and a detrimental standpoint. The origin of drug addiction and some useful preventitive and curative measures are also included in the discussion.—ANON. *Indian Med. Gaz.*, 75 (1940), 355–356. (W. T. S.)

Drugs Act, 1940. A review.—J. C. GHOSH. *Indian and Eastern Chemist*, 21 (1940), 101. (A. C. DeD.)

Glucose—Control of. The Minister of Food has published two Orders establishing control over the manufacture, import and sale of glucose. The Glucose (Control) Order, 1940 (S. R. and O. 848), which came into force on June 3, prohibits, except under license of the Minister of Food, the manufacture, import or sale, by wholesale of glucose in the United Kingdom. From June 1, supplies of glucose will be allocated to manufacturers at the existing rates for the allocation of sugar, where these apply. Proportionate reductions are being made in other cases. The Glucose (Provisional Prices) Order, 1940 (S. R. and O. 849), which also came into force on June 3, prohibits, except under license of the Minister of Food, the sale of glucose at a price exceeding the average price of similar descriptions, varieties and quantities of glucose during the past four weeks.—ANON. *Chemist and Druggist*, 132 (1940), 411. (A. C. DeD.)

Indian Chemical Manufacturers' Association and the Drugs Act (India), 1940. The Committee of the Indian Chemical Manufacturers' Association have issued the statement regarding the Drugs Bill as reported on by the Select Committee.—ANON. *Indian and Eastern Chemist*, 21 (1940), 102. (A. C. DeD.)

War Export Tax for Dutch East Indies. The government of the Dutch East Indies has introduced a bill imposing a war export duty of 5% on oil, oil products, quinine, rubber and tin. The duty will be additional to the existing export duty on these commodities.—ANON. *Chemist and Druggist*, 133 (1940), 95. (A. C. DeD.)

PHARMACEUTICAL ECONOMICS

Brazil Carnauba Wax Exports. During the first nine months of 1939, Brazil exported 7151 metric tons of carnauba wax, compared with 6542 metric tons during the corresponding period of the previous year.—ANON. *Chemist and Druggist*, 132 (1940), 405. (A. C. DeD.)

Canadian Citric Acid Imports. During 1939 Canada imported 1,288,746 lb. of citric acid, valued at $299,002, compared with 900,094 lb., valued at $213,207 in the previous year.—ANON. *Chemist and Druggist*, 133 (1940), 95. (A. C. DeD.)

Carnauba Wax Imports—U. S. A. During 1939 the United States imported 16,358,500 pounds of carnauba wax as compared with 13,915,700 pounds in 1938 and 12,377,000 in 1937.—ANON. *Chemist and Druggist*, 132 (1940), 454. (A. C. DeD.)

Chemical Prices. Price trends of a number of important industrial chemicals from 1900 to 1940 are charted.—F. J. VAN ANTWERPEN. *Ind. Eng. Chem.*, 32 (1940), 1444–1445. (E. G. V.)

Dollars and Sense of Safety. Accidents in chemical and related industries and the economics of safety are discussed.—F. J. VAN ANTWERPEN. *Ind. Eng. Chem.*, 32 (1940), 1437–1443. (E. G. V.)

Fluorine and the Manufacturing Chemist. The patent literature of the last few years shows that much research is being directed toward the utilization of organic fluorine compounds.—ANON. *Indian and Eastern Chemist*, 21 (1940), 99. (A. C. DeD.)

Is Chemical Industry Ready? A series of articles on pharmaceutical manufacture, camphor, nylon, equipment, etc., relative to America's problem of

defense.—*Ind. Eng. Chem.*, 32 (1940), 1151–1180. (E. G. V.)

Japanese Drug and Chemical Exports. In 1939 Japan exported drugs, chemicals and allied products to the value of 108,000,000 yen, compared with 74,000,000 yen in 1938.—ANON. *Chemist and Druggist*, 132 (1940), 454. (A. C. DeD.)

Newfoundland Cod Liver Oil Exports. The quantity of cod liver oil exported from Newfoundland during the year ending June 1939 was 163,286 gallons, valued at $107,586 compared with 101,685 gallons, valued at $59,732 in the previous year.—ANON. *Chemist and Druggist*, 132 (1940), 405. (A. C. DeD.)

Peru—Imports into. In 1939 Peru imported pharmaceutical and chemical products to the value of 20,460,000 soles, compared with 16,046,000 soles in the previous year.—ANON. *Chemist and Druggist*, 132 (1940), 454. (A. C. DeD.)

MISCELLANEOUS

Aliphatic Soap and Cosmetic Compounds. As example, petrolatum melting at 42–44° C. is treated with chlorine at 80° C. When 23.3% chlorine is absorbed, the chlorinated mixture is oxidized in air in the presence of 0.2% potassium permanganate at a temperature of 110–113° C.—French pat. 842,261; through *Am. Perfumer*, 41 (1940), No. 4, 79. (G. W. F.)

Ambergris. A discussion.—J. CHARIER. *Soap, Perfumes and Cosmetics*, 13 (1940), 376; through *Am. Perfumer*, 41 (1940), No. 4, 73. (G. W. F.)

Bath Preparations. Bath preparations may be classified into five groups: (1) water-softeners, (2) medicaments, (3) perfumes, (4) soaps and (5) materials for cleaning the bath after use. Each of these groups is discussed.—ANON. *Chemist and Druggist*, 133 (1940), 91. (A. C. DeD.)

Bath Salts. The qualities to be sought in bath salts are water softening ability, ready solubility in water, stability of structure, reasonable cost and mild action on the skin. Types and components are discussed.—ANON. *Drug and Cosmetic Ind.*, 47 (1940), 145–146. (H. M. B.)

Catgut Thread—Penetration of Hot Alcohol Into. The following conclusions are given: (1) There is no difference in the penetration of hot alcohol into defatted and non-defatted catgut threads. (2) The penetration is effected by concentric layers going from the periphery of the thread to its center. (3) The penetration is increased by heat. (4) The minimum time required for 90% alcohol at 60° to penetrate is 12 hours for No. 3 and No. 6 catgut and 16 hours for No. 10 catgut. (5) Similar results are obtained when the heating is continuous or intermittent. (6) Absolute alcohol does not penetrate catgut thread as rapidly as less concentrated alcohol.—M. RUDERMAN. *Bull. sci. pharmacol.*, 46 (1939), 461–471. (S. W. G.)

Citrus Fruit Juices—Preparation of. Citrus fruit juices come to the market in various forms as (*a*) cordials, (*b*) squashes, (*c*) pure fruit juices, with or without fruit cells, (*d*) juices for special purposes, such as concentrates. The proportion of fruit juice in these beverages varies somewhat according to brand, but may be regarded usually as forming from about a third to a half of the whole. Both cordials and squashes are also prepared in an aerated or carbonated form. Early in the development of the citrus fruit juice industry all citrus juices were rendered clear, but the trend to-day, except with lime, is toward a cloudy or pulpy juice. During recent years much work has been done, particularly in the United States, in devising methods of preserving citrus juices in their natural state, without the addition of preservatives or other materials. The juices of different citrus fruits vary in keeping properties, and methods of manufacture vary somewhat accordingly.—ANON. *Bull. Imp. Inst.*, Vol. 37, No. 3; through *Chemist and Druggist*, 132 (1940), 188. (A. C. DeD.)

Cosmetic Compositions. In dentifrices, cosmetic compositions, such as shampoos, etc., use is made of a lyophilic higher molecular weight aliphatic acid ester of an aliphatic polyhydroxyl compound with an aliphatic polycarboxylic acid, *e. g.*, the ethanolamine salt of the monotartaric acid ester of monolaurin.—BENJAMIN R. HARRIS. U. S. pat. 2,192,907, March 12, 1940. (A. P.-C.)

Cosmetic Literature—Critique of. First of a series of articles criticizing various published cosmetic works. Subjects discussed are the use of alkalies in vanishing creams, computing alkalies for saponification, talcum powder, depilatories and deodorants. A criticism of various ambiguities existing in cosmetic writings. The p_H value of perspiration, value of *o/w* and *w/o* emulsions and skin absorption of different emulsions are reviewed.—F. ATKINS. *Soap, Perfumes and Cosmetics*, 13, (1940) 168; 314; through *Am. Perfumer*, 41 (1940), No. 4, 75. (G. W. F.)

Cosmetics and Insecticides—Stable Emulsions of Materials Such as. A stable emulsion is formed of water, a liquid immiscible with water, such as an oil and activated gelatinous alumina which is prepared by boiling in water a precipitate of gelatinous alumina and aging it. Numerous examples are given.—THURSTAN W. DICKSON. U. S. pat. 2,194,-218, March 19, 1940. (A. P.-C.)

Danish Apothecaries Society Control Laboratory (D. A. K.) Preparations. The Danish Apothecaries Society Control Laboratory has issued monographs for the following simples, composites and reagents: Acetsulfapyridine, Ethylallynal (Ethylallylbarbituric Acid = Dormin), Amphetamine Sulfate, Apronal (Allylisopropylacetylcarbamide = Sedormid), Sodium Benzoate, Stilbestrol, Sulfapyridine, Oxedrine Drops, Aneurin (Thiamine) Solution for Injection, Strong Aneurin Solution for Injection, Alkaline Tablets with Belladonna, Amphetamine Tablets, Aneurin Tablets, Apropal Tablets, Calcyl Tablets (Acetylsalicylic Acid and Calcium Carbonate), Stilbestrol Tablets, Strong Stilbestrol Tablets, Aneurin Drops, Calciferol, Solution of Calciferol in Oil, Granules of Calciferol, Calciferol Troches, Benzoyl Chloride, Digitonin, 3,5-Dinitrobenzoyl Chloride, Potassium Iodide-Starch Paper, Sodium Fluoride, Pyridine, Reinecke's Salt, Zircon Nitrate, Standard Sodium Fluoride Solution, Sodium Alizarin Sulfonate, Zircon Nitrate-Sodium Alizarin Sulfonate Indicator Solution, 0.1 Molar Potassium Aluminum Sulfate solution, 0.1 Molar Sodium Nitrite Solution.—ANON. *Arch. Pharm. Chemi*, 47 (1940), 454. (C. S. L.)

Dental Plate Cleaner. One part of citric acid and 5 parts isopropyl alcohol in water are suggested for removing mucin plaque accumulations on dentures.—U. S. pat. 2,201,098; through *Am. Perfumer*, 41 (1940), No. 4, 81. (G. W. F.)

Dentifrice. Magnesium pyrophosphate is used as a base in the dentifrice.—U. S. pat. 2,211,373; through *Am. Perfumer*, 41 (1940), No. 4, 81. (G. W. F.)

Depilatory. A solution is used containing a soluble stannite, such as that of sodium or potassium, and having a p_H of less than 12.6 and containing also a stabilizer having at least three alcoholic hydroxyl groups, such as triethanolamine.—WM. B. STODDARD and JULIUS BERLIN. U. S. pat. 2,199,249, April 30, 1940. (A. P.-C.)

Depilatory. Rosin is used with at least half its quantity of a nondrying oil such as a mineral oil and with a small proportion (suitably about 4%) of a wax such as beeswax.—Martha E. Buff. U. S. pat. 2,202,829, June 4, 1940. (A. P.-C.)

Emulsifiers and Detergents. Sulfonated alkyl hydroxyaromatic compounds, produced by the halogenation of petroleum distillate to form alkyl halides, conversion of the aromatic hydroxy compound to a mixture of alkyl hydroxy aromatic compounds with sulfonation of the resulting mixture of compounds.—U. S. pat. 2,196,985; through *Am. Perfumer,* 41 (1940), No. 4, 77. (G. W. F.)

Fingernail Enamel. Cellulose nitrate is used with a plasticizer such as a phthalate ester mixture and a polymerized aliphatic or alicyclic acrylic acid ester such as polymerized propyl methacrylate.—RICHARD C. PETER, assignor to E. I. DU PONT DE NEMOURS & Co. U. S. pat. 2,195,971, April 2, 1940. (A. P.-C.)

Fungicide. The essential active ingredient is 2,4-diaminodiphenylamine.—U. S. pat. 2,203,431; through *Am. Perfumer,* 41 (1940), No. 4, 83. (G. W. F.)

Insecticidal Compositions. *2,166,119*—In preparing insecticides such as fly sprays also containing kerosene, use is made of the monisobutylamide of 10-undecylenic acid (an oily compound that melts at 24° to 25° C. and boils at 158° to 160° C. under a pressure of 2 mm.) or other amide of the general formula $R'CON(R'')CH_2CH(CH_3)_2$ in which R′ is an aliphatic hydrocarbon radical having from 7 to 11 carbon atoms and R″ is hydrogen or an aliphatic hydrocarbon radical. *2,166,120*—This relates to solutions prepared from pyrethrum in a solvent such as kerosene and also containing isobutylundecylenamide or other amide of the general formula R′C(:X)NR″R‴, where X is oxygen or sulfur, R′ is hydrogen or a hydrocarbon radical and R″ and R‴ are hydrogen or a hydrocarbon residue, and where one R is aliphatic and has at least 6 carbon atoms.—EUCLID W. BOUSQUET, assignor to E. I. DU PONT DE NEMOURS & CO. U. S. pats. 2,166,119 and 2,166,120, July 18, 1939. (A. P.-C.)

Insecticidal Sprays. About 100 gallons of water are used with about 0.5 to 4 lb. of a fat acid ester such as a fish oil or a fat acid soap and an oil having a viscosity from slightly under that of kerosene to about 95 Saybolt (the fat acid content totaling from about 5% to 30% of the oil), such material having a free acid content of 0.5% to 20%, and with an effective proportion of a substantially water-insoluble, finely divided solid insecticide such as calcium arsenate in suspension.—CLARENCE D. DOLMAN, assignor to HERCULES GLUE CO. U. S. pat. 2,195,696, April 2, 1940. (A. P.-C.)

Insecticidal Sprays. With a solvent such as kerosene, naphtha or carbon tetrachloride, use is made of a β-hydroxyethyl ether of 2,4-diethylphenol or 4-*sec*-butylphenol (suitably with a plant extract containing pyrethrin or rotenone).—GERALD H. COLEMAN and JOHN W. ZEMBA, assignors to DOW CHEMICAL CO. U. S. pat. 2,194,924, March 26, 1940. (A. P.-C.)

Insecticides. A dry insecticidal composition which is readily dispersible in water to form a stable dispersion comprises an organic insecticide of the rotenone and pyrethrum class and a water-soluble salt of a hydroxy-substituted aromatic sulfonic acid which is soluble in acetone, such as sodium butylated phenyl phenol sulfonate, is produced by dissolving a mixture of the insecticide and dispersing agent in acetone and evaporating the solution to dryness.—GEO. L. HOCKENYOS, assignor to MONSANTO CHEMICAL CO. U. S. pat. 2,197,500, April 16, 1940. (A. P.-C.)

Insecticides. A powdered insecticide (such as derris, cubé or barbasco root) which normally loses its toxic effect when exposed to the sun's rays is coated with a white pigment such as titanium dioxide in sufficient quantity to inhibit such action of light.—DALTON B. FALOON, assignor to HAMMOND PAINT AND CHEMICAL CO. U. S. pat. 2,168,064, Aug. 1, 1939. (A. P.-C.)

Insecticides. *2,172,689*—An insecticidal concentrate suitable for preparing sprays for use on foliage comprises a fixed oil such as corn oil together with a contact insecticide such as a pyrethrum extract and a volatile liquid such as turpentine in which the contact insecticide is soluble and which is itself soluble in the oil, and emulsifying agent such as "mulphur A" which is soluble in the concentrate. *2,172,690*—This is generally similar to the previous patent, except that a mineral oil is used instead of a fixed oil.—WALTER C. O'KANE, assignor to SPRAY BASE CORP. U. S. pats. 2,172,689 and 2,172,690, Sept. 12, 1939. (A. P.-C.)

Insecticides. 9-Chlorofluorene is used in dusting powders or sprays.—HOUSTON V. CLABORN and LLOYD E. SMITH, assignors to THE PEOPLE OF THE U. S. A. FOR FREE USE. U. S. pat. 2,175,109, Oct. 3, 1939. (A. P.-C.)

Insecticides. Insecticidal powders or sprays are prepared containing *N*-ethyl-*N*-benzylcyclohexylamine or other compound of the general formula $XCH_2N(Z)Y$, in which X represent phenyl or an alkyl- or halo-substituted phenyl radical, Y represents cyclohexyl or an alkyl- or halo-substituted cyclohexyl radical and Z represents an alkyl, chloroalkyl or alkylol radical.—HENRY L. MORRILL, assignor to MONSANTO CHEMICAL CO. U. S. pat. 2,192,927, March 12, 1940. (A. P.-C.)

Insecticides. *2,166,121*—Walnut shell flour of smaller particle size than 100 screen mesh is used as a carrier for 2,4-dinitro-6-cyclohexylphenol or other compounds in which the cyclohexyl group is displaced by a hydrocarbon group containing at least three carbon atoms from the class consisting of the alkyl and cycloalkyl radicals. *2,166,122*—This discloses insecticides of a similar character to those of the preceding patent, except that redwood flour of like particle size is used as the carrier.—ALFRED M. BOYCE dedicated to THE GOVERNMENT AND THE PEOPLE OF THE U. S. A. U. S. pats. 2,166,121 and 2,166,122, July 18, 1939. (A. P.-C.)

Medicinal Preparation. Refined fish oils such as cod liver oil or other vitaminic oils, are stabilized by the addition of a small proportion of a vegetable phosphatidic material of which the fatty acid radicals of the phosphatides therein have no more than 2 double bonds, such as phosphatidic material derived from corn oil or cottonseed oil.—BENJAMIN H. THURMAN, assignor to REFINING, INC. U. S. pat. 2,201,062, May 14, 1940. (A. P.-C.)

Plaster of Paris Bandages. An open-mesh fabric sized with a mixture of water softenable stiffening material such as dextrin and a substantially noncolloidal, water-insoluble filter material such as china clay (the mixture used being substantially chemically inert to water) is used with a coating of plaster of Paris.—RAYMOND E. REED, assignor to KENDALL CO. U. S. pat. 2,195,342, March 26, 1940. (A. P.-C.)

Shaving Soap—Liquid. The addition of superfatting fillers, such as lanolin, petrolatum, montan wax, protects the skin. Trigamine is preferred to triethanolamine.—P. I. SMITH. *Am. Perfumer,* 41 (1940), No. 2, 55–56. (G. W. F.)

Silk Sutures. A substantially noncapillary nonwater-absorptive suture comprises a silk strand coated with a composition containing ethylcellulose, and is capable of maintaining its noncapillarity at

no substantial loss after being heat-sterilized in mineral oil.—THEODORE F. BRADLEY, assignor to AMERICAN CYANAMID CO. U. S. pat. 2,193,188, March 12, 1940. (A. P.-C.)

Soap and Its Effect on the Skin—Relation Between Composition of. Pure sodium alkyl sulfates are less irritant to human skin than the pure sodium or potassium salts of the saturated fatty acids from C-8 to C-18. Sodium lauryl sulfate is the most frequent cause of skin irritation of the series studied, but it is closely followed by myristyl sulfate. Sodium chloride and sodium sulfate enhance the irritant action of these soap substitutes markedly. This enhancement is greater with sodium carbonate. —ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 259. (A. C. DeD.)

Soap Maker—Notes for the. A series of practical contributions on the processes of soap making and perfuming.—ANON. *Indian and Eastern Chemist*, 21 (1940), 105. (A. C. DeD.)

Soap Perfuming. A discussion of the uses of some primary, secondary and tertiary alcohols in perfuming soap.—T. RUEMELE. *Deut. Parfüm.-Ztg.*, 25 (1939), 141; through *Am. Perfumer*, 41 (1940), No. 4, 73. (G. W. F.)

Soap Stabilization. Thiourea derivatives not only stabilize soap against rancidity but also prevent discolorization.—R. L. SIBLEY. *Soap*, 16 (1940), No. 2, 21; through *Am. Perfumer*, 41 (1940), No. 1, 77. (G. W. F.)

Soap Substitutes. Products resembling soap are made from sodium silicate, sodium bicarbonate and plasticizing agent such as magnesium hydroxide. Other soap substitutes are made from mixtures of gum mucilage, saponin, sodium silicate, rosin and ammonia.—W. MEYER. *Fette u. Seifen*, 47 (1940), 23; through *Am. Perfumer*, 41 (1940), No. 4, 81. (G. W. F.)

Soap—Use of Nigre in. Nigre (the lower layer containing weak solution of soap, alkali, salt and impurities) may be used as follows: (1) boiling of a fresh soap over an old nigre yielding a darker soap; (2) incorporation of nigre into a soap of lower grade; (3) purification of nigre; and (4) using dark nigres in dark colored soaps.—J. M. VALLANCE. *Am. Perfumer*, 41 (1940), No. 3, 57–60. (G. W. F.)

Sorbitol Syrup in Cosmetics. Sorbitol syrup is recommended as a substitute for glycerin as it has the following advantages: non-irritating, less hygroscopic, less liable to lose water, reduces the greasy feel of creams, aids in production of finer-particle emulsions, adds more body, increases adherence of powder and rouge, antioxidant, is a domestic product, and its price is more stable. Formulation necessitates no change other than decreasing the water content by the amount of sorbitol used. It is recommended for creams of various types, tooth paste, etc.—M. G. DENAVARRE. *Am. Perfumer*, 41 (1940), No. 3, 33–35. (G. W. F.)

Tampons—Porous Products for. A porous product is prepared by swelling animal material such as skin or sinew containing elastin or collagenous fibers in a swelling medium such as a dilute acid solution and distributing a gas such as air, nitrogen or hydrogen throughout the material, subjecting it to the action of a shrinking agent such as ammonia, and removing surplus water from the product and working it into a desired shape.—WILHELM SCHULTE, assignor to N. V. KONINKLIJKE PHARMACEUTISCHE FABRIEKEN V/H BROCADES-STHEEMAN & PHARMACIA. U. S. pat. 2,202,566, May 28, 1940. (A. P.-C.)

Tooth Powder. A dentifrice in the form of small, discrete, hollow bodies or beads of a generally globular or spherical shape contains a major proportion of an extremely finely divided polishing agent such as calcium carbonate or dicalcium phosphate together with a detergent such as a soap, etc., and other conventional dentifrice ingredients, the discrete bodies or beads being all retained on a 200-mesh screen and substantially all passing a 40-mesh screen, being free flowing and disintegrating on contact with an aqueous medium.—ALBERT L. SCHULERUD, assignor to COLGATE-PALMOLIVE-PEET CO. U. S. pat. 2,196,154, April 2, 1940. (A. P.-C.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Acetanilid and Related Compounds—Changes in Blood Pigments Associated with the Prolonged Administration of Large Doses of. Large doses of acetanilid (135 and 540 mgs. per Kg.) administered daily by mouth to monkeys produced moderate amounts of methemaglobin and sulfhemoglobin, associated with an appreciable fall in total hemoglobin. The administration of 50 mgs. of acetanilid per Kg. for periods lasting longer than three months produced no appreciable changes in either methemaglobin, sulfhemoglobin or total henoglobin. The authors concluded that judging from the general conditions of the animals that they could survive this dose indefinitely. Chronic studies are also reported for rats. In the rat, phenacetine was ranked with acetanilid as a methemaglobin and sulfhemaglobin producer.—PAUL K. SMITH. *J. Pharmacol.*, 70 (1940), 171. (H. B. H.)

Adrenaline and Amphetamine—Metabolic and Cardiovascular Effects of Intramuscular Injections of. Intramuscular injections of adrenaline in normal fasting men either did not change, or slightly increased, the proportion of carbohydrate utilized during the period in which blood sugar and lactate were elevated. Acetone bodies in blood and urine fluctuated within the normal range. Amphetamine did not modify carbohydrate utilization or the concentrations of sugar, lactate or acetone bodies in the blood. It had a calorigenic effect that was smaller in magnitude but more sustained than that of adrenaline. The rise in systolic blood pressure after amphetamine was greater in one subject, and in all subjects was more sustained than after adrenaline. In contrast with adrenaline, amphetamine produced a small but consistent rise in diastolic pressure.—D. B. DILL, R. E. JOHNSON and C. DALY. *Am. J. Med. Sci.*, 198 (1939), 702–712. (B. H.)

Adrenaline and Respiration. Further analysis of the improvement by 0.1 mg. adrenaline, of the respiration of the rabbit and the cat, reported in a previous paper, showed, that in the cat, in the majority of cases the improvement still existed after the vasosensible zones were ruled out and that in the rabbits the improvement appeared, after intracysternal administration; also when the intermediary changes of the blood pressure could be excluded. The improvement therefore, in the author's opinion, originates, at least partially, by central stimulation.—B. S. POLAK. *Arch. intern. pharmacodynamie*, 64 (1940), 52. (W. H. H.)

Adrenaline—Observations on the in Vitro Synthesis of, under Physiological Conditions. Experiments have been carried out in which solutions of various substrates related to tyrosine were submitted to the action of surviving tissue slices of the bullock adrenal medulla under physiological conditions and then assayed colorimetrically for adrenaline. Of these compounds phenylethylamine was the most active, being converted in amounts up to nearly 40% into an adrenaline-like substance (*i. e.*, responding to the Vulpian reaction) while tyramine and phenyl-

alanine were about one-quarter as active. The results with tyrosine, methyltyrosine and hordenine were negative, as also with dopa and methyldopa (determined physiologically). A marked response was also given by the unidentified catechol compound present in adrenal extracts. This effect is limited to medulla tissue and is not obtained with cortex. Autolysis of cortex or medulla tissue over a period of many hours does not give rise to adrenaline. The result is not affected by the presence of tyramine. These results are discussed, particularly in relation to the claim of Schuler and Wiedemann (1935) that tyramine is the precursor of adrenaline in the guinea pig adrenal.—J. DEVINE. *Biochem. J.*, 34 (1940), 21. (F. J. S.)

Adrenova. Adrenova is a double tartrate of adrenaline and ephedrine. It has the same action and equivalent pharmacodynamic effect. It oxidizes slowly and therefore can be administered through absorption by the buccal mucosa, which facilitates slow and continuous medication in the ambulant patient.—E. A. MAISTO. *Semana méd.*, (1939), 1460; through *An. Farm. Bioq. (Sup.)*, 10 (1939), 78. (G. S. G.)

17-Allyltestosterone and Its Transformation Products. Allyltestosterone, allylandrostenediol and 4 derivatives of 17-allyltestosterone (triene ketone, tetraoxyketone and two epimeric trioxyketones) showed no sex hormone activity in 5×0.1 mg. doses in the Fussgänger cock's combe test, and in 4×0.1 mg. doses in the Allen-Doisy test on the castrated mouse.—A. BUTENANDT and D. PETERS. *Ber. deut. chem. Ges.*, 71 (1938), 2688–2695; through *Chimie & Industrie*, 42 (1939), 679. (A. P.-C.)

Amines—New and Improved Methods for the Preparation of Pharmacologically Important. A study and synthesis of a few dihydro- and tetrahydrobenzo-isoquinolines. These compounds act as strong poisons toward protozoa, the tetrahydrogenated derivatives (1-phenyl-1,2,3,4-tetrahydro-6,7-benzoisoquinoline and 1-phenyl-1,2,3,4-tetrahydro-5,6-benzo-isoquinoline) being particularly active in this respect.—K. KINDLER, W. PESCHKE and G. PLUDDEMANN. *Arch. pharm.*, 277 (1939), 25–32; through *Chimie & Industrie*, 42 (1939), 682. (A. P.-C.)

Androgen Activity—New Test of. The author reports that by using the fish *Lebistes reticulatus* as the test animal a rapid determination of the male hormone content is possible. The following procedure is recommended: Into each of nine glass aquariums place 100 cc. of water containing diminishing quantities of the product to be tested. In a tenth aquarium place only water. The liquids should be maintained at about 26° and should be supplied with air by bubbling it in through a tube. Place ten *Lebistes*, less than one day old, in each vessel and examine the occupants of each vessel daily. Determine the last vessel in which, toward the fourth day, all the animals show the appearance of gonopodes. The strength, in male hormone, of the amount of sample placed in the water in this vessel corresponds to at least 0.125 mg. of testosterone propionate or to about 6 International Units. The sample may consist of organs, powders or extracts, and if the substance is insoluble in water it may be emulsified by agitation.—M. T. REGNIER. *J. pharm. chim.*, 1 (1940), 147–155. (S. W. G.)

Anesthetics—Influence of General, upon Adrenergic Transmission. The following summary is given: (1) Experiments have been made on the effects of a dozen general anesthetics on the actions of adrenaline and sympathetic stimulation on perfused rabbit's ears, isolated frog's hearts and the nictating membrane and blood pressure of spinal cats. (2) In concentrations somewhat lower than the estimated anesthetic concentrations, they all, except chloralose, diminish the effect of adrenaline. The effect of nervous stimulation is also diminished, though usually less than that of adrenaline, but once seriously diminished under the influence of stronger solutions, its recovery is slower. Chloralose increases the action of adrenaline on the perfused rabbit's ear vessels, and the nictating membrane of spinal cats, but diminishes the effect of sympathetic stimulation. Sixty-two references are given. —C. S. JANG. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 661–676. (S. W. G.)

Antianemic Power of the Liver—Biological Control of. The author gives the results obtained in rabbits by the method of Lourau, de Sacy and Arthus and states that this method may be used advantageously as a biological control of the activity of hepatic extracts.—M. T. CAPSONI. *Biochim. terap. sper.*, 26 (1939), 448. (A. C. DeD.)

Antihemorrhagic Activity of Simple Compounds. It is found that, in the chick at least, 2-methylnaphthoquinone possesses antihemorrhagic activity of the same order of magnitude as the vitamin K_1. Hitherto no simple compounds corresponding in chemical structure to the chemically identified vitamins exhibited the same order of activity as the vitamins themselves. The ethyl- and propyl-derivatives were much less active than the methyl homolog.—M. TISHLER and W. L. SAMPSON. *J. Am. Chem. Soc.*, 61 (1939), 2563. (E. B. S.)

Arsenicals—Existence of Relation between Physiological Properties and Certain Physical Characteristics of. The authors have obtained and studied the "difference of potential-intensity" curves for various trivalent arsenical compounds. They find that each given sample has its own curve but that it bears no relation to the physiological properties of the compound. The variations in conductivity observed among different samples of the same compound are probably caused by the varying amounts of mineral salts present and tolerated by the Codex. Therefore the establishment of "difference of potential-intensity" curves and the determination of the optical density do not permit the determination of the strength of organic arsenical preparations and cannot be substituted for the biological assays of these preparations.—G. ANTOINE and M. T. REGNIER. *J. pharm. chim.*, 1 (1940), 201–213. (S. W. G.)

Bee Venom. The active factor in venom is a salt-like combination of two components. One is a weak dialyzable acid with a high phosphorous content to which are due the convulsion-producing properties of the venom. The other component is also dialyzable, is weakly basic, gives protein reactions and is only slightly soluble in water. In water, hydrolysis takes place as follows: Component 1 (weak acid) + component 2 (weak base) $\rightleftharpoons$ native venom (salt). Slightly acid solutions favor the formation of native venom.—G. HAHN. *Oesterr. Chem.-Ztg.*, 42 (1939), 57–64; through *Chimie & Industrie*, 42 (1939), 670. (A. P.-C.)

Benzedrine Sulfate after Avertin. Benzedrine sulfate, 10 mg., was given to children after avertin anesthesia. The only immediate effect was the return of the superficial reflexes. There was a definite reduction in the duration of the postoperative sleep as compared to the control cases. Most of the patients vomited profusely after the benzedrine sulfate.—J. BOYD. *Brit. Med. J.*, 4139 (1940), 729. (W. H. H.)