PHARMACEUTICAL ABSTRACTS

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ABSTRACTORS

CONTENTS

Fixed Oils, Fats and Waxes

Dihydroxypropyl Esters of Fatty Acids—Preparation of, and Use in Emulsions and Ointments Containing Water. The various modern offerings of emulsifying agents are considered, especially the group consisting of an ester of a polyvalent alcohol, either ethylene glycol or glycerol, with various fatty acids. A trade preparation "Tegin" (Goldschmidt, Essen) is taken as a prototype. Analysis shows this to be 4.38% sodium stearate, 10.11% stearic acid, 76.45% stearic esters of glycerol and 9.06% water and free glycerol (by difference). The stearic esters are a mixture of about equal parts of mono- and distearins. The content of sodium stearate determines that the emulsion will be of the type oil-in-water. A series of such esters has been prepared in the Control Laboratory of the Danish Apothecaries Society. Thus, hydroxyethylstearate may be made either from ethylenechlorhydrin and potassium stearate or from ethylene glycol and stearic acid. Synthesis by the latter method is described in detail. In the same way an hydroxyethyl oleate can be made. The glycerol ester, *dihydroxypropyl stearate* or "monostearin," can be made in pure form by several methods described in the literature but for the purpose desired the inexpensive method of direct reaction of the alcohol and fatty acid gives a satisfactory mixture of mono-, di- and tristearates, chiefly, however, the monostearates under the conditions described. *Preparation.*—500 Gm. stearic acid and 400 Gm. glycerol (both of high purity) were mixed in a large flask and gradually brought, with boiling off of the water content of the glycerol, to 250° and held there one-half hour. The whole operation takes about 2 hours. After cooling to 100°, the mixture was poured into a dish, then cooled to a cake, separated from excess glycerol, washed and dried. The melting point was the same as that of "Tegin," 57° C. It did not, however, contain the sodium stearate of the "Tegin" formula. If made from cheaper commercial stearins, the odor was unpleasant. The preparation was soluble, one part in less than 10 parts of chloroform, in 40–50 parts ether, in about 100 parts benzol, in about 1000 parts petrol ether and in over 1000 parts alcohol. It was practically insoluble in water. In the same way a mono-olein preparation was made from pure oleic acid and a mono-laurin from *Acidum Cocos*, Ph. Dan. (the fatty acids of cocoanut oil). Preparations from fatty acids of castor oil or of linseed oil are also suggested. An example of the use of the monostearin in a cosmetic ointment is cited. To form some sodium stearate, to each 100 Gm. of the melted monostearin, 15 cc. of $N/1$ sodium hydroxide are added before the remainder of the cosmetic formula is mixed in. The colloid chemical theory of the influence of the emulsifying agent on the charge of oil droplets is discussed. The monostearin is not useful if acids or heavy metal salts are to be added to the ointment. In these cases amine salts of fatty acids are better emulsifying agents, for example, the diethylethylenediamine salt of oleic acid, $C_{16}H_{33}CONHCH_2CH_2N(C_2H_5)_2$, ("Sapamine," Ciba). The phosphate, lactate or acetate of this amine is sometimes used as an emulsifying agent. The water-in-oil creams, such as lanolin, cetyl alcohol-vaseline ointments, etc., are also discussed. Here cholesterol or cetyl alcohol usually serves as the emulsifying agent. Mono-olein or monolaurin can be used for this type of preparation. The use of mono-glycerides in other types of emulsion preparations, such as liniments, is also discussed.—E. V. CHRISTENSEN. *Arch. Pharm. og Chem.*, 42 (1935), 172, 197. (C. S. L.)

Hawthorn Fruit—Oil of. No chemical studies of the fruit of the hawthorn have been reported in the literature. The characteristics of the fruit according to Grafe are given. The fruits were reduced to a coarse powder in a ball mill after drying as completely as possible at 98° in a drying chamber. Table I gives the results of an investigation of the kernels in terms of both the original and the dried fruits. The presence of about 48% crude fibre accounts for the difficulty experienced in powdering the material. The fruits are used chiefly (in Switzerland) in the preparation of hawthorn tea, while in other places they are used as a substitute for coffee. The tea made from the kernels is recommended for almost all possible sicknesses. A tea was prepared in the proportion of 60 Gm. to 1 L. water, filtered, studied and the results tabulated. Lastly, the oil extracted from the dried and powdered fruits with ether was completely investigated as to physical constants and some qualitative tests for the presence of various constituents such as phytosterol, etc. The oil was of an orange-brown color, most of the color being due to unsaponifiable material.—J. PRITZGER and R. JUNGKUNZ. *Pharm. Acta Helv.*, 10 (1935), 75.

(M. F. W. D.)

Palm Oils—Composition of Commercial. IV. Progressive Hydrogenation as an Aid in the Study of Glyceride Structure. During hydrogenation, the mixed palmito-C_{18}-glycerides frequently become completely hydrogenated in preference to the tri-C_{18}-glycerides, and, to a less

marked extent, dipalmito-oleins are often hydrogenated preferentially to monopalmito-dioleins. By comparing the fatty acid components of the fully saturated and mixed saturated-unsaturated glycerides in a series of fats obtained by hydrogenation of a natural fat to various stages, it is possible to ascertain which of the classes of glycerides have passed into the completely hydrogenated state at different stages of hydrogenation and to select stages at which all dipalmito- and some monopalmito-glycerides (but no tri-C_{18}-glycerides) have become fully hydrogenated. At these points the remaining mixed saturated-unsaturated glycerides then include only monopalmito-di-C_{18}- and tri-C_{18}-glycerides, and a further estimation of the tri-C_{18}-glyceride content of the original fat becomes possible. The respective percentage compositions of a Cape Palmas oil and a Belgian Congo oil follow: myristic acid 1.6, 1.3; palmitic acid 32.3, 41.4; stearic acid 5.5, 4.7; oleic acid 52.4, 42.9; linoleic 8.2, 9.7.—A. BANKS, H. K. DEAN and T. P. HILDITCH. *J. Soc. Chem. Ind.*, 54 (1935), 77T. (E. G. V.)

Rose Mallow Seed—Oil of. Analysis of Rose Mallow seed gave 20.23% of an ether-soluble oil resembling cotton and okra seed oils and consisting of glycerides of oleic acid (33.12%), linolic acid (45.53%), palmitic, stearic and arachidic acids (15.60%) and unsaponifiable material (1.34%).—CHARLES BARKENBUS and SARAH T. THORN. *J. Am. Chem. Soc.*, 57 (1935), 728. (E. B. S.)

Shark Liver Oil. Liver oils from five species of shark have been examined. Estimation of vitamin A was made colorimetrically by the antimony trichloride method using a biologically assayed cod liver oil for comparison. Free fatty oil and unsaponifiable matter were determined. Commercial samples were very poor in taste and color and with one exception inferior to cod liver oil in vitamin A. Since unsatisfactory conditions might be due to rendering methods, fresh livers were carefully rendered and tested. Two were considerably more potent in vitamin A; they were only one-tenth as strong in vitamin D. They were all free from bad odor and taste. All deposited stearine at room temperature.—W. S. JONES and W. G. CHRISTIANSEN. *J. Am. Pharm. Assoc.*, 24 (1935), 295. (Z. M. C.)

Glycosides, Ferments and Carbohydrates

Proteolytic Enzyme—Content of, in Latex from the Fig Tree (Ficus Carica L.). There is a marked seasonal variation in the amount of enzyme present per unit volume of sap and the concentration is lowest in early summer.—BENJAMIN H. ROBBINS. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 892. (A. E. M.)

Protrolytic Enzyme in the Latex from the Fig Tree (Ficus Glabrata). p_H of Optimal Activity. The optimum hydrogen-ion concentration for the ficin-gelatin proteolysis is p_H 5.—BENJAMIN H. ROBBINS. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 894. (A. E. M.)

Strophanthus Hispidus—Constituents of. The author states that the family Apocynacæ is especially rich in plants containing as their active constituent glucosides having the therapeutic properties of heart tonics. To this family belong the many varieties of strophanthus which contain a heart-stimulant glucoside located in the seeds as well as in the bark of the plant. Fraser, Feist, Heffter, Sachs and especially Jacobs and co-workers undertook many investigations on strophanthus seed. *Strophanthus kombe, hispidus* and *s. emini*, all contain the constituent strophanthidin $C_{23}H_{32}O_6$. Besides strophanthidin it contains another glucoside periplogenin having the formula $C_{23}H_{34}O_5$. Arnoud isolated ouabain $C_{29}H_{44}O_{12}$ from *Strophanthus gratus*. One of the products of the hydrolysis of ouabain, that is, ouabagenin $C_{23}H_{43}O_8$, he was unable to isolate. The reason for this is that ouabain does not hydrolyze in acid solution like strophanthidin, but the "genin" is rather destroyed by hydrolysis. Jacobs and Bigelow isolated from ouabain with the use of a special method, a crystalline "genin," which contained one carbon atom less (C_{22}) than the original ouabagenin (C_{23}). This carbon atom separated out during the splitting up of the compound. In *Strophanthus sarmentosus*, Jacobs and Heidelberger have isolated sarmentocymarin, $C_{30}H_{46}O_9$, and then through hydrolysis they obtained sarmentogenin $C_{23}H_{34}O_5$. Because of close resemblance of all strophanthus seed, positive identification of their constituents is very difficult. A sample labeled *Strophanthus hispidus* was examined and through hydrolysis other "genins" were obtained in place of strophanthidin. The reason for this is not known. It was not possible to crystallize out the glucoside at first so that an acid was added to the crude mixture. Two "genins" were thus isolated; A. $C_{23}H_{32}O_4$ and B. $C_{23}H_{30}O_6$ which belonged to the same group of plant "genins" as strophanthidin, periplogenins, etc. Likewise they contained 23 carbon atoms

and gave a positive test with sodium nitroprussate and alkalies. The "genin" A, ($C_{23}H_{32}O_4$) has two hydroxyl groups which can be easily acetylated. In the molecule there is a double bond which can be hydrated by the removal of an (OH) group. The original "genin" would have had the formula $C_{23}H_{34}O_5$ which is an isomer if not identical with sarmentogenin which also has two hydroxyl groups. The "genin" B has the formula $C_{23}H_{30}O_6$ and is also unsaturated; three molecules of water were taken up during hydration. The original "genin" has the formula $C_{23}H_{34}O_8$ which is isomeric with ouabagenin. The relation to sarmentogenin and ouabagenin is not well established but can be indicated as monoanhydro-hispidogenin A, and dianhydrohispidogenin B.—R. TSCHESCHE. *Ber.*, 68 (1935), 423. (G. B.)

Tea—Classification of Leaves and Stems of. The tea found on the market is composed of buds, leaves, stems and young branches (twigs) of the tea shrub, *Thea chinensis*. On analysis all these constituents have the same composition, outside of the stems and young branches (twigs) which contain from 1.8–2.6% less "thein" and produces a tea infusion of lesser aromatic flavor.—I. CUCULESCU. *Bul. Fac. Stiinte Cernauti*, 7, 28–30 *Cernauti Instit. der nuiw.;* through *Chem. Zentr.*, 106 (1935), 973. (G. B.)

Thevetin. Cardiac Glucoside of Be-Still Nut. The article consists of a description of the cardiac glucoside recently discovered by K. K. Chen. The substance was obtained from the Be-still nut or *Thevetia neriifolia*, indigenous to South America but now cultivated in the East Indies, India, the Hawaiian Islands and Western Africa.—*Chem. and Drug.*, 122 (1935), 456. (T. G. W.)

Other Plant Principles

Drosera Rotundifolia—Constituents of. A hydroxymethylnaphthaquinone, ($C_{12}H_8O_3$), m. p., 69–70°, and a second substance, m. p., 225°, were isolated from a steam distillate of the drug. From an ether extract of the dried residue remaining after steam distillation, there was obtained a brown, crystalline, quinone-like substance in a yield of 0.001%. The compound $C_{11}H_8O_3$ was shown to be present also in *Drosera binata*.—H. DIETERLE. *Arch. Pharm.*, 273 (1935), 235. (L. L. M.)

Lupulin—Value of Fresh. The active constituents of lupulin, which consist of an ethereal oil extract, were examined, using the barium-method of Fromme. These constituents were acid in nature. This examination proved further, that the highest percentages of ethereal soluble extract were obtained from the fresh drug; these constituents were named "crude lupulin." These constituents of ethereal oil are little prone to decomposition when obtained from fresh drug. The determination of the ether-insoluble extract, gives no clue as to the freshness of the drug. In contrast to this a high content of "crude lupulin" indicates that the drug is fresh. Should this (content) be of a soft consistency, this would indicate presence of resins and oleoresin.—A. TOMINGAS. *Pharmacia*, 14 (1934), 223–237, Tarta. Univ; through *Chem. Zentr.*, 106 (1935), 930. (G. B.)

Marshmallow Root—Acidity of, and Presence of Calcium Soluble in Acetic Acid. Samples of freshly collected root and extracts prepared before and after drying at 100° were acid to litmus paper. Commercial samples also gave acid reactions with litmus paper. The fresh root was washed, peeled and decorticated. A mucilage was prepared in the cold using water acidified with acetic acid. The mucilage was filtered, the filtrate treated with ammonium oxalate, the precipitate was filtered, washed and calcined. The residue was taken up in diluted hydrochloric acid, the solution neutralized with ammonium hydroxide and treated with ammonium oxalate in acetic acid medium. Calcium oxalate crystals formed. Samples of decorticated root yielded the following ashes: 3.95, 4.35, 4.05, 3.9 and 3.95%.—P. DUMONT and A. DE CLERCK. *J. pharm. Belg.*, 17 (1935), 305–307. (S. W. G.)

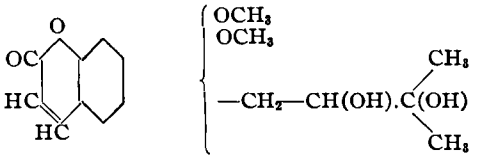
Monarda Fistulosa—Sterols from. Phytochemical Notes. No. 111. Unsaponifiable material from the saponified fatty oil from the leaves of wild bergamot was imperfectly crystalline. Upon purification and recrystallization good crystals were obtained. The sterol was acetylated and crystallized and the absence of stigmasterol was indicated. Testing of larger amounts may show presence of stigmasterol with a sitosterol.—OLE GISVOLD. *J. Am. Pharm. Assoc.*, 24 (1935), 214. (Z. M. C.)

Nânâcatl. Delirium Fungus (Amanita Mexicana). The active constituents of the fungus occur chiefly in the skin of the cap and are separated or the poisonous principles are destroyed by scalding with hot water in order that all of the properties are not completely lost and also made

unobjectionable to enjoy as a food. Experiments show that the fungus contains at least 4 toxic principles and corresponding to these arise poisoning or intoxication cases with wholly different pathological pictures: (1) the atropine-like alkaloids affect the psychic exaltation with the feeling of pretended strength and a desire to show this property. All secretions are strongly increased, pulse weak and easily repressed, (2) symptoms due to muscarine, and (3) the substances causing the real intoxication with its characteristic hypersensibility, with delirium of hours duration and finally stupor is unknown in our pharmacology as another of the fly-killing fungi. An historical account, the toxicology and the nature of the intoxication are discussed fully.—V. A. REKO. *Pharm. Monatsh.*, 16 (1934), 29–31. (H. M. B.)

Pinus Sabiniana—Sterol from. Phytochemical Notes. No. 113. After saponification of the fatty oil from the seed of the Digger's pine, the nonsaponifiable material yielded a sterol. After purification the sterol crystals melted at 137.5° and the acetate at 127.5°. The digitonide obtained from the mother liquid was decomposed with boiling xylene, the resulting sterol and its acetate having the melting points stated above. This sterol therefore appears to be a sitosterol.—OLE GISVOLD. *J. Am. Pharm. Assoc.*, 24 (1935), 290. (Z. M. C.)

Toddalolactone. Chemical Investigation of Toddalia Aculeata (Pers.). Part 2. A Zeisel determination indicated two methoxyl groups in the molecule of toddalolactone ($C_{16}H_{20}O_6$). Carboxyl and phenolic groups are absent. Two hydroxyl groups are present, one secondary, the other tertiary in character. With phthalic anhydride, the lactone gave a crystalline monophthalate (m. p., 180–181°). The hydroxyl groups occur on adjacent carbon atoms since the lactone, by loss of a molecule of water, gave a crystalline ketone, $C_{16}H_{18}O_5$, which was characterized by its phenylhydrazone and semicarbazone. The presence of a lactone ring is shown by the fact that treatment with diluted sodium hydroxide in the hot afforded an acid, $C_{16}H_{22}O_7$, melting at 178–179°, $[\alpha]_D^{30}$ in methanol = +36.1°. The structural features of toddalolactone are depicted as here shown:

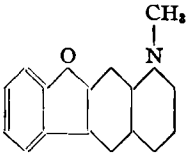


The positions occupied by the groups in the benzene ring are still undetermined.—B. B. DEV and P. P. PILLAY. *Arch. Pharm.*, 273 (1935), 223. (L. L. M.)

Unclassified

Anesthetics—Some Colored Local. Ten colored compounds were made by diazotizing procaine and coupling with various dye intermediates. Those in which the diazotized procaine was coupled with methyl anthranilate, *p*-bromoaniline, α-naphthylamine, α-naphthylamine + α-naphthylamine, methyl anthranilate + α-naphthylamine and diazotized *p*-nitroaniline + procaine showed anesthetic properties. The compounds formed by coupling with hydrochloric acid, salicylic acid, resorcinol and methyl salicylate did not show anesthetic properties.—J. H. GARDNER and L. JOSEPH. *J. Am. Chem. Soc.*, 57 (1935), 901. (E. B. S.)

Benzofuroquinolines. This article describes the preparation of certain derivatives of dibenzofuran with the hope of obtaining compounds which will exert in some degree morphine-like effects. By application of Skraup's method to 3-aminodibenzofuran, two isomeric "quinolines" were obtained. These were hydrogenated to the py-tetrahydro derivatives and the secondary



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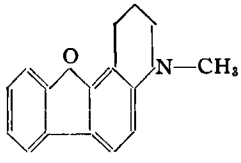


II

bases thus obtained were converted into the *N*-methyl derivatives I and II. Physiological activity increased from the quinolines through the tetrahydro compounds, reaching a maximum for the methyl derivatives. II was slightly more active than I.—E. MOSETTIG and R. A. ROBINSON. *J. Am. Chem. Soc.*, 57 (1935), 902. (E. B. S.)

Charcoal—Adsorption, Prepared from Crude Cellulose. The majority of commercial charcoal showed from 2–93 times less adsorption activity than *Carbo Medicinalis* or *Carbo Adsorbens* from the modern pharmacopœias. Through simple carbonization of cotton (raw absorbent cotton), peat moss and other similar products, are often obtained more active products than the commercial charcoals. Factors to be taken into consideration in the power of adsorption of charcoals are: rapid carbonization of the loose structure (material); raw material gives better results, than a slow charring of a compact, solid structure which permits little air to go through. The best charcoal was obtained through simple ignition of cotton in a crucible; its adsorption power for methylene-blue was only 7 times less than *Carbo Medicinalis*. Renewed ignition in smaller crucibles increased from 2–12 times its former activity.—ST. BADZYNOKI. *Wiadomosci farinac.*, 61 (1934), 385–388; through *Chem. Zentr.*, 106 (1935), 927. (G. B.)

Citric Acid. The manufacture of citric acid is carried on in two steps, namely, the production of calcium nitrate and the conversion of the calcium citrate into citric acid. The calcium citrate is either prepared from lemons or by the fermentation of sugar. Each case involves the oxidation of sugars to citric acid. By the use of the fermentation method, pure cane sugar is used. It is minutely regulated as to its precise nutritive value and oxidized by a pure strain of a cultivated mold.—*Chem. and Drug.*, 122 (1935), 435. (T. G. W.)

β-Cyclopentyl and β-Cyclohexyl Glucosides—Biochemical Synthesis of. The synthesis of β-cyclopentyl glucoside in cyclopentanone is formed from adipic acid, and the product is reduced to cyclopentanol. The cyclopentanol is dissolved in alcohol and water, and then saturated with glucose. After standing for 12 hours, 1.5 Gm. of emulsin (prepared by precipitating casein with acetic acid, adding $^1/_4$ of its volume of 95% alcohol, clarifying with kieselguhr, and reprecipitating the emulsin with four times its volume of 95% alcohol) is added and the mixture is stirred continually, at room temperature. At the end of two days, polarimetric observations are made until the rotation does not change. One gram of emulsin is then added to insure complete reaction, and the mixture is then permitted to stand again until the rotation is constant. The solution is filtered, and then distilled completely in a vacuum. The residue is dissolved in boiling ethyl acetate, and the rotation is levorotatory. To further purify, the solution is evaporated to dryness, and the residue is dissolved in water. The aqueous solution is exhausted with ether, and the last traces of glucose are destroyed by yeast. The solution is distilled in a vacuum, and the residue dissolved in ethyl acetate. The resulting solution of β-cyclopentyl glucoside does not reduce Fehling's solution. A description of the physical and chemical properties of this compound is included. *Synthesis of β-Cyclohexyl Glucoside.*—This synthesis is effected by saponification of the tetraacetyl derivative of β-acetobromoglucose. The cyclohexanol is mixed with water and acetone. Glucose is added, and the mixture agitated during 12 hours. The mixture is then filtered and 1 Gm. of emulsin is added. The angle of rotation is observed as before, and a modified extraction of the above compound is given, as well as the physical constants.—J. VINTILESCO and C. N. IONESCO. *J. pharm. chim.*, 21 (1935), 241. (M. M. Z.)

Dyes—Medicinal. An address before the New York Branch of AMERICAN PHARMACEUTICAL ASSOCIATION was restricted to six dyes. The speaker's introductory remarks dealt with the antagonism shown by certain physicians to retail pharmacists. The apparent explanation was a feeling that the pharmacist was "allowing his interests to become so diversified in the field of commercial retailing" that he did not act for the best interest of his physician clients and they felt his information on technical subjects was getting exceedingly thin. The speaker discussed the question of defining dyes, it being nearly impossible to find a definition that is universally applicable. A medicinal dye is one that has been found by practical experience to be of use in the treatment of disease—they are not found by theorizing. One of the first artificial dyes was trinitrophenol prepared in 1771. Commercial development was very rapid between 1890 and 1911. By 1914, Germany was far to the front but since the war, dye manufactures in other countries have excelled. The war brought on great interest in medicinal dyes and antiseptics. In the world dye situation at present there are four important competing groups. Methylene Blue, one of the oldest and most interesting dyes, has had much publicity over its use as an antidote for poisoning

by cyanide, illuminating gas, carbon monoxide. There are better antidotes for cyanide; nitrites and sodium thiosulphate as well as sodium tetrathionate apparently are better. It is not likely to be useful in carbon monoxide poisoning because it apparently forms methemoglobin. Its surgical uses are in wounds, injuries or diseases of sinuses, mouth, pharynx, gums. Other uses are less well developed. Crystal Violet, hydrochloride of hexamethyl-pararosaniline, appears to be especially effective against gram-positive bacteria: staphylococci, the diphtheria bacillus. Neutral Acriflavine is the most toxic of the dyes in common use. Its widest use is for acute, subacute and chronic urethral gonorrhea. Scarlet Red Sulphonate is a complex sodium salt related to beta-naphthol. Like Scarlet Red Medicinal Biebrick it stimulates growth of epithelial tissues. Brilliant Green has much the same indications as Crystal Violet but is a less efficient bacteriostat and more stimulating to wounds. A rather new use for it is in so-called "barber's itch." Medicinal Fuchsine is said to be a mixture of rosaniline and pararosaniline hydrochlorides. The medicinal dye is not that used for staining. Athlete's foot, trichophytosis and similar infections are treated with a preparation containing medicinal Fuchsine. A new use of Fuchsine is for burns. Once Carron Oil was largely used; more recently the tannic acid treatment has had considerable use because of the theory that a burn protein produces the toxicity. This theory may not be completely tenable. Some investigators felt that the abstraction of tissue fluid was the principal underlying cause of the serious effects. Logical outgrowth of this theory was the introduction of large amounts of fluid and this treatment is routine in good hospitals, but this theory is probably not based upon the principal factor. A third theory recently proposed is that intoxication following severe burns is the direct result of infection. Treatment has been designed to eliminate infection. Originally a vaporizing spray of 1 per cent solution of Gentian Violet was used; later Crystal Violet was used; now it is thought a mixture of Crystal Violet, Acriflavine and Brilliant Green or Fuchsine may be best. Dyes are contraindicated about the eye. Dyes in excess of 0.5 Gm. should not be injected in solutions into closed cavities. They should not be used in dirty, crushed wounds until the wounds have been surgically cleaned up. Patients who have been taking large amounts of dyes internally should not be subjected to direct sunlight where it is intense.—DAVID A. BRYCE. *J. Am. Pharm. Assoc.*, 24 (1935), 241. (Z. M. C.)

Ethyl Ether, U. S. P.—Stability of. It was found that U. S. P. ether, as supplied at the present time in large metal containers in this country, does not deteriorate rapidly when the container is opened. Using the Nessler reagent for aldehyde determination and potassium iodide for peroxides, results indicated no deterioration products as long as 68 days after the first opening of the large drums of U. S. P. ether. In clinical investigation, the anesthetist was found unable to distinguish the effects of drum ether in small cans labeled "for anesthesia" by the reaction of surgical patients (702), when ignorant of the source of the ether used. The authors conclude that there is no difference between the anesthetic effects of drum or anesthetic ether.—H. GOLD and D. GOLD. *Anesthesia and Analgesia*, 14 (1935), 92; through *Squibb Abstract Bull.*, 8 (1935), A-505.

Gelatin—Use of, in Medicine. Gelatin possesses properties which are more adapt to intravenous usage than is acacia. Acacia appears to have a viscosity equal to that of the blood and an osmotic pressure equal to that of the colloids in the blood under normal conditions. However, it is simply a mechanical agent rather than one activating body tissues. Gelatin not only possesses the properties of a gum, but also those of a nutrient, hemostatic and stimulant to antibody formation. It is also an animal tissue, with elements of an incomplete protein. The fear that sterilization of gelatin (140° C.) produces an ineffective preparation has been shown to be partially in error, because even though the product is less effective than the unsterilized preparation (possessing a possibility of tetanus spores) an increase in dosage is all that is necessary to obtain the desired results. Gelatin is a valuable adjunct to infant feeding and in adult dietaries. It is of particular importance in preparing special foods for invalids and convalescents. Only absolutely sterile gelatin should be used for medical purposes. Solutions for topical application range from 5 to 12 per cent; for subcutaneous or intramuscular injection not over 6 per cent; for intravenous use not over 2 per cent. Gelatin solutions may be used with dextrose, calcium gluconate or sodium chloride, or all may be used in combination, in hemorrhage. Gelatin is a reliable antibody stimulant.—W. F. DUTTON. *Clin. Med. and Surg.*, 42 (1935), 165. (W. H. H.)

Glycerol—Mixed Esters of, with Aliphatic Acids and Phosphoric Acid. An ester derived from 1 molecule of glycerol and 2 molecules of an aliphatic acid is treated at about atmospheric

temperature with phosphorous oxychloride in the presence of an acid-binding agent, *e. g.*, pyridine, and the product is poured into ice water to produce an acid ester of glycerol with phosphoric acid and the aliphatic acid. Examples are given of the manufacture of products from diolein, distearolin, dicrotonin and dilaurin. The products and their salts are of therapeutic value.—F. HOFFMANN-LA ROCHE and Co. Ger. Pat. 608,074, Jan. 15, 1935 (Cl. 12*o*. 5.04). (S. W. G.)

Hexamethylenetetramine—Production of Medicinal, from Technical Product. The purification of technical hexamethylenetetramine is accomplished by using a solution of 95% alcohol mixed with charcoal and this is finally dissolved in water. For laboratory details see original article. The total yield was from 75–76% U. S. P. product and only 10–12% of the total yield was technical. The total loss during the process was only 12–15%. The quantity of alcohol recovered during the experiment was from 70–75%.—M. WOLPE. *Ssowjet. Pharmaz.*, 5 Nr. 3 (1934), 33–34, Wiss-prakt.-pharmaz. Inst. d. Leningrad. Health Clinic; through *Chem. Zentr.*, 106 (1935), 926. (G. B.)

Lac—Constitution of. The composition of lac varies within certain limits depending among other things on the host plant, brood, climatic conditions and the method of collection. Lac itself, however much purified, is never a chemical entity. Stick lac, that is the resinous incrustation as removed from the twigs, contains dead insect bodies, the lac dye and wax, as well as the true resin constituents. The lac resin consists of hydroxy acids of the aromatic and aliphatic series; two of these acids, alemitic and shellolic have been isolated and identified.—R. BHATTACHARYA. *J. Soc. Chem. Ind.*, 54 (1935), 82T. (E. G. V.)

Perfumes—Synthesis of. Preparation of Methylene Ester of Pyrocatechol. A study of the preparation of the methylene ester of pyrocatechol by the action of dichloromethane (instead of di-iodomethane as generally used) on an alkaline salt of pyrocatechol. A mixture of 3 Gm. pyrocatechol, 2.4 Gm. dichloromethane, 1.6 Gm. caustic soda, 0.7 Gm. of water and 9 Gm. ethanol are heated for 15 to 18 hours on the water-bath, yielding a dark liquid containing sodium chloride crystals. The liquid was steam distilled, the distillate extracted with ether, the extract washed with caustic soda solution and with water and then dried, and the ether was evaporated. The amount of caustic soda used should be about 72% of that theoretically required to combine with the pyrocatechol; the best medium is 96% ethanol and the optimum temperature is 110° to 115° C. The maximum yield obtained was 23.2% of theoretical.—R. L. BACHRACH. *Maslo-boino Zhirovoe Delo*, 9 (1934), 42; through *Chimie & Industrie*, 33 (1935), 137. (A. P.-C.)

Trisodium Periodate and Periodic Acid—Preparation of. Fifty grams of sodium iodate, 660 cc. of soda lye (density, 1.332) and distilled water to make up to 2000 cc. are introduced into a pyrex-graduated container. The mixture is heated to 80°, stirred, and 80 cc. of pure bromine is introduced. The product is filtered, washed several times with 200-cc. portions of water and then dried. A crystalline compound of trisodium periodate (97–99% pure) is obtained. The periodic acid is prepared by first dissolving a weighed amount of trisodium periodate in excess normal nitric acid. In another container, an equivalent amount of silver nitrate is dissolved in water, and then the two solutions are mixed. The resulting periodate of silver is washed, placed in a container with water warmed to 70°, and bromine is added until a light yellow precipitate results, upon agitation. The precipitate is separated, and washed. The washings and mother liquor are combined, and evaporated partly with concentrated sulphuric acid, and finally pieces of soda are added. The periodate is removed and appears as a light yellow solid.—J. LANGE and R. PARIS. *J. pharm. chim.*, 21 (1935), 403. (M. M. Z.)

BIOCHEMISTRY

Anterior Pituitary—Studies on the Thyrotropic Hormone of. Changes in metabolic rate of a group of rats injected with large doses of a purified extract of thyrotropic hormone were followed. A rise in metabolic rate occurred during the first week of injections reaching a peak of plus 28 per cent; the metabolism then dropped to the preinjection value by the second or third week and continued to fall going as low as minus 29 per cent by the fifth week. The microscopic appearance of the thyroid at this stage of treatment resembled that of the untreated hypophysectomized animal. The pituitary gland of the animals injected with thyrotropic hormone for a long period of time gave a negative response when tested for the presence of thyrotropic hormone although they still contained the growth hormone. In studying the nature of this apparent resistance to the thyrotropic hormone, it was found that the serum of animals which had been injected for a long period of

time with thyrotropic hormone contained a substance that is capable of inhibiting the action of thyrotropic hormone. The serum from these rats when given in doses of 0.5 to 1.0 cc. twice daily for three days to hypophysectomized rats, prevented a rise in metabolic rate with amounts of thyrotropic hormone equal to 200 times the minimum effective dose. A similar finding was obtained when normal rats and guinea pigs were used as the test animals. The injection of thyrotropic hormone to a horse for a period of four months was found to produce the antithyrotropic substance in the horse's serum after the first month. Extracts of the antithyrotropic serum of the horse were prepared which, when given in doses of 0.4 cc., were capable of inhibiting the action of 100 units of thyrotropic hormone in the normal rat. Larger amounts of the extract, up to 4 cc. daily, not only inhibited the action of 100 units of thyrotropic hormone injected into normal rats but at the same time apparently inhibited the thyrotropic hormone of the animal's own pituitary gland, causing a fall in metabolic rate to minus 24 per cent, which is the metabolic rate of the hypophysectomized animal. The antithyrotropic substance appeared to be unstable and boiling at p_H 5 for 3 minutes completely destroyed the inhibitory substance. The extract was also found to lose a considerable degree of its potency when kept in sterile ampuls in a refrigerator for two months. When kept at room temperature, the potency was entirely lost after this time. The discovery of this inhibitory substance is believed by the authors to provide the explanation for the numerous negative reports on the clinical use of the thyrotropic hormone. The nature or mechanism of action is discussed.—J. B. COLLIP and E. M. ANDERSON. *J. Am. Med. Assoc.*, 104 (1935), 965. (M. R. T.)

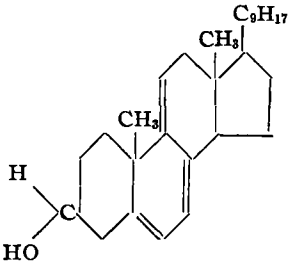
Cow's Milk—Antirachitic. Comparative Study of Antirachitic Value of Irradiated Cow's Milk and of Milk Produced by Cows Fed Irradiated Yeast. Thirteen rachitic infants, after a preliminary treatment-free observation period during which the activity of the rachitic process was established, were divided into groups that were fed 720 cc. or 480 cc. daily doses of cow's milk made antirachitic either by irradiation or by feeding irradiated yeast to cows. The infants were housed in hospital wards or rooms. Roentgenograms were taken weekly and determinations of the calcium, inorganic phosphate and phosphatase levels in the blood serum were made usually every two weeks and only occasionally at intervals of 1 or 3 weeks. On the basis of the data collected in this study, it is concluded that there is for rachitic infants no practical difference in antirachitic efficacy between cow's milk made antirachitic on the one hand by irradiation and on the other by feeding cows irradiated yeast, when the same amount of the antirachitic factor is administered, as represented by an identical number of Steenbock rat units per day. The antirachitic factor in both milks in an amount assayed to equal 40 Steenbock rat units per day was able to produce satisfactory healing in the blood in from 49 to 61.7 days and in the bone in from 10.5 to 11 weeks. The antirachitic factor in the yeast milk in an amount assayed to equal 27.5 Steenbock rat units per day also was able to bring about satisfactory healing in the blood and in the bone. However, the period of time required to bring about this result in the blood was on an average 118 days (from 74 to 155 days) and in the bones on an average 21.2 weeks (from 16 to 24 weeks), indicating, therefore, that for the rachitic infants tested in this study the dose of 27.5 Steenbock rat units per day was very close to the actual minimum amount required for the ultimate healing of the active rickets.—H. J. GERSTENBERGER, *et al.* *J. Am. Med. Assoc.*, 104 (1935), 816 (M. R. T.)

Ascorbic Acid—Total, Content of Human Blood. Method of Determination. Mix 5 cc. of oxalated blood with 5 cc. of 10% trichloracetic acid, shake and add 5 cc. 16.6% mercuric acetate. After 5 minutes add 0.25 Gm. calcium carbonate and centrifuge. Treat thoroughly with hydrogen sulphide. After 18 hours, remove the hydrogen sulphide with a stream of nitrogen. Use for titration a solution of 2.6 sodium dichlorphenolindophenol (25 mg. in 50 cc.) so diluted that 12 cc. is equivalent to 1 mg. of ascorbic acid as determined by a standard. Add 1 cc. 10% acetic acid to 5 cc. of the hydrogen sulphide-free filtrate and titrate into 0.1 cc. of the indicator solution. The values in normal individuals are between 1.19 and 2.66 mg. %.—I. ARTHUR MIRSKY, S. SWADESH and S. SOSKIN. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1130. (A. E. M.)

Dietetics—Some Aspects of. Acidosis, diabetes, constipation and infant feeding are dealt with briefly in this article.—*Pharm. J.*, 134 (1935), 259. (W. B. B.)

Ergosterol. By studying the peroxides of ergosterol and dehydroergosterol, obtained by the action of oxygen in the presence of light and a sensitizer, as well as their transposition products

it has been ascertained that dehydroergosterol has two double bonds in the same position as in ergosterol:



M. MULLER. *Z. physiol. Chem.*, 231 (1935), 75; through *Squibb Abstract Bull.*, 8 (1935), A-362.

Etrones—Separation of, from Urine. Isolation of α-Folliculin from Urine of the Horse. The α-folliculin obtained from the urine of the horse m. 262° (corrected); [α] 190 in chloroform = +158.4°. The hormone is identical with the international standard of folliculin and that from pregnant women. The benzoate m. 217.5° and on resolidification m. 204–205°. The color reactions described by Schwenk and Hildebrant, *S. A. B.*, 6 (1933), 445, for β-folliculin were also obtained with α-folliculin and the international standard. Both the latter in doses of 0.3γ in oil solution produced estrus in 8 of 15 rats.—V. DEULOFEU and J. FERRARI. *Compt. rend. soc. biol.*, 118 (1935), 588; through *Squibb Abstract Bull.*, 8 (1935), A-464.

Ovarian Follicular Hormone—Crystalline. The hormone obtained from hog ovaries seems to be identical with dihydro-theelin. The *m*-brombenzoate has a melting point of 154–155°, as compared with 155–156° found with the analogous compound prepared from pure dihydro-theelin. The hormones obtained by saponification of the latter compounds have an identical melting point of 170–171°.—D. W. MACCORQUODALE, SIDNEY A. THAYER and EDWARD A. DOISY. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1182. (A. E. M.)

Gastric Secretions. The latest biological theory concerning the gastric secretions is that histamine, or a salt of it, is formed in the wall of the stomach and causes an outpouring of secretion. It is probable that histamine is derived from food in contact with the stomach lining. The same result would follow from a persistent salt-free diet. The present craze of tablet taking is to be discouraged. If a tablet of an anhydrous chemical lay in contact with the moisture-laden tissue of the stomach, it exerts a severe hygroscopic effect. Powders are to be preferred over tablets, but neither should be taken on an empty stomach. The use of sodium bicarbonate in dyspepsia is popular, but fallacious. It is useful, not in acidity, but when the acid is already low, for it dissolves the mucous and stimulates secretion. Magnesium hydroxide and bismuth carbonate given a fair time after food are effective in reducing acidity. Acids should also be given a fair time after foods.—B. R. BRAMWELL. *Pharm. J.*, 134 (1935), 268. (W. B. B.)

Gonadotropic Hormones. A. Szarka (*Orvosi Hetilap*, Nov. 1934, page 1009) using Evan's technique, established that by augmenting the anterior pituitary hormone with a hormone prepared from amnion a still greater gonadotropic activity was secured. With a modified technique a combination was finally established (0.45 anterior pituitary lobe; 0.5 placenta; 0.05 part hemolyzed "pregnant blood") which appears to have properties greatly resembling those of the pituitary hormone yet surpassing this in luteinizing activity, and differing somewhat from the urinary hormone.—*Brit. Med. J.*, 3873 (1935), 54. (W. H. H.)

Hormones. Endocrinology. A survey of the present knowledge of endocrinology is presented. This covers the hormones of the thymus, pituitary, thyroid, pancreas, parathyroid and adrenals and the sex hormones, their source, action and clinical use.—R. DENISON. *Pennsylvania M. J.*, 38 (1935), 313; through *Squibb Abstract Bull.*, 8 (1935), A-402.

Hormones and Lipoids—Separation of. Substances containing complex albumin-lipoid-hormone compounds, *e. g.*, glands, gland extracts, blood and aqueous fruit extracts, are treated with an organic solvent capable of decomposing the complex compounds, *e. g.*, alcohol or acetone, and also with an adsorbent, *e. g.*, active aluminum oxide, active carbon or silica gel, whereby the albumin is precipitated, the lipoid is adsorbed and the hormone remains in solution. Further concentration of the lipoid and the hormone can then be effected in known manner. Special

processes are described.—G. PERITZ and C. BRAHM. Ger. Pat., 608,414, Jan. 23, 1935 (Cl. 12*p*. 17.10). (S. W. G.)

Insulin—Purification of. Method for Precipitation of. A 0.2% aqueous solution of potassium ferrocyanide precipitated insulin quantitatively from acid solution since filtrates from such precipitates were entirely inactive and the precipitates contained all the activity as determined by biological tests. Also, the filtrates treated with picric acid gave inactive precipitates which doubtless represented impurities. This occurred even with insulin containing 20 international units per mg. The potassium ferrocyanide-insulin precipitate (Ferrinsulin) (I) when prepared from the purest commercial insulins was light blue in the dry condition, but a deeper blue when prepared from more impure commercial preparations. Thus the blue color was due to impurities. I was insoluble in water and dilute hydrochloric acid but soluble in 2% sodium phosphate or ammonium phosphate. This reaction afforded not only a means of purifying insulin but of determining *in vitro* the purity of a given preparation. For example, a sample equivalent to 100 units of an insulin supposed to contain 20–22 international units per mg. should give approximately 5 mg. of I. The amount of potassium ferrocyanide needed to precipitate 100 units was less than 1 cc., but excess of the 0.2% reagent had no effect on precipitation. However, with more concentrated solutions of reagent (10%), excess dissolved some of the precipitated I.—I. I. NITZESCU and S. SECAREANU. *Bull. soc. chim. biol.*, 17 (1935), 118; through *Squibb Abstract Bull.*, 8 (1935), A-403.

Lecithins—Use of, in Nutrition, Etc. This review covers the chemistry of lecithins as well as their use in foods, etc. Twenty-two papers most of which have been published since 1930 are quoted from at considerable length. Analytical data is presented mostly in tabular form. The compilation of information is both concisely and logically presented.—E. I. VAN ITALLIE. *Pharm. Weekblad*, 72 (1935), 238–246, 296–304. (E. H. W.)

Liver—Effect of Autolysis on Potency of, in Treatment of Pernicious Anemia. Case evidence is submitted which shows that both experimental and commercial autolysates of liver have less hematopoietic activity against pernicious anemia than amounts of liver from which they were derived. This was contrary to the observations of Herron and McEllroy reported in 1932 which suggested that autolysis markedly increased the potency of liver in the treatment of pernicious anemia.—W. B. CASTLE and M. B. STRAUSS. *J. Am. Med. Assoc.*, 104 (1935), 798. (M. R. T.)

Liver Extract—Charcoal Adsorption as a Method for the Preparation of Concentrated. A method for the preparation of liver extract based on the property of the hematopoietically active principle of becoming adsorbed by charcoal from an acid solution is described. This allows the concentration of the fluid to a small volume without much loss of potency.—JEAN L. KYER. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1102. (A. E. M.)

Liver Extract—Preparation of. The authors give a rather complete history of the use of liver extract. Analyses show the major constituents of liver to be somewhat as follows: water 72.0%, protein (N. × 6.25) 20.4%, fat 4.5%, carbohydrate 1.7%, ash 1.4%. None of these constituents, as such, is of interest in the manufacture of liver extract, but the finer constituents not indicated in such an analysis contain the active material. Colin and his collaborators proved that the active principle was water soluble, and could be freed from liver protein by precipitation at the isoelectric point. By extracting the residue with ether they then separated all lipoid substances, and finally separated an alcohol-precipitable fraction. By treatment with basic lead acetate, all carbohydrates were eliminated, and still the active principle remained in the filtrate. The active principle has been shown to be precipitated by phosphotungstic acid and it is suggested that it is probably a nitrogenous base, though not a purine derivative. Investigation reached this point in 1930, and does not seem to have progressed since. The fresh liver, if to be stored for any length of time, has to be frozen immediately upon extraction from the animal and held at 20° F. or below to prevent deterioration. It is then minced or finely ground and extracted by prolonged agitation with warm water. From the resultant mass, liver protein and heat coagulable protein are precipitated, and the liquor filtered off. The aqueous extract is then concentrated to a sirupy liquid by evaporation under high vacuum, and treated with alcohol, which throws down the alcohol-coagulable nitrogenous matter, which is filtered off. The alcochol filtrate is concentrated by vacuum distillation, and the concentration is further dried *in vacuo* until the moisture content has been reduced to below 3%.—C. P. CALLISTER and H. G. OSBORNE. *Australasian J. Pharm.*, 16 (1935), 32. (T. G. W.)

Pituitary—Diabetogenic, Thyrotropic, Adrenotropic and Parathyrotropic Factors of. A review of the literature concerning the several physiologic rôles exercised by the pituitary.—J. B. COLLIP. *J. Am. Med. Assoc.*, 104 (1935), 916. (M. R. T.)

Pituitary—Diabetogenic, Thyrotropic, Adrenotropic and Parathyrotropic Factors of. 1. Diabetogenic Substance. A review of existing evidence relating to the diabetogenic substance of the pituitary.—J. B. COLLIP. *J. Am. Med. Assoc.*, 104 (1935), 827. (M. R. T.)

Resorcinol (Fructose) Reaction in Cerebrospinal Fluid. Roe's method for determining fructose in blood, applied to spinal fluid, gives an average value of 4.1 mg. per 100 cc. The reducing substance has the biological properties of fructose. The quantity found is in proportion with the glucose present. It is supposed that a product of rearrangement of glucose, as occurs under the influence of alkali, is responsible for the reaction.—ROGER S. HUBBARD and HELEN R. GARBUTT. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 986. (A. E. M.)

Serum Iron—Method for the Estimation of. The total iron in the serum is determined by ashing 2 cc. with 2 cc. of sulphuric acid and 30% hydrogen peroxide. It is diluted to 15 cc. with water, oxidized with permanganate and shaken with 5 cc. ethyl acetate and 5 cc. of a 20% ammonium thiocyanate solution. The color of the ethyl acetate layer is compared colorimetrically with a standard containing 0.005 mg. of iron. A blank test must be run besides. The iron corresponding to the hemoglobin dissolved in the serum is determined by the benzidine method. Mix 2 cc. of the benzidine reagent with 0.5 cc. serum, add 0.5 cc. water and 1 cc. 0.6% hydrogen peroxide. Prepare another test using 0.5 cc. of a standard blood solution, containing 0.05 mg. of hemoglobin per cc. instead of 0.5 cc. of water. Reading is done after development of the color in the usual way. The blood protein present prevents full development of the color. The second test serves to determine the percentage of hemoglobin, and a corresponding correction is applied to the first test. Finally, the mg. of hemoglobin per 100 cc. are computed as micrograms of iron by multiplying by the factor 3.35.—FRANKLIN C. BING and RAMON F. HANZAL. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1013. (A. E. M.)

Sex Hormones—Female. A general review is given. The clinical possibilities of follicular hormone (progynon) and corpus luteum hormone (proluton) are discussed.—ANTONIO J. SCHIAVO. *Semana méd. (Buenos Aires)*, 42, 1 (1935), 819. (A. E. M.)

Sex Hormones. I. Hormones of the Anterior Hypophysis. A brief historical and chemical review of hormone literature, especially the hormones of the anterior hypophysis.—C. R. ADDINALL. *Merck Report*, 44 (1935), 4–6. (S. W. G.)

Sex Hormones—Review of. A detailed description of the changes involved in the process of menstruation, and a microscopic study of the development of a mature ovary and the stages in the production of a mature ovum is given. The origin and impulse for the profound changes in the uterus were first sought in the nervous system, but it was soon realized that the ovary was the causal factor. There follows a presentation of the several hormones as to their source, production, chemical constitution as far as is known, effects which they produce, and the units for tests which have been established. The hormones taken up are: the follicular hormone, the corpus luteum hormone, the anterior and posterior lobe pituitary sex hormones, other hormones of the pituitary, and the interrelationship of the various endocrine glands. Some results of clinical use of some of the sex hormones are given.—R. JOACHIMOVITS. *Scientia Pharm.*, 6 (1935), 25. (M. F. W. D.)

Testicular Hormones. Clarification of Constitution of Androsterone. Explanatory and critical data on the work of R. *et al.*, Cook, *et al.*, and Butenandt, *et al.*, regarding the structural formula of androsterone. R. *et al.* maintain that their synthesis of androsterone is the first unequivocal proof of the derivation of a sex hormone from a sterol.—L. RUZICKA, M. W. GOLDBERG and H. WIRZ. *Helv. Chim. Acta*, 18 (1935), 61; through *Squibb Abstract Bull.*, 8 (1935), A-378.

Vitamin A—Effects of Cottonseed Meal on Stability of, in Cod Liver Oil. Since cottonseed is known to contain antioxidant substances capable of protecting the oil against rancidity, and common experience shows that this protection applies to the residual oil in cottonseed meal, the latter suggests itself as a possible factor in controlling the keeping quality of cod liver oil and in preserving vitamin A in mixed feeds. This preservative effect is obtained in high degree only by intimate mixing of cod liver oil with the meal. Feeding points are described which illustrate this fact.—H. G. MILLER. *Oil and Soap*, 12 (1935), 51–52; through *Chem. Abstracts*, 29 (1935), 2663.

Vitamin B. A brief review of literature dealing with vitamin B is given. A probable structure of the vitamin B molecule is pictured.—ANON. *Merck Report*, 44 (1935), 13–14. (S. W. G.)

Vitamin B—Relation of, in Foodstuffs. This work deals with the relationship between the B-vitamins and the protein fat and carbohydrate content of the food. The author's investigations, conducted with white mice, led him to the conclusion that vitamin B_1 ($+B_4$) bears a quantitative relationship to the carbohydrate content of the diet, and that vitamin B_2 bears a similar relationship to the fat content of the diet and probably also to its protein content.—P. VOGT-MÖLLER. *Lancet*, 228 (1935), 275. (W. H. H.)

Vitamin B_1—Method for Obtaining. Vitamin B_1, which has been adsorbed by an adsorption agent such as fuller's earth, may be removed by the use of hydrochloric or sulphuric acid solution of a concentration of at least 5%. Use of alcohol with the acid facilitates the removal, and the acid solution obtained may be partially neutralized to a p_H of 5 to 7.—ELMER H. STUART (to Eli Lilly and Co.). U. S. Pat. 1,990,961, Feb. 12, 1935. (S. W. G.)

Vitamin Standards—International. The Second International Conference on Vitamin Standardization adopted pure β-carotene as standard for vitamin A; standards for vitamins B and D remain unchanged. *l*-Ascorbic acid has been adopted as standard for vitamin C, unit activity being defined as the vitamin C activity contained in 0.05 mg. of pure *l*-ascorbic acid.—*J. Soc. Chem. Ind.*, 54 (1935), 289. (E. G. V.)

Vitamins—Standardization of. Report of Second International Conference. At the second international vitamin conference in London (June 1934) the following standards were adopted: vitamin A, pure β-carotene, the international unit being 0.6γ; for vitamin B_1, the adsorption product prepared in the medical laboratory of Batavia, the international unit being 10 mg. of this product; for vitamin C, *l*-ascorbic acid, the international unit being 0.05 mg.; and for vitamin D, the standard solution of irradiated ergosterol adopted in 1931, the international unit being 1-mg. solution which is equivalent to 0.025γ crystals of vitamin D.—L. RANDOIN. *Bull. soc. chim. biol.*, 17 (1935), 67; through *Squibb Abstract Bull.*, 8 (1935), A-374.

ANALYTICAL

Alkaloidal Drug Extracts—The Air-Lift Extractor Applied to the Analysis of. Since extraction of alkaloids from pharmaceutical preparations consumes much time, automatic devices have been suggested, but most of them are unsuitable because they depend on refluxing of the solvent by heat with possible decomposition of alkaloid and because of the difficulty of knowing when extraction is complete. The air extractor operates at room temperature and is provided with a stop-cock so that samples may be drawn off and tested. Following is the method: "The large tube of the apparatus is filled nearly to the overflow with chloroform, the preparation to be extracted is superimposed upon it and made alkaline with ammonia. A small quantity of chloroform is placed in the smaller tube, 40 cc. of 5% sulphuric acid is added and then chloroform until the top of the acid layer is almost to the inlet. The air (or nitrogen) is allowed to enter and extraction continued until all of the alkaloid is deposited in the acid layer. This point may be determined by removing a small quantity of chloroform solution through the stop-cock at the bottom of the tube and testing it in the usual manner with Mayer's reagent. About four hours are required for the complete extraction of the alkaloid. The acid is then removed from the tube, the tube rinsed with water and the final extraction made with chloroform in a separator after making the acid solution alkaline with ammonia." A series of extracts checked against the U. S. P. X shows agreement within limits of experimental error.—L. D. SEIF and T. H. RIDER. *J. Am. Pharm. Assoc.*, 24 (1935), 267. (Z. M. C.)

Alkaloidal Salts—Titration of. Use of Porrier Blue as Indicator. The adoption by certain Pharmacopœias of titrimetric methods for the determination of purity and identity of alkaloidal salts led the authors to determine, by titration with 0.1*N* sodium hydroxide, the equivalence numbers (D. A. B. VI) of 28 alkaloidal salts. Estimations were conducted in different titration media, *viz.*, water, water-alcohol, water-chloroform, chloroform-alcohol, alcohol and acetone, using phenolphthalein and Porrier blue as indicators. The limitations observed in the determination of equivalence numbers by following different titration techniques are discussed. Porrier blue is, in general, a more satisfactory indicator than phenolphthalein because of its sharp end-point, but it cannot be used for the titration of all alkaloidal salts. Porrier blue was shown, by analysis of three specimens, to possess a variable composition. Photometric and light absorption studies indicated decided color instability on the alkaline side, but greater stability over the acid p_H range.—E. REIMERS. *Arch. Pharm.*, 273 (1935), 140. (L. L. M.)

Alkaloids—Quantitative Determination of, with Bromine. Previous workers had shown that small amounts of quinine and some other alkaloids could be estimated quantitatively by means of an aqueous bromine solution, the method depending on the absorption of the bromine, the end-point being disappearance of yellow color. These reports indicated the method to be inapplicable to atropine, cocaine, morphine, sparteine and some others. In the present study the investigation has been carried further. The general method of procedure is given in detail and also two modifications. Consideration has been given to a number of factors. Time of reaction varies greatly. Addition of chloroform, which may be useful sometimes, requires only a brief time. Addition of apomorphine gives more satisfactory results in cases of very low concentration and the reaction is very rapid. Sulphuric acid accelerates the reaction in some cases. Concentration of bromine solution and of hydrochloric acid as well as concentration of solution to be tested were studied. Volatilization of bromine is negligible with rapidly acting substances but requires consideration for slowly acting ones and means of minimizing this loss are reported. Nature of light and background were considered. Cloudiness in chloroform occurred sometimes from unknown causes, so, little valuation can be put upon it. Results presented were based on thousands of test-tube examinations. A short description is given for each of the following: amidopyrine, antipyrine, apomorphine hydrochloride, brucine sulphate, caffeine, codeine sulphate, cinchonidine and cinchonine, dionine, emetine, morphine sulphate, procaine and tutocaine, quinine and quinidine, strychnine sulphate, theobromine, picrotoxin, salicin, salicylic acid. Koppeschaar's Solution was used and in general the error was about 0.5% in concentrations of about 1–1000. The error in estimation of substances in solutions of unknown concentration increases with the dilution but some may be determined in concentrations of 1–1,000,000 with 5 to 10% error. Estimations are made with controls in which attention must be paid to concentration, temperature, rate of reaction and other factors discussed in the paper.—ROBERT A. HATCHER and ROBERT L. HATCHER. *J. Am. Pharm. Assoc.*, 24 (1935), 262. (Z. M. C.)

***p*-Aminobenzoic Acid—Determination of Esters of.** The author describes a method for the gravimetric determination of *p*-aminobenzoic acid. The acid as such, or that obtained by saponification is diazotized and coupled with beta-naphthol. The resulting substance (beta-naphthol-1-azo-4-*p*-aminobenzoic acid) which is soluble in water acidified with hydrochloric acid may be collected, dried at 100° and weighed. When the acid must be obtained by saponification (cycloform and novocaine) one boils with sodium hydroxide and separates the resulting impurities from the acid by shaking with chloroform. The alkaline solution or the acid solution (after acidifying) may be thus shaken out. In both cases the aminobenzoic acid remains in the aqueous portion.—I. FLODERER. *Ber. Ungar. Ph. Ges.* (1935), 314; through *Pharm. Weekblad*, 72 (1935), 397. (E. H. W.)

Analytical Methods—Notes on Some, with Special Reference to Their Teaching Value. The paper draws attention to some recent methods of volumetric analysis, which should be recommended for teaching purposes. Notes are given on the subject of adsorption indicators, such as soluble fluorescein, eosin and dichlorofluorescein. The volumetric method for the assay of sodium sulphate is discussed. For commercial purposes, the gravimetric method seems to be satisfactory, but the method of Rivett (*Chem. News*, 118 (1919), 253) serves better as a teaching method. The procedure is as follows: Weigh out about 4 Gm. sodium sulphate, dissolve and add to an excess of recently precipitated barium oxalate, heat on a water-bath for 10 minutes. Transfer to a 250-cc. flask, cool, make up to volume and titrate aliquot portions of the filtered liquid. The author advocates the use of titanous sulphate in place of titanous chloride for teaching purposes, as the chloride oxidizes so rapidly.—A. T. S. SISSONS. *Australasian J. Pharm.*, 16 (1935), 180. (T. G. W.)

Ascorbic Acid (Vitamin C)—Sensitive Spot Reaction for. The principle of the reaction is the reduction of potassium ferricyanide by an acid solution of ascorbic acid and the conversion of the resulting potassium ferrocyanide to Prussian Blue. *Solutions.*—(1) 8% acetic acid; (2) ferric sulphate solution. One gram of C.P. anhydrous ferric sulphate is dissolved by boiling with 80 cc. of distilled water and 18 cc. of 85% phosphoric acid. A 1% solution of potassium permanganate is then added dropwise to the appearance of a weak rose coloration, the solution is boiled for several minutes and diluted, after cooling, to 100 cc.; (3) 0.4% potassium ferricyanide solution. The ferricyanide must be chemically pure and free from ferrocyanide. *Test.*—Macerate several grams of the plant or organ tissue with a two- or threefold quantity of hot 8% acetic acid

in an Eprouvette with a glass tube having a pointed edge. One drop of the acid extract is placed upon a double filter, the second filter paper being used for the test. One drop of the ferricyanide solution is placed upon the filtered drop and then a drop of the ferric sulphate solution is added. In the presence of not less than 0.003 mg. of ascorbic acid per 0.05 cc., a blue coloration is produced within one-half minute. If the coloration does not appear within one minute the test must be regarded as negative. Urea does not interfere; sugar solutions interfere only after boiling with alkalies. Large quantities of cysteine, glutathione and pyrogallol interfere, but usually not in the quantities in which they occur in the tissues. In important cases the chemical test should be confirmed by the biological method. For a quantitative determination, cf. H. Tauber and I. S. Kleiner, *J. Biol. Chem.*, 108 (1935), 563.—H. TAUBER. *Mikrochem.*, 17 (1935), 111. (L. L. M.)

Carbon Tetrachloride—Determination of, in Chloroform. The Danish and Swiss Pharmacopœias are the only two which aim to eliminate the impurity, carbon tetrachloride from chloroform. The amount of carbon tetrachloride is determined as follows: 20 Gm. of chloroform is fractionally distilled in a round bottom flask until there remains only 1 cc. One gram of this is shaken with 150 Gm. of water until completely dissolved. The assay is based on the difference in boiling points of chloroform (60–62°) and carbon tetrachloride (76–77°) and on the difference of solubility in water. The sensitivity of this assay is given by the Danish Pharmacopœia as 2% of impurity. If 3% or more impurity is present, a cloudy liquid is obtained. This method is rapid and effective.—M. E. H. MADSEN. *J. pharm. chim.*, 21 (1935), 246. (M. M. Z.)

Castor Oil—Solubility of. Distribution Coefficient between Oil and Water of Substances Completely Miscible in Two Solvents. The distribution coefficient of methyl alcohol was determined in the system castor oil and water by determination of the alcohol in the water before and after agitating with the oil, and was found to be 0.12, a slightly smaller value than that obtained for ethyl alcohol, 0.15. With acetic acid the technique consisted in determining this alkalimetrically and directly in the water before and after agitation with the oil using a $N/60$ solution of sodium carbonate of which 1 cc. corresponded to 1 cc. of acid, with the indicator phenolphthalein. The coefficient of distribution of acetic acid remained constant for a given concentration and varied little but irregularly with the concentration. At 0.1–0.25%, the value lay between 0.216 and 0.239, and at 10% was equal to about 0.2. Thus the values for the distribution coefficient of acetic acid and methyl alcohol are not similar, though both possess the characteristic of miscibility with water and with castor oil.—A. LINDENBERG. *Compt. rend. soc. biol.*, 118 (1935), 441, No. 5; through *Squibb Abstract Bull.*, 8 (1935), A-459.

Chromium Pigment—Micro-reaction of. Chromate and bichromate give a violet coloration passing over to red with a 1% solution of strychnine in concentrated sulphuric acid. Trivalent chromium ion must be oxidized to chromate before the color test is given. Hydrogen peroxide may be used as the oxidant. The reaction is carried out by the spot method. The limit of sensitivity is 0.98 microgram CrO_4^{--}, corresponding to 0.348 microgram of chromium. Interfering ions are manganese, cobalt, ferricyanide and ferrocyanide, although their effects may be removed by suitable precautions.—S. AUGUSTI. *Mikrochem.*, 17 (1935), 17. (L. L. M.)

Citrus Oils—Value of Ultraviolet Fluorescence as Test for. Determination of Substances Producing the Fluorescence. An attempt recently made by E. Bottini to determine the substance or substances responsible for the magnificent fluorescences shown by citrus oils exposed to ultraviolet light and examined under suitable conditions. His results are presented in *Annali della Sperimentazione Agraria*, 15 (1934), 61–78, published in Rome. He gives brief descriptions of the colors excited by ultraviolet rays falling upon intact fruits of orange, lemon, mandarin, bergamot, cedrat and grapefruit. His principal interest was to trace the substances responsible for the fluorescence, and for this purpose he used the pure essential oils of mandarin, sweet orange, bergamot and lemon at three concentrations: undiluted, and diluted with absolute alcohol to contents of 0.17 and 0.0034 per cent of oil. Spots on porcelain showing the various colors are listed. The next step was to place drops of the same four oils at the same three concentrations upon filter paper, and to examine their fluorescence in that condition. The colors thus obtained were not quite the same as those obtained upon porcelain, owing to the varying diffusibilities of constituents of the oils. He discusses the substances responsible for the intense blue fluorescence of the four oils named when these are examined under ultraviolet light. This report is of special interest to perfumers.—HUGH NICOL. *Perf. and Ess. Oil Rec.*, 26 (1935), 85. (A. C. DED.)

Copper—Modified Iodimetric Method of Determining. The weighed sample of copper is

dissolved in nitric acid, 5 cc. of 6*N* sulphuric acid is added and nitric acid removed by evaporation. After dissolving in 20 cc. of water, 2–3 Gm. of potassium iodide is added and the titration with sodium thiosulphate carried out as usual till most of the free iodine is exhausted. After adding starch solution, the titration is continued nearly to the end-point and approximately 2 Gm. of ammonium thiocyanate is added and dissolved by thorough stirring. The blue color deepens. Titration is continued to a sharp end-point, the precipitate turning white.—H. W. FOOTE and JOHN E. VANCE. *J. Am. Chem. Soc.*, 57 (1935), 845. (E. B. S.)

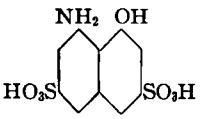
Copper—Potentiometric Estimation of. The estimation of copper in the form of copper sulphate in sodium acetate-acetic acid buffers previously described (*J.*, 10 (1932), 41) can be carried out without the addition of free acid. This obviates the judging of the proper amount of acid to be added before titrations. The most suitable range for making up the copper sulphate solutions is between p_H 3 and 6. Above p_H 6, the error rises rapidly. The potentials at the end-point have been found to rise with the p_H.—C. PRASAD and J. B. JHA. *J. Indian Chem. Soc.*, 12 (1935), 1; through *Squibb Abstract Bull.*, 8 (1935), A-501.

Copper—Use of Potassium Stannous Chloride in the Volumetric Determination of. A volumetric method of determining copper is described. The method is based upon the reduction of the copper in hydrochloric acid solution in the presence of sodium bicarbonate (to produce an atmosphere of carbon dioxide) with an excess of potassium chlorostannite and titrating the excess reagent with 0.1*N* iodine solution. The error in the determination of 0.02 Gm. of copper as copper sulphate was 0.4%.—EMM. VOYATZAKIS. *Bull. soc. chim., mem.* (5), 1 (1934), 1356; through *Squibb Abstract Bull.*, 8 (1935), A-532.

Cupric and Ferric Ions—*p*-Aminophenol Hydrochloride as a Reagent for. A 2% alcoholic solution of *p*-aminophenol hydrochloride gives with cupric and ferric salts a blue-violet precipitate. The reaction may be applied macro- or microchemically (as a spot method). As limits of sensitivity were found: Cupric ion: macromethod 0.15 mg., micromethod 0.2γ; Ferric ion: macromethod 0.013 mg., micromethod 0.069γ. Other ions do not interfere. The coloration is intensified by acetic acid. The precipitates are apparently complex salts.—S. AUGUSTI. *Mikrochem.*, 17 (1935), 118. (L. L. M.)

Derris Root—Determination of Rotenone Content of. A critical study of the polarimetric method of Danckwortt and a modified Roark method. The former gives the lower values. In the opinion of the author, a standard method worthy of adoption has not appeared as yet.—P. A. ROWAAN. *Arch. Pharm.*, 273 (1935), 237. (L. L. M.)

Diothane Solution—Stability of. II. It was reported previously that prolonged aging or heating of diothane solutions caused slight decomposition, the substance formed being either an aminobenzoate formed by rearrangement or aniline formed by hydrolysis. A detailed study of the hydrolysis of diothane using alcoholic potash has shown that aniline is formed. When diothane solutions are diazotized and coupled with beta-naphthol, the color is concentrated upon the precipitate of diothane free base, so that small amounts are detectable but quantitative color comparison is difficult. The standard colorimetric procedure for aniline (use of bleaching powder) proved inapplicable. Color was not sufficient for quantitative comparison when the reaction was potentiated with phenol. A diazotization has been developed using H-acid instead of beta-



naphthol. Carried out in presence of alcohol it proved very sensitive; concentrations as low as 1:10,000,000 can be detected qualitatively. Details of procedure are given and results of a number of experiments are tabulated and discussed. It was found that maximum concentration produced by sterilization is 1:20,000 in unacidified solution, 1:30,000 in acidified. Ordinary solutions show 1:350,000, too slight a change to affect potency. Addition of acid inhibits formation of aniline. So long as diothane solution is colorless and clear, anesthetic potency is unchanged. If cloudy or colored it should not be used.—E. S. COOK, K. BAMBACH and F. H. RIDER. *J. Am. Pharm. Assoc.*, 24 (1935), 269. (Z. M. C.)

Drugs—Quality of. In a report from the government medical stores at Amsterdam covering the year 1934 the author states that most of the samples examined met the required standards.

About a score were rejected. Some of the samples were as follows: Aniline—too low a boiling point; potato starch—20.2% water (max. allowed 16%); lactic acid—sp. gr. too low (1.197), low grade; sodium acetate—sublimate test gave a precipitate, the permanganate test remaining negative; aqua ammonia (25%)—contained lead; ether for anesthesia—gave a strong Nessler reaction even though the ether was preserved with copper; benzol—sp. gr. too low (0.881), N_{20}^{D} = 1.501, contains carbon disulphide and thiophene; magnesium carbonate—contained too much calcium; reduced iron—contained zinc; powdered iron—contained copper and arsenic; bismuth subgallate—contained too much nitrate, calcium, sodium and potassium; gelatine—several samples were refused on positive sulphur dioxide reactions; papaverine hydrochloride—contained morphine; oil chaulmoogra—rotation, etc., was satisfactory but the oil was not soluble in two volumes of absolute alcohol; oil gaultheria—was methyl salicylate; zinc oxide—contained lead; pastilles mercury oxycyanate—underweight, mercuric cyanide content 40.7% (req. 41%); tin (powdered) and tin oxide—contained lead; aluminum sulphate—did not meet the solubility requirement in water; talcum—contained 16% hydrochloric acid-soluble material. The author also discusses the methods of analysis used.—T. ROSEBOOM. *Pharm. Weekblad*, 72 (1935), 392.

(E. H. W.)

Dulcin. Sweetening Agents. II.—Microchemical Studies of. The authors compiled a table of the solubility of dulcin in different liquids from the literature reports and from determinations made by themselves. They determined solubilities in trichloroethylene, tetrachloromethane, dichloroethylene, ethyl ether, petroleum ether and in mixtures of trichloroethylene with methyl alcohol and ethyl alcohol. The Jorissen reaction is inhibited by fats and resins such as exist in beer and is made uncertain by the use of lead peroxide which, in large quantities, masks the color developed and which, in small quantities, is responsible for a violet coloration. Ceric acetate and benzoyl peroxide were found to be superior to lead peroxide as oxidants. For the detection of dulcin, the following procedure was followed: One hundred cc. of the suspected liquid are clarified with 10 cc. of saturated copper sulphate solution and 20 Gm. of dry slaked lime, after which the precipitate is filtered off and washed with about 30 cc. of water. The filtrate is neutralized with acetic acid, made slightly alkaline with excess sodium hydroxide, again filtered, then extracted three times with 50 cc. of ethyl acetate, the aqueous layer having been saturated with sodium chloride before the last extraction to salt out the dissolved ethyl acetate. The ethyl acetate is removed by distillation, the residue dissolved in 2–3 cc. of alcohol and the solution, which has been transferred to a small evaporating dish, is mixed with a knife point of yellow lead oxide. The mixture is taken to dryness on a water-bath, then stirred with a glass rod and finally dried again on the water-bath. The powder thus obtained is extracted with three 5-cc. portions of ether, the combined ether extracts are filtered, the filtrate is collected in a test-tube and evaporated to dryness. The residue is warmed with 1 cc. of water and 3 drops of Jorrisen's reagent (4 Gm. yellow mercuric oxide dissolved in diluted nitric acid and to which diluted sodium hydroxide is added to form a distinct precipitate, the filtrate from the mixture being diluted to 25 cc.) are added. The solution is heated 3 minutes on a water-bath and 2 drops of cerium acetate solution are added (the acetate solution is prepared by dissolving 1 Gm. cerium nitrate or sulphate in acidulated water, then precipitating with excess ammonia; infusorial earth is added, the solids filtered off and washed well with water; the precipitate and filter are treated with 2–3 cc. acetic acid, filtered and diluted with the washings to make 50 cc.). In the presence of dulcin, a violet coloration results. Very often a yellow precipitate comes down on heating the test sample with the mercuric nitrate; in such cases it is advantageous to filter hot through a Witt plate and test the filtrate for dulcin. It is helpful also to add a drop of diluted acetic acid, whereby a portion of the precipitate remains dissolved and the reaction is more distinct. Benzoyl peroxide is a somewhat less sensitive reagent for dulcin than is cerium acetate. Heating dulcin in glacial acetic acid saturated with potassium nitrate gives a non-specific yellow coloration.—V. STANEK and P. PAVLAS. *Mikrochem.*, 17 (1935), 22.

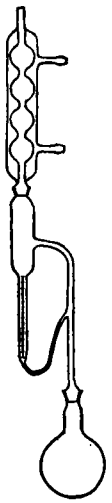
(L. L. M.)

Elektrargol, Kollargol, Argyrol and Protargol—Identification and Differentiation of. Add 1 cc. of a 10% solution of sodium iodide to 2 cc. of the unknown solution, and then add 5 cc. of water and 10 drops of a 10% solution of saltpeter, and then add to this a solution of ammonium molybdate. The following results are noted: in the case of Kollargol, a reddish brown precipitate forms which changes immediately to dark blue, this color can be noticed in the supernatant liquid even after the precipitate has settled. With the same procedure we get a brown flocculent

precipitate with Argyrol, which changes after 1 minute to bluish green and the supernatant liquid remains yellowish green. In the case of Protargol, the precipitate is yellow and sets much slower than in the case of Argyrol, and the supernatant liquid is orange-yellow. If sodium chloride or sodium bromide is used in place of sodium iodide, then the colors of the precipitates are different and can be told apart among the samples used. Elektrargol can be told apart from Kollargol in that it does not change on the addition of a few drops of concentrated sulphuric acid, while with Kollargol we get a brownish red precipitate. On addition of potassium persulphate to the Kollargol precipitate, we get a violet precipitate which finally dissolves; while the brownish solution of Elektrargol becomes a clear yellow solution. Further identity tests are given in the original article.—G. CONSTANTINESCU. *Curierul farm.*, 4, Nr. 9 (Sept. 1934), 4–8; *Chem. Militarzentrallb.*; through *Chem. Zentr.*, 106 (1935), 929. (G. B.)

Ether—Reaction for Peroxide in. If 1–2 cc. of ether is allowed to evaporate in a porcelain dish and 1 drop of alcohol, 1 drop of benzaldehyde and 1 drop of strong sulphuric acid added, an eosin-red color will be developed if peroxide is present.—A. CASTIGLIONI. *Ann. Chim. appl. Roma*, 24 (1934), 209; through *Pharm. Weekblad*, 72 (1925), 336. (E. H. W.)

Ethereal Oils—Estimation of, in Drugs. An apparatus for the rapid approximate determination of ethereal oils in drugs is described. Twenty to 30 Gm. of the drug is boiled for one hour with 200 cc. of water. The steam containing the oil is condensed in a reflux condenser, the condensate being collected in a measuring cylinder calibrated to $^1/_{20}$ cc. The volume of ethereal oil obtained is read off and converted by use of the average density of the oil to percentage by weight. The apparatus was found to give satisfactory results. Several sources of error are retention of droplets of oil in the lower part of the condenser, emulsification of the oil in water, and differences in the shapes of the upper and lower meniscus of the oil layer. If the content of oil as determined by the Geyer apparatus is 10% more than the required oil content, the drug may be assumed to be in conformity with the official requirement; otherwise the more accurate D. A. B. VI method must be used.—P. HORKHEIMER. *Pharm. Ztg.*, 80 (1935), 148. (G. E. C.)



Ethyl Phthalate—Determination of, in Essential Oils by Potassium Phthalate Method. Walbaum and Rosenthal have given a method for the determination of ethyl phthalate, based on saponification with caustic potash, filtering, drying and weighing the insoluble potassium phthalate, but did not specify the conditions of carrying out the determination nor the possibilities of interference by other substances. A plea is made for investigation of the reaction.—SÉBASTIEN SABETAY. *Ann. Fals.*, 28 (1935), 100–102. (A. P.-C.)

Extract of Malt. The British Pharmacopœia directs that Malt Extract be made by extracting malted barley with water at a suitable temperature, and evaporation of the liquid under reduced pressure at a temperature not exceeding 55° C., until a viscous product is obtained. It is evident that an extract is desired in which the activity of the diastase has been preserved, but the Brit. Phar. does not set any standard for diastasic activity. Malt Extract intended for consumption in Australia, however, must comply with the Pure Food Regulations of the various states. The diastasic activity in all the states is to be such that 100 grains of extract will convert 250 grains of potato starch into maltose in 30 minutes at 40° C. The Malt Analysis Section, of the Analytical Investigations Committee of the Australian Chemical Institute, has incorporated in the regulations an improved method for this determination of the diastasic activity. The chief points in this method are: the use of soluble starch, the control of the p_H of the solution undergoing digestion by means of ammonium acid phosphate; an iodimetric method for estimating the sugars. It is doubtful, however, whether the standard for diastasic activity has any value, as analysis indicates that the action of this enzyme is almost completely inhibited at hydrogen-ion concentrations prevailing in the digestive tract.—E. I. ROSENBLUM. *Australasian J. Pharm.*, 16 (1935), 173. (T. G. W.)

Gas Analysis—Micro Heat Conductivity Apparatus for. Principles and construction of apparatus are explained and illustrated by diagrams.—P. GROSS and H. STEINER. *Mikrochem.*, 17 (1935), 43. (L. L. M.)

Glycerol—Determination of, in the Presence of Sugars, by Means of Periodic Acid. Periodic acid reacts with glycerols, oxidizing them to formaldehyde and formic acid; however, since

periodic acid attacks sugars as well, it is necessary to first eliminate the sugars. With amounts of sugars such as 1.2% saccharose or 10% glucose, 1 Gm. of barium hydroxide is placed in a 50-cc. flask with 5 cc. of the glycerol-sugar solution, and the mixture placed in an ice chamber for two hours. This volume is then made up to 50 cc. with 95% alcohol, when a precipitate forms, and the flask again placed in the ice chamber for 15 to 20 hours. The mixture is then centrifuged for 2 or 3 minutes, and 25 cc. of the clear supernatant liquid is then withdrawn. This liquid contains the glycerol and very little sugar. The excess barium hydroxide is removed with 20% sulphuric acid and 25 cc. distilled water. This is heated at 95° until the volume is reduced to 20 or 25 cc. The solution is then neutralized with $N/10$ sodium hydroxide. The glycerol can be determined as follows: 5 cc. of the solution is made acid with 5 cc. of $N/10$ periodic acid. Five to 10 cc. of bicarbonate solution is added, as well as 15 cc. $N/10$ arsenous acid solution and a small amount of potassium iodide solution. The excess of arsenous acid is titrated with $N/10$ iodine. A method of calculation of glycerol, as well as a list of results checking this method are given. Where no sugars are present only the latter procedure is necessary for determining the glycerol.—P. FLEURY and M. FATOME. *J. pharm. chim.*, 21 (1935), 247. (M. M. Z.)

Hexamethylenetetramine—Determination of, in Its Anhydromethylene Citrate. The method is based on the solubility of hexamethylenetetramine in chloroform. Neutralize 0.344 Gm. hexamethylenetetramine-anhydromethylene citrate with caustic soda in anhydrous methanol in presence of phenolphthalein, add chloroform during neutralization; sodium anhydromethylene citrate precipitates, while hexamethylenetetramine remains in solution in the chloroform; after neutralization filter, extract the liquid several times with chloroform to obtain a total of 20 cc. of solution; evaporate the latter to dryness, dissolve the residue in 10 cc. of water, add 50 cc. of decinormal acid, boil 30 minutes, and titrate the excess acidity with decinormal alkali.—M. J. SCHULTE. *Aan P. van der Wielen* (1934), 99–108; through *Chimie & Industrie*, 33 (1935), 677–678. (A. P.-C.)

Homeopathic Preparations. VI. Evaluation of Saponin-Containing Tinctures. Saponins are characterized briefly. Homeopathic saponin-containing tinctures are tested qualitatively and quantitatively for saponins. A table of 80 drugs is given, listing for each drug the part official, name of saponin, time for complete hemolysis, hemolytic index and characteristic constituents other than saponin. Frothing, hemolysis and the cholesterol reaction are used to test for saponins qualitatively. The hemolysis test is applied to tinctures as follows: the tincture is evaporated to dryness *in vacuo* and brought to the original volume with physiological salt solution. Defibrinated cattle blood is diluted 1 to 30 with physiological salt solution. Five cc. of this blood solution is mixed in a test-tube with 5 cc. of the alcohol-free tincture. The time for complete hemolysis is measured. A 0.1% solution of pure white saponin (Merck) is used as a control. All hemolysis tests are repeated after shaking out the saponin solution with a 3% acetone solution of cholesterol; these tests should be negative. Primary homeopathic tinctures and triturations of fresh plants with sugar are prepared and their saponin content determined. Results, recorded in a second table, show that the use of diluted alcohol in preparing tinctures increases the saponin content of extracts. The hemolytic index of extracts prepared with 25% alcohol is invariably raised.—A. KUHN and G. SCHAFER. *Pharm. Ztg.*, 80 (1935), 257. (G. E. C.)

Hydrocyanic Acid—Determination of, in Plants. Hydrocyanic acid probably never occurs free in plants, but is combined with a sugar residue and an aldehyde or ketone to form a glycoside. The determination of the acid involves the decomposition of the glycoside and the separation and estimation of the acid. Only about 20% of the total glycoside is thus hydrolyzed. A suggested method is given involving the complete hydrolysis of the glycoside. The method employed has been to supply the deficiency of enzyme by the addition of emulsin, taken from the sweet almond. The sweet almond is ground to a fine powder and tested before use for the presence of hydrocyanic acid by means of sodium picrate paper. The plant material is cut up with scissors or ground to a coarse powder. A quantity up to 20 Gm., depending upon the amount of acid thought to be present, is weighed, transferred to a distilling flask, the side tube of which is closed by a short piece of rubber tubing. About 250 cc. of distilled water and 5 Gm. of powdered almonds are added. The flask is stoppered and allowed to remain 24 hours at room temperature, and the contents are steam distilled, the distillate being collected in 100 cc. of 1% sodium hydroxide solution. After two hours, all the hydrocyanic acid is removed, and about 600 cc. of distillate have been collected. This is rendered slightly acid with concentrated hydrochloric, excess of sodium bicarbonate is

added, and the liquid titrated with standard iodine solution.—H. FINNEMORE and C. H. WILLIAMS. *Australasian J. Pharm.*, 16 (1935), 40. (T. G. W.)

Injections—Hydrogen-Ion Concentration in. The disadvantage of colorimetric methods for determination of hydrogen-ion concentration or p_H is that one person can match colors more accurately than another, and the presence of coloring matter in the substance of which the p_H value is to be determined causes difficulty, although there is a compensating apparatus for use in such cases. The electrolytic method is much more accurate and gives the correct p_H to two places of decimals. The p_H is of great importance in the preparation of pharmaceutical products. Insulin must be extracted in acid solution; it is destroyed if it comes in contact with pancreatin. If the p_H is kept just below 7 (slightly acid) adrenaline can be boiled and autoclaved, but if the p_H rises above 7 (alkaline) oxidation may set in, a color develop and finally a precipitate. Apomorphine oxidizes if the p_H is higher than 7 and a green color appears. A number of glucosides, such as strophanthin and digitalin, are stable at about the point of neutrality, but on either side of this the rate of hydrolysis is increased. In sterilization p_H is important. The factors which affect the well-being of bacteria are food, supply of water, temperature and p_H. The p_H of the media in which bacteria are to be grown must be carefully adjusted. Some substances are best kept slightly alkaline, while others are best kept in the acid condition.—H. BERRY. *Pharm. J.*, 134 (1935), 214. (W. B. B.)

Iodide Ion—Microchemical Investigation of. The iodide ion may be detected by the two following spot reactions: (1) With an ammoniacal solution of mercuric ammonium nitrate (reagent of Ciusa and Terni, *i. e.*, 10 Gm. of mercuric nitrate dissolved in 50 cc. of water and 5 cc. of nitric acid, with 60 cc. of concentrated ammonia water then added to the mixture). A yellow or orange-yellow precipitate is produced in the presence of iodide ($Hg_2N.I$). The limit of sensitivity is 0.22γ of iodine. (2) With a diluted solution of sodium hypochlorite and a 1% solution of magnesium sulphate (reagent of S. Augusti), a brown precipitate is produced. The limit of sensitivity is 9γ of iodine.—S. AUGUSTI. *Mikrochem.*, 17 (1935), 113. (L. L. M.)

Lard—Estimation of the Water Content of. Various methods are considered with respect to ease of execution and rapidity. A suitable method for the rapid and approximate determination of the water content of lard is as follows: On solution of a 1.0-Gm. sample in 5 cc. of benzene at 20° C., lard containing up to 0.5% water gives a clear solution; lard containing 0.6% water gives a slightly turbid solution, lards containing larger amounts of water give greater turbidity; and lard containing 1.0% water gives a heavy milky turbidity.—FRIDA GRAF. *Scientia Pharm.*, 6 (1935), 42. (M. F. W. D.)

Lead—Identification of, in Pharmaceutical Preparations. The weaknesses of several methods of determining lead qualitatively are pointed out. The method suggested by the authors depends upon the oxidation of the lead salt to lead dioxide which will give an intense blue color with an acetic acid solution of benzidine. Procedure: A drop of the solution to be tested is absorbed in filter paper, a drop of 3*N* sodium hydroxide added, then a drop or two of saturated bromine water, about two drops of ammonia solution (1:1) to destroy the excess oxidizing agent and the excess ammonia expelled by fanning over a flame, and finally a drop of acetic acid benzidine solution is added. A deep blue color develops in the presence of lead. The test is sensitive to one microgram of lead or a dilution of 1 to 50,000. For more dilute solutions, the test is altered as follows: About 10 cc. of the solution to be tested are treated with 3 cc. of sodium hydroxide, 2 cc. of bromine water, the mixture boiled and filtered through a quantitative filter, the filter washed with ammonia water, then with hot water and an acetic acid solution of benzidine is dropped on. In the presence of 10 micrograms of lead in 10 cc. or a dilution of 1 to 1,000,000, a definite blue color is obtained. The higher oxides of manganese and cerium would produce the same result; however, these ions are not dissolved by the alkaline medium and they will not interfere. Thallium, if present, could give the same color reaction. To test for lead in organic compounds, the preparation is ashed, the ash dissolved in nitric acid, the solution evaporated to dryness and the residue warmed with water and sodium hydroxide, the solution cooled, dropped on filter paper and the test completed as above. To test for lead in bismuth preparations, the residue from ignition is dissolved in nitric acid, the solution evaporated, the residue boiled for two minutes with sodium hydroxide which converts bismuth salts to compounds probably of the formula BiO(OH); then one or two drops of the supernatant liquid are absorbed in filter paper and the test carried out as before.—F. FEIGLE and A. SINGER. *Scientia Pharm.*, 6 (1935), 37. (M. F. W. D.)

Liquid Preparations—Scheme for the Identification of the Simple, of the British Pharmacopœia. The author gives a detailed description of a scheme, and charts by which many of these preparations can be identified.—E. M. WATSON. *Australasian J. Pharm.*, 16 (1935), 176. (T. G. W.)

Meconic Acid—Colorimetric Determination of, in Opium by Means of Gradual Photometer. Separate meconic anhydride from powdered opium by Haan's method by precipitation as lead meconate which is redissolved in 100 cc. of decinormal hydrochloric acid (use 0.75, 0.5 or 0.35 Gm. opium so as not to exceed the solubility of meconic acid in dilute hydrochloric acid); to 10 cc. of the solution add 10 cc. of water and 5 drops of 5% ferric chloride solution; compare the solution in a gradual photometer with a standard solution of meconic acid treated with the same quantity of ferric chloride. The light used is filtered through a green S53 filter. The accuracy of the method is of the order of 0.1%.—C. G. VAN ARKEL. *Aan P. van der Wielen* (1934), 109–116; through *Chimie & Industrie*, 33 (1935), 678. (A. P.-C.)

Medicinal Agents—Standardization of. III. Particle Size and Degree of Dispersion of Important Medicinal Agents. Many physico-chemical properties of drugs are being more widely adopted as criteria of therapeutic value. Solubility and solution and absorption rates in the organism are dependent upon degree of dispersion. Another important consideration is the rapid increase in total particle surface as degree of dispersion is raised. Surface area determines the therapeutic utility of calomel, mercuric oxide, medicinal charcoals and clays. Cross sections, volumes and masses of individual particles; number of particles per mole and total surface area per mole are tabulated for a number of compounds either from direct measurement or by computation, *viz.*, calomel, mercuric oxide, white precipitate and zinc oxide. Degree of dispersion was calculated from particle size (microscopic measurement) and experimentally determined values for specific gravities. Smaller particles of calomel, having greater total surface area, are obtained than by the usual methods of production by chilling the vapors of sublimate suddenly. Likewise mercuric oxide is obtained in smaller particles by precipitation than by heating mercuric nitrate in the presence of metallic mercury. In the case of either compound, there is a parallel between particle size and pharmacological activity. Various existing methods for the determination of particle size within the colloidal range are summarized. Protargol (Bayer), silver proteinate (Heyden), Kollargol (Heyden), colloidal silver (Hageda), Lyogen (Byk-Guldenwerke), Liquor Aluminii Acetici (D. A. B. VI), Liquor Ferri Albuminati (D. A. B. VI), and Liquor Ferri Oxychlorati dialysati were investigated by the method of Siedentopf and Zsigmondy.—R. DIETZEL and K. SAXHOLM. *Arch. Pharm.*, 273 (1935), 170. (L. L. M.)

Methanol—Methods for Detection and Determination of, in Natural Media and Liquids. A critical review and study of existing methods for the oxidation of methanol and determination of the formaldehyde formed proved conclusively that conversion into formaldehyde is not quantitative, nor is it a constant fraction of theoretical yield, and that under certain conditions some formaldehyde is formed from ethanol. All existing methods are therefore unreliable for the quantitative determination of methanol, especially in presence of much larger amounts of ethanol (as most frequently occurs in natural media and liquids); but some of them are satisfactory for its qualitative detection. A new method based on essentially new principles has been developed and will be described in a subsequent publication.—MICHAEL FLANZY. *Ann. Fals.*, 28 (1935), 146–158. (A. P.-C.)

Microscopic Objects—New Method for Picking, Out of Water. The method devised by Don Ernesto Caballero Bellido for the handling of diatoms under the microscope, which is suitable only for dried particles and therefore unsuitable for protozoa and the like, has been modified to make it applicable to the latter cases. Instead of using a single hair, a pair of microscopic "tweezers" (called a "microlab") is constructed by properly attaching two fine hairs to the end of a copper wire so that they project not more than 2 mm. beyond the end of the wire. The technique of the preparation and use of the "microlab" and the auxiliary equipment which has been devised in connection therewith, are described in detail.—VENANCE. *Naturaliste Canadien*, 62 (1935), 142–147, 153–164. (A. P.-C.)

Mineral Pigments—Systematic Method for Microchemical Identification of. The method of differentiation is based upon the differences in behavior of the test samples with diluted nitric acid and upon the usual microchemical reactions for lead, calcium, etc. The following pigments were considered: white lead, chalk, zinc oxide, gypsum, lithopone, lead sulphate and barium sulphate.—S. AUGUSTI. *Mikrochem.*, 17 (1935), 1. (L. L. M.)

Morphine—International Method for Its Determination in Opium. A criticism of the method proposed by the International Commission of the League of Nations. Grinding followed by screening may cause trouble in the case of moist opium. In the assay of the extract, adsorption of soluble substances by the insoluble residue can cause a loss; on the other hand, the extract, which contains an excess of lime, will absorb carbon dioxide during evaporation; the resultant errors, however, are of little importance. No indications are given regarding the purity of the lime; it should be freshly slaked. Use of sintered glass filters is unnecessary, as special filter paper is available for vacuum filtration. The crystals which adhere to the cork stopper must be taken into consideration. The morphine crystals on the filter should be washed with 10 cc. of benzene to remove traces of codeine; moreover, it is advisable to carry out the reaction in centrifuge tubes, the insoluble matter being separated by centrifuging and the determination carried out on an aliquot of the clear liquid, thus reducing the danger of adsorption.—E. C. M. J. HOLLMAN. *Aan. P. van der Wielen* (1934), 117–129; through *Chimie & Industrie*, 33 (1935), 678. (A. P.-C.)

Nitrogen—Simple Method for the Determination of. The method can be used for various nitrogenous substances. As applied to soil the procedure follows: 10 Gm. of soil are weighed into a flask of about 1 liter capacity. Potassium dichromate (about 5 Gm.) and mercuric oxide (about 2 Gm.) are added and the mixture is treated with 15 cc. of water. Concentrated sulphuric acid (30 cc.) is then added in convenient instalments with frequent shaking. A liberal quantity of glass or quartz beads is added to the contents of the flask, which is fitted with an air- or water-cooled condenser and heated to gentle boiling for 30 minutes. The digest is treated with 5 to 7 Gm. of pure zinc dust, diluted to about 200 cc. and boiled for 10 minutes. It is then cooled and distilled with excess of alkali in the usual way.—Y. V. NARAYANAYYA and V. SUBRAHMANYAN. *J. Soc. Chem. Ind.*, 54 (1935), 106T. (E. G. V.)

Ointments and Similar Preparations—Qualitative Examination of, by Means of Filtered Ultraviolet Light. Rapid and simple qualitative tests could be made. The natural colors and colors observed in ultraviolet light of 32 preparations of ointments in the Pharm. Hung. IV are reported. Many commercial samples showed deviations from official prescriptions.—ENDRE J. KOCSIS. *Magyar Gyógyszerésztud. Társaság Értesitöje*, 11 (1935), 99–106; through *Chem. Abstracts*, 29 (1935), 2303.

Olive Oils—Fluorescence of. Influence of Pigments. Olive oils, both "virgin" and refined, contain a group or constituent which produces a blue fluorescence under the action of Wood's light (filtered ultraviolet light of λ approximately 3650Å.). There are also pigments, either pre-existent (in virgin oils) or added intentionally (in recolored refined oils) which produce an orange or red fluorescence which is superposed to the first-mentioned fluorescence. Pigments (chlorophyll, xanthophyll, carotene, etc.) have a decided absorbing effect on the fluorescence produced by the oil. The fluorescence of any given oil is due to a superposition of the three above phenomena. It is concluded that examination by ultraviolet light can be of some use as a rough sorting test; a decided blue fluorescence can be taken as proof that the sample is a refined oil, but otherwise no definite conclusion can be drawn from the test.—J. GUILLOT. *Ann. Fals.*, 28 (1935), 75–78. (A. P.-C.)

Potassium Ion—Detection of, with "Gardinol W." This reagent, an alkyl acid sulphate, to which is assigned the formula $SO_3OH.C_nH_{2n-1}$, gives a positive test for the potassium ion, but is less sensitive than sodium cobaltic nitrite.—B. REICHERT. *Arch. Pharm.*, 273 (1935), 232. (L. L. M.)

Quinaldinic Acid as a Micro-reagent. II. Estimation of Copper and Its Separation from Cadmium, Manganese, Nickel, Cobalt, Etc. Phosphoric, arsenous and arsenic acids do not interfere with the estimation if the washing is carried out as described under the macro-method (*Ztschr. Analyt. Chem.*, 95 (1933), 400). The micro-procedure was as follows: The micro-beaker and the filter-stick, dried at 125° C., was weighed in a Kuhlmann's microbalance. A tiny crystal of copper sulphate was then introduced into it and the beaker with the stick weighed again. The crystal was dissolved in 1–2 cc. of water and the solution was acidified with one drop (0.025 cc.) of 0.5–0.7*N* sulphuric acid. The beaker was then warmed on the water-bath, and to the hot solution of the reagent (1 per cent solution of recrystallized quinaldinic acid) was added, one drop at a time in the beginning, gently rotating the beaker by the hand after the addition of each drop of reagent, and not adding the second drop till the crystals of quinaldinate settled to the bottom.

When the precipitation was complete, four drops of the reagent were added in excess, this amount being independent of the amount of copper present. The precipitate was allowed to settle for five to ten minutes by keeping the micro-beaker in its stand on the water-bath. The supernatant liquid was then drawn off through the filter-stick, and the precipitate washed six times by decantation with hot water, keeping the beaker on the water-bath all the time. Care should, however, be taken that no precipitate enters the filter-stick before the washing is complete, as the fine precipitate often chokes the filter, delaying filtration. Finally the contents of the beaker were sucked dry through the filter-stick, and the beaker with the filter-stick was then dried at 125° for 10–12 minutes in a slow current of hot air in the Benedetti-Pichler drying apparatus. The beaker with the filter-stick was afterward weighed in a microbalance with usual precautions. In an appended table the range of error is shown to be from −0.9 to +0.75 per cent.—P. R. RÂY and J. GUPTA. *Mikrochem.*, 17 (1935), 14. (L. L. M.)

Quinaldinic Acid as a Micro-reagent. I. Estimation of Zinc, and Its Separation from Manganese. The procedure followed was a micro-adaptation of the macro-method by the same authors (*Ztschr. Analyt. Chem.*, 95 (1934), 400) for the estimation of zinc in the presence of manganese, magnesium, alkaline earths, phosphoric and arsenic acids. *Microestimation.*—About 0.6–0.7 mg. of potassium zinc sulphate ($K_2SO_4.ZnSO_4.6H_2O$) were weighed into a micro-beaker and dissolved in 1–1.5 cc. of water. The solution was acidified with 1–2 small drops of glacial acetic acid, heated for a minute on a boiling water-bath and the zinc then precipitated hot as quinaldinate by adding dropwise a solution of quinaldinate (1 Gm. of quinaldinic acid per 100 cc.) in excess of the theoretical requirement by 0.2–1 cc. The solution was again heated for a minute, the precipitate allowed to settle and collected on one side of the beaker. The supernatant liquid was then drawn off through an asbestos mat filter-stick and the precipitate sucked as dry as possible. It was washed 5–6 times with 0.5–1 cc. of hot water. The beaker, with the precipitate and the filter-stick, was heated by placing it for 1–2 minutes on the boiling water-bath to remove all adhering water, then dried for 10 minutes in a current of air at 125° in a Benedetti-Pichler drying apparatus. The beaker, precipitate and filter-stick were weighed in a microbalance after wiping with moist flannel and dry chamois according to prescribed methods. A table of results obtained by both the macro- and micro-methods is given.—P. R. RÂY and M. K. BOSE. *Mikrochem.*, 17 (1935), 11. (L. L. M.)

Ricinolein—Solubility of. Distribution Coefficient, between Neutral Glycerides and Water, of Substances Soluble in All Proportions in Two Solvents. The distribution coefficients of methyl alcohol, ethyl alcohol and acetic acid were determined for the system ricinolein and water and the average value for each found to be 0.23 at 20°.—A. LINDENBERG. *Compt. rend. soc. biol.*, 118 (1935), 444; through *Squibb Abstract Bull.*, 8 (1935), A-459 and A-477.

Sodium Cholate Preparations—Quantitative Determination of. The method is based upon the fact that the bile acids yield cholic acid upon hydrolysis. The bile salts are separated from accompanying mucin and other proteins by extracting the bile salts with hot alcohol, filtering and evaporating the solvent. The bile salts (0.25 Gm.) are heated with 10 cc. of a 10% sodium hydroxide solution for two hours on a water-bath, then cooled, 30 cc. of water added, and 5 cc. of a 5% $BaCl_2$ solution to precipitate the fatty acids. The excess barium in the filtrate is precipitated with sodium sulphate, the solution warmed to enlarge the crystals of the fine precipitate and filtered through a thick filter. The filtrate, acidified with sulphuric acid, is extracted with a peroxide-free ether. The residue remaining after evaporation of the ethereal solution is dissolved in a few cc. of neutral alcohol and titrated with 0.1*N* alkali, using phenolphthalein as an indicator. The method can be used for any of the bile products or preparations.—G. VASTAGH. *Pharm. Zentralh.*, 76 (1935), 189. (E. V. S.)

Spectroscopic Analysis. A fifty-page review with bibliography.—F. PAVELKA and H. MOLTERER. *Mikrochem.*, 17 (1935), 47. (L. L. M.)

Spot Reactions—VIII. Application of, to Detection of Organic Compounds. Tests described for dicarboxylic acids are based upon their conversion to dyes of the fluorescein series by means of concentrated sulphuric acid and resorcinol; tests for keto-acids, upon conversion to fluorescent umbelliferone derivatives by means of the same reagents. Color and fluorescence are tabulated for the following compounds: oxalic, malonic, succinic, tartaric, tricarballylic, malic and citric acids; succinic anhydride, succinimide, normal potassium succinate, asparagine, trimellitic

acid trimethyl ester, naphthoic acid anhydride, saccharin and acetoacetic ester. Full details of the micro-technique are given.—F. F. V. ANGER and O. FREHDEN. *Mikrochem.*, 17 (1935), 29. (L. L. M.)

Strophanthin g- and k- —Identification of, by Microchemical Test. The identification of *g*- and *k*-strophanthin is difficult. The method is based on the micro-determination of the melting point of the hydrazone or osazone of the monosaccharide split out on hydrolysis. About 10 to 20 mg. of strophanthin are treated in a narrow tube with 0.4 to 0.5 cc. of 2% alcoholic hydrochloric acid. The tube is sealed and heated for 10 hours on a water-bath. The entire liquid is then transferred to a micro-beaker and the alcohol carefully evaporated, the residue dissolved in 1 cc. of water, neutralized with sodium carbonate, and then weakly acidified with 1 drop of acetic acid. About 20 mg. of medicinal charcoal is then added and the material allowed to stand for 5 minutes with stirring. The charcoal is removed by filtration and the colorless filtrate evaporated in a micro-beaker on a water-bath until only about 1 drop of liquid remains. One to 2 drops of a freshly prepared solution containing 1 Gm. phenylhydrazine hydrochloride and 1.5 Gm. sodium acetate in 10 cc. water is then added. The walls of the beaker are rinsed with the liquid so as to bring all of the sugar into solution, the liquid then drawn up into a capillary tube, sealed and heated on a water-bath for 1 hour. In order to obtain good crystals, the tube is allowed to cool slowly in the water-bath. Examine the crystals under a microscope. If they look impure or poorly formed, recrystallize them. The tube is then opened at one end, the crystals loosened by means of a glass thread, centrifuged and the supernatant liquid drawn off. Some 30% alcohol is introduced, the tube sealed and heated in a bath until the crystals dissolve. The solution is again allowed to cool slowly, when well-defined crystals are obtained. The crystals are blown onto a slide and then carefully washed between the slide and coverslip with 30% alcohol and then with water. After drying in a warm current of air, the micro-melting point is determined. Sufficient material is obtained for several melting point determinations. In the case of *g*-strophanthin, a melting point of 182–184° is observed, which corresponds to rhamnosephenylosazone. With *k*-strophanthin, a melting point of 224° is obtained which corresponds to that of glucosazone.—R. FISCHER and W. PAULUS. *Scientia Pharm.*, 6 (1935), 32. (M. F. W. D.)

Tonicum—Determination of Arsenic in. The author criticizes the method of van Giffen on the grounds of incomplete destruction of the organic matter affecting the bromine titration and the inaccuracy of the indicator used in the determination of arsenic in Tonicum. He offers the following alternative method: 5 cc. of the "Tonicum" is digested as suggested by van Giffen, the heating being continued until the liquid remains clear for five minutes. After cooling, 20 cc. of water, 2 cc. of *N*/10 permanganate and a small piece of pumice are added, and the mixture boiled exactly five minutes over a low flame. The excess permanganate is removed with a few drops of oxalic acid. One cc. of *N* potassium iodide and 12 cc. of 25% hydrochloric acid are added to the cooled liquid. After exactly 5 minutes it is titrated with *N*/100 sodium thiosulphate, 2 cc. of starch solution being added near the end of the titration. The last drops are added at one-minute intervals with constant agitation. A blank titration is subtracted from the result. One cc. of *N*/100 thiosulphate = 1.46 mg. sodium methylarsenate (−7 mols. of water of crystallization). The author claims results of less than 1%.—J. N. VAN'T SPIJKER. *Pharm. Weekblad*, 72 (1935), 295. (E. H. W.)

Tonicum N. M. P.—Analysis of. Tonicum N. M. P. consists of a 125-cc. package containing a liquid of the following composition: Liquid extract of cola 200 cc.; simple syrup 300 cc.; glycerin 340 cc.; aromatic spirit 29 cc.; tincture cardamon 1 cc.; alcohol 45 cc.; sodium methylarsenate 1 Gm.; tincture nux vomica 10 cc.; saccharated manganese 2 Gm.; sodium biphosphate 37 Gm.; water to make 1000 cc. Sugar is determined by inverting 20 cc. of the liquid with 12 cc. of strong HCl in 68 cc. of water by heating 10 minutes at 68–70°. This is then cooled to 15–20°, transferred to a 500-cc. flask, together with 28 cc. of 4*N* alkali and filled to the mark with water. 5 cc. of this is boiled with Fehling's solution and titrated by the method of Lehmann-Schoorl. The alcohol is determined by distilling 50 cc. of the liquid diluted with 50 cc. of water until the distillate measures exactly 50 cc.; the alcoholic content being determined by the specific gravity of the distillate. Caffeine is determined by treating the distillation residue from the alcohol determination with 4 cc. of 4*N* alkali in a separatory funnel; 50 cc. of chloroform are added and the whole shaken for ten minutes. This is followed by three successive shakings with 25 cc. of chloroform, the united chloroformic extracts being dried and weighed. Glycerin is determined

by warming the aqueous liquid from the caffeine determination until the chloroform is removed, neutralizing with HCl and determining the glycerin by the method of *Ph. Weekblad*, 71 (1934), 692. Phosphate is determined by taking up the ash from a sample in acidulated water, precipitating with magnesia mixture and finally igniting and weighing as magnesium pyrophosphate. Arsenic is determined by digesting 5 cc. of the tonic, 5 cc. of 30% hydrogen peroxide and 3 cc. of H_2SO_4 in a Kjeldahl flask; adding 35 mg. of hydrazine sulphate, boiling 10 minutes, adding 35 mg. of KBr, cooling, adding 1 cc. CCl_4 and two drops of saturated aqueous iodine solution and titrating with $N/100$ potassium bromate. 1 cc. of $N/100$ potassium bromate is equivalent to 1.37–1.46 mg. of methyl-disodium arsenate, depending upon water of crystallization. Several tests for identity and purity are also given. Analysis of *Tonicum, Roche* is made in similar manner.—H. J. VAN GRIFFEN. *Pharm. Weekblad*, 72 (1935), 191. (E. H. W.)

Tragacanth—Testing of. Rubrics of the Swedish Pharmacopœia, X, concerning tragacanth are reviewed. Statements regarding neutral reaction of the mucilage are incorrect. In his experience, Karsmark has never seen a neutral tragacanth mucilage. The requirement that a blue coloration shall be produced with $N/10$ iodine is seldom fulfilled by the best quality of tragacanth. Correct viscosity is more likely to go with failure to give the iodine color reaction (*i. e.*, absence of starch gains). There is a relation of drug quality and viscosity of the mucilage; the higher the better. Also there is a parallel relationship between opalescence of the mucilage and viscosity.—K. A. KARSMARK. *Farm. Revy*, 34 (1935), 161, 169. (C. S. L.)

Tung Oil—Iodine Value of. As a result of research on the quantitative relations of time, excess of Wijs reagent, and temperature to the iodine value of tung oil, it was found that even after 12 days of contact the iodine value tends to increase. It is proportional to the excess of iodine in centigrams of equivalent iodine per Gm. of oil, instead of being proportional to the percentage excess of Wijs solution, as usually stated. If the ratio of Wijs solution added and weight of sample of oil is kept constant, almost identical iodine values are obtained when temperature and time are the same. When time of contact and excess of iodine are constant, the iodine value increases with increase in temperature. With the same excess of Wijs solution, almost identical iodine values can be obtained at different temperatures by varying time of contact. Standard conditions for converting iodine value are proposed.—K. HO, C. S. WAN and S. H. WEN. *Ind. Eng. Chem., Anal. Ed.*, 7 (1935), 96. (E. G. V.)

Tyrosine—Separation of, from Cystine. A method for the separation of large amounts of tyrosine from cystine has been worked out which permits recovery of 92 to 94% cystine, but which fails if very small amounts of cystine are mixed with very large amounts of tyrosine. The point of isolation of a mixture of cystine and large amounts of tyrosine is at a p_H of 1.72 to 2.0.—F. R. GREENBAUM. *Am. J. Pharm.*, 107 (1935), 162. (R. R. F.)

Umbelliferone—Content of, in Persian Gum Ammoniac. The Persian gum (*Dorema ammoniacum*) was shown to contain umbelliferone by the fluorescence developed upon alkalinizing a hydrochloric acid-alcohol extract of the gum. The fluorescence may be seen in ordinary light, but is intensified in ultraviolet light. These positive findings disprove the literature statements that umbelliferone is not present in this variety.—K. SZÁHLENDER. *Arch. Pharm.*, 273 (1935), 234. (L. L. M.)

Vegetable Oils—Absorption of Ultraviolet Light as Function of Commercial Treatment. Using Chevallier and Dubouloz' spectrophotometric method (*Bull. Soc. Chim. Biol.*, 14 (1932), 1076–1087) on 1% solutions of olive oil in hexane, it was found that virgin or "extra" olive oils have an absorption coefficient ($\log I/I_0$, in which I and I_0 are the intensities for the solution and the solvent, respectively) at 2700 Å. of less than 0.200; higher values indicate either a refined oil or a mixture of refined and virgin oils.—J. GUILLOT. *Ann. Fals.*, 28 (1935), 69–75. (A. P.-C.)

Vitamin A—Determination of, in Oils by the Spectrophotometric Method. While all authors are in accord regarding the selective absorption of vitamin A at 3280 Å., they do not agree as to the method of utilizing this property for the assay of vitamin A in oils. In previous papers Chevallier, *et al.*, have shown the parallelism that exists between the value of absorption and the biological activity of a product. In the present paper they again show that when working with oils with an absorption maximum at 3280 Å. the physical measure corresponds to the biological titer. For highly active fish liver oils in 1°/₀ hexane solution in 1-cm. cell, an intensity of absorption of 3280 Å. = 1 for log 1°/1 was equivalent to 730–750 U. S. P. vitamin A units. For an ordinary common cod liver oil manufactured and preserved under the best conditions, the inten-

sity of absorption of 3280 Å. = 2.7 for log 1°/1 (1°/₀ solution) was equivalent to 2025 U. S. P. units of vitamin A. Examination of a large number of common cod liver oils showed a vitamin A activity varying from 150 to 3000 units. Badly prepared or preserved oils show an absorption spectrum displaced toward the shorter wave-lengths due to the decomposition products of vitamin A. In this case it is not possible to utilize the spectrophotometric method. Several advantages of this method are discussed.—A. CHEVALLIER and P. CHABRE. *Bull. soc. chim. biol.*, 16 (1934), 1451; through *Squibb Abstract Bull.*, 8 (1935), A-485.

Vitamin A—Differential Reactions between Carotene and Oils Rich in. Antimony trichloride, trichloroacetic acid and chloral hydrate each yield with carotene and with halibut liver oil a characteristic blue color. The blue color persists when the reaction mixture containing carotene is heated to 100°, whereas the halibut liver oil mixture changes to purple. Cod liver oil and butter fat yield with trichloroacetic acid and chloral hydrate immediately a purple without heating. A reagent containing sulphuric acid and formaldehyde forms with carotene a purple zone, with halibut liver oil a bright red color is developed in the acid layer and a blue to purple in the chloroform layer. The reagents may also be used to differentiate carotene and vitamin A from ergosterol and cholesterol.—VICTOR E. LEVINE and GEORGE E. BIEN. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 873. (A. E. M.)

Vitamin A—Differentiation of, from Carotene by Means of Antimony Trichloride. Vitamin A and carotene develop a blue color when treated with antimony trichloride in chloroform solution. The color produced by carotene persists after heating to 60° whereas that caused by vitamin A changes into red or violet-red. Pyrocatechin, which was used by some authors for differentiation, is not only needless, but actually inhibits the development of the blue color.—A. C. ANDERSEN and V. E. LEVINE. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 737. (A. E. M.)

White Mineral Oil and Petrolatum—Use of, in Pharmaceutical and Cosmetic Practice. There is very little in the literature about chemical and physical characteristics of these products. Many topics are considered in the present paper: Theory of the origin of crude oil; its occurrence in Asia, Europe and North America; the classification into three general types according to chemical structure—naphthene base crude, paraffin base crude and mixed base crude—and where they are found. The present process for white oil refining was invented by J. Markovnikov, a Russian chemist, about 1887, and in 1895, another Russian, Grigori Tetroff perfected it so that it was commercially useful. The principle of refining processes involves removal of the light fractions and then fractionating the residue, the main object being removal of unsaturated hydrocarbons. These hydrocarbons are unstable, give unrefined oil its odor and taste. The oil is treated with sulphuric acid, washed with alkalies and filtered. Removal of unsaturated hydrocarbons or other impurities is necessary if oil is to be used internally or even for cosmetics, because of possible skin irritation. The U. S. P. test for unsaturates is done with sulphuric acid and is satisfactory except for the vague specification of "pale amber." U. S. P. XI has adopted a definite color standard. The U. S. P. has definite specifications for viscosity and for internal use the viscosity should be high, since it is believed that property lowers tendency to leakage. Cloud point is important because it indicates absence of solid paraffins but opalescence might be due to moisture. Moisture is readily absorbed. The British Phar. directs that the oil be dried by heating to 110° C. and cooling in a desiccator before determining cloud point. Specific gravity has significance. Action on intestinal tract is not simple lubrication but the oil emulsifies with intestinal contents so the higher the specific gravity, the more readily it will emulsify. The U. S. P. lead oxide test for sulphur or sulphur compounds no doubt gives negative results with all oils offered for medicinal purposes. Sources of crudes for white mineral oils are discussed. Uses of the refined oils are emulsions with various gums, nasal sprays, baby oils, ointments and creams. Essential requirements for cosmetic white oils are correct viscosity and preference is for those of naphthene base type. Oils of low viscosity are generally employed for liquid brilliantines, along with a mineral oil which is volatile, like a completely refined kerosene. Mineral oils are used in the so-called sun-tan oils; in vanishing creams to prevent drying out; as softening agents in brushless shaving creams and other softening preparations. Petrolatum is closely related to mineral oil and to paraffin but with important differences. Petroleum may be considered a colloidal system in which the solid wax is the external phase and the oil the internal phase. The liquid would separate from the solid but for the presence of a gel-former called proto-substance. Proto-substance is present in satisfactory quantities in natural petrolatum but is often removed in refining.

Petrolatum is obtained only from paraffin base and mixed base crudes. Purification by "adsorption," contact with porous material like bone-black, etc., is slow and tedious. More rapid methods with strong chemicals sacrifice quality for very light color. Petrolatum used for pharmaceutical and cosmetic preparations should be of *medium* fibre. Long fibre makes sticky or stringy product, short fibres give too thin a body. Melting point need only be high enough to preclude liquefying of the product in summer. Consistency is important and can be determined by an instrument similar to the asphalt penetrometer. U. S. P. petrolatum can be classified into three distinct types: (1) medium melting point and medium consistency; (2) low melting point and soft consistency; (3) high melting point and medium consistency. Those of type No. 1 are the standard ones of commerce, suited for pharmaceutical and cosmetic purposes. Type No. 2 is recommended for resale as petroleum jelly for household use. Type No. 3 is used only where addition of liquids would reduce melting point too much. A fourth type which has high melting point and hard consistency is useful in lip and paste rouges. Selection of correct type of petrolatum should depend upon the purpose. The U. S. P. is recognizing progress in refining of petrolatum by proposed changes in official ointment formulas.—ERICH MEYER. *J. Am. Pharm. Assoc.*, 24 (1935), 319. (Z. M. C.)

TOXICOLOGICAL CHEMISTRY

Apiol—Detection and Determination of, in Viscera. Treat a suitable sample of viscera by the Stas Otto method for poisons; apiol, if present, may be contained in the petrolic ether or in the acid ether extract. Partially evaporate the solvent, add sufficient decinormal silver nitrate (10 cc.) to precipitate any oxalates that may be present, let stand 10 minutes, filter, precipitate the excess silver with concentrated hydrochloric acid (avoiding an excess), filter into a round-bottom evaporating dish, evaporate slowly on the water-bath, add two 2-cc. portions of 1 + 1 nitric acid, evaporate 3 times (with intermediate addition of a few cc. of water), dissolve the residue in 10 cc. of hot water, filter, wash, neutralize with 3 drops of ammonia water, add 1 cc. acetic acid, heat, add calcium chloride solution to complete precipitation, let stand 3 hours on the water-bath, filter, wash, dissolve the precipitate in 5 cc. of boiling 1 + 9 hydrochloric acid, add 5 cc. of 1 + 4 sulphuric acid and titrate hot with decinormal potassium permanganate. The equivalence between the permanganate and apiol should be determined experimentally, as the oxidation with nitric acid does not give 1 molecule of oxalic acid per molecule of apiol.—I. PAYEN. *Ann. Méd. Légale Criminol. Police Sci.*, 15 (1935), 59–61. (A. P.-C.)

Lead Poisoning—Detection of. With the introduction of the Feigl "Tupfelreaktion" reagents, the micro-detection and in many instances the quantitative estimation of many elements has been made possible. One of the best known and most useful of the spot-test procedures is the dithizone method for detecting lead. This has been applied to biological material by J. R. Ross and C. C. Lucas (*Canad. Med. Assoc. J.*, 29 (1933), 649) and W. Lineweh (*Deut. Arch. klin. Med.*, 175 (1933), 157). Their method takes advantage of the fact that a cherry-red color is produced in the lower layer when a lead-containing fluid is shaken with a carbon tetrachloride or chloroform solution of dithizone. By the use of this dye (diphenyl-thiocarbazone) as little as 0.1γ of lead can be detected. Such sensitivity brings the chemical method into the range claimed for the spectrograph, and it is so much easier to apply that it is likely to gain, and for the present to retain, the favor of biochemists concerned with lead estimations.—*Lancet*, 228 (1935), 501. (W. H. H.)

Organic Solvents—Modern. A brief discussion of the difficulties inherent to the identification of organic solvents from the standpoint of toxicology and medico-legal work.—H. ZANGGER. *Ann. Méd. Légale Criminol. Police Sci.*, 15 (1935), 13–20. (A. P.-C.)

Trichloroethylene—Intoxication by. A detailed description of a fatal case of intoxication by trichloroethylene of a workman who had painted a tank with a paint consisting of asphalt dissolved in trichloroethylene. A 20-Gm. portion of the tissues of the corpse was distilled with 60 cc. of alcohol and 5 cc. of 5% alcoholic solution of tartaric acid, and the distillate was refluxed for 1 hour with a 10% alcoholic caustic potash solution free from chlorides; the solution gave a decidedly positive test for chlorides, but no quantitative determination was made.—C. VALLEE and J. LECLERCQ. *Ann. Méd. Légale Criminol. Police Sci.*, 15 (1935), 10–12. (A. P.-C.)

PHARMACOGNOSY

Vegetable Drugs

Drugs and Bugs. In general, drugs with abundance of starch, inulin and sugars are most liable to attack of pests. Some knowledge of harmful insects, their life cycle and habits and some of the means of preventing and combating their ravages is essential. Adult insects have well-developed mouth parts and can be classified into two groups: mouth parts fitted for chewing; mouth parts fitted for sucking. Pharmacists are chiefly interested in the biting ones though the sucking ones cannot be entirely ignored because some young biting ones later develop into sucking insects. The drug store beetle and the square-necked grain beetle are described and drugs which they infest are listed. Control is by fumigating or by heating to 49° C. Carbon disulphide is recommended. The author makes suggestions for detecting them, evidences of and classification of; preventive measures, including sanitation, temperature and moisture; means of extermination, heat for eggs, larvæ and insects and fumigation with carbon tetrachloride or chloroform. Ideal pest exterminators must arrest growth or destroy parasite; be more toxic to pest than host; be adherent and maintain active properties for a period of time; enter into intimate contact with parasites or their elements. To prevent vegetable or mold parasites, drugs should be kept in dry state. The list of drugs given may be kept satisfactorily by the so-called "vacuum method." New supplies are placed in a vacuum chamber for several hours then transferred to air-tight containers.—Ernst T. Stuhr. *J. Am. Pharm. Assoc.*, 24 (1935), 285. (Z. M. C.)

Leonurus Cardiaca. The herb, whole and powdered, is described botanically macro- and microscopically. Chemically, analysis shows volatile matter at 100° C., 6.92%; total ash, 13.64%; petroleum ether extractive, 1.82%; ether extractive, 4.88%; alcohol extractive, 21%; water extractive, 29.90%; volatile oil, 0.05%; and crude fibre, 15.11%. A 2% aqueous acid extract is precipitated by lead acetate, the filtrate is precipitated by basic lead acetate, weakly reduces Fehling's solution, and gives precipitates with the usual alkaloidal reagents. Microsublimation yields a product which reacts slightly with Mayer's or silicotungstic acid reagents. The percentage of alkaloid present (0.05%) is determined by the usual method of extraction using an ammoniacal ether mixture as the initial solvent. The tannin content is tabulated and is determined in the samples by the hide powder method of precipitation and by the method of Schulte. Therapeutically, various workers state its use as a tea for prostate sufferers, climacteric complaints as an expectorant, astringent, sedative, and for its heart action. Pharmacologically, no such actions were obtained on either the dog, rat, mouse or frog. The astringent action is due to the tannin present. The direct color and the color under the fluorescence lamp of extracts prepared using various solvents is tabulated.—W. Peyer and H. Vollmer. *Pharm. Zentralh.*, 76 (1935), 97. (E. V. S.)

PHARMACY

Galenical

Cocoa Butter—Use of, as Excipient in Pills Containing Extracts. Pills containing vegetable extracts can be made as well with cocoa butter alone as with a mixture of this with chocolate. Preparation is described of pills of Sagralin (Pillulæ Frangulæ Compositæ, Ph. Dan., 1933) and of valerian pills under various conditions of mixing and with cocoa butter only. Use of both licorice root powder and yeast powder as excipients is recommended. The disintegration rates of the two sorts of pills are studied by a method of determination of disintegration time which is described. The errors of dosage of hand-made pills are considered. If the pills were carefully made, these errors were found to be under 2% and due chiefly to the weight variations of the pills. The mean deviation from the mean weight of 1800 pills weighed singly to an accuracy of 1 mg. was 2.36%. The pills were also weighed in groups of 100 and the mean percentage deviation from the mean weight so obtained was found to agree well with that observed for the entire group of 1800.—A. T. Dalsgaard. *Dansk Tids. Farm.*, 9 (1935), 73, 97. (C. S. L.)

Homogenizer—Hand Type, and Its Use in Making Emulsions. A small inexpensive instrument has lately appeared on the market and it has been found very convenient and efficient for manufacturing pharmaceutical emulsions on a small scale. The author's conclusions are: (1) The efficiency, versatility and ease of operation of this apparatus are outstanding. (2) It pro-

vides a saving of materials both in the elimination of waste through cracked emulsions and the reduction in the necessary amount of emulsifying agent. (3) An emulsion prepared by its use possesses a high degree of dispersion and a much slower rate of creaming than emulsions prepared by the usual trituration methods.—LINWOOD F. TICE. *Am. J. Pharm.*, 107 (1935), 158. (R. R. F.)

Tolu Coating, U. S. P. X and N. F. V—Value of. A study was made of tolu-coated pills to determine percentage of disintegration in the body. Pills containing methylene blue and barium sulphate were made. The barium sulphate was used so that the X-ray could be used to locate the position of the pills in the digestive tract and the methylene blue by its property of coloring the urine made possible the determination of disintegration where X-ray was not used and in determining entirety of coat. Coated pills were placed in water to see if the coating was perfect, leakage of methylene blue showing any opening. Microscopic examination indicated that the coating was about 0.1 mm. thick, no thicker than necessary to protect the pill. Tiny depressions did not take as heavy a coat as smoother surfaces. The authors believe that if the coating were absolutely uniform the pills would be as impervious to water or digestive fluids as lead shot. Old tolu was better than fresher because it had lost most of its volatile oil and there was greater disintegration of pills coated with it. Four different samples were used and all coatings were tested in two ways. Color of urine was observed for sixty hours. When the X-ray was used, the subject was given six pills. Radiographs were taken at intervals, a small teaspoonful of Bari-o-meal being given before the first. Each series of tests is reported in considerable detail, number of subjects, disintegration time, etc. Altogether 286 pills were given; 112 subjects were used; 102 pills disintegrated. The percentage of disintegration was 35.66, most of it taking place in the colon, probably too late for proper absorption. It is recommended that gelatin coating be substituted for tolu coating in the forthcoming revisions of the Pharmacopœia.—F. S. BUKEY and MARJORIE BREW. *J. Am. Pharm. Assoc.*, 24 (1935), 291. (Z. M. C.)

PHARMACOPŒIAS AND FORMULARIES

British Pharmacopœia—Revision Notes on. The article consists of a critical review of the following products of the British Pharmacopœia: Acidum Hydrocyanicum Dilutum, Amylum; Carbonei Dioxidum; Eucalyptol; Liquor Ammoniæ Fortis; Liquor Hydrogenii Peroxidi; Liquor Plumbi Subacetatis Fortis; Oleum Eucalypti; Glycyrrhiza; Quassia; and Prunis Serotina.—J. HENDRY and P. A. BERRY. *Australasian J. Pharm.*, 16 (1935), 37. (T. G. W.)

Swiss Pharmacopœia—Practical Questions on. It was decided at the convention at Baden to publish the work of the Zürcher Commission on Pharmacopœial Questions in the *Schweiz. Apoth. Ztg.* Information is given about 57 articles official in the Swiss Phar., stating, in some cases, changes which will be made in the new edition of the same. There follows a description of specialties, endorsed by the Schweiz. Apoth.-Verein, which have been taken into the new pharmacopœia. Because of the numerous changes in the new pharmacopœia, the commission recommends that all formulæ and prescriptions specify whether the ingredients should be those of the 4th or the 5th edition. Reference is made to a table in the new edition which shows the differences in the preparations. The Pharm. Helv. V becomes official May 1, 1936.—*Schweiz. Apoth. Ztg.*, 73 (1935), 165. (M. F. W. D.)

NON-OFFICIAL FORMULÆ

Manicure Preparations—Modern. The article consists of a number of formulas for manicure preparations which could be made by the pharmacist. The formulas listed consist of cuticle removers, nail bleaches, nail polishes, nail white and cuticle cream.—*Chem. and Drug.*, 122 (1935), 357. (T. G. W.)

Nail Polishes and Enamels. The preparation of nail polishes is carried out in the sifting and mixing machines. The different ingredients are weighed out in their respective proportions, and simply thoroughly mixed and sifted. Ordinary putty powder, or oxide of tin is the principal constituent. To this are added the usual powder materials—chalks, pumice powder, kaolin, osmo-kaolin and zinc oxide. The tinting of the mass is done by adding a small proportion of selected dye. Eosine, Bengal-red and various organic dye materials are used. The coloring matter is added to one constituent, and the latter is then incorporated with the others. When liquid polishes are used, purely chemical preparations have been substituted. The more cus-

tomary practice is to suspend the ordinary polishing powder in selected gums and glycerine. The suspension must be perfect, and permit of the liquid being filtered so that the product for the market is represented by a comparatively clear solution. Tragacanth, starch and similar agents are used. *Nail Enamels.*—A well-made enamel confers a bright, lustrous and yet natural appearance. Solvents and plasticizers represent the principal components. Nitro-cellulose is used to produce the best enamels. The enamels at present on the market are chiefly those of nitro-cellulose, celluloid, and benzoin. The preparation used by photographers which consists of celluloid obtained from scrap sources and dissolved in amyl acetate is widely employed. It consists of cutting up the scrap and charging into a comparatively large mixing pan. Amyl acetate and acetone are poured into the pan, and heat gently applied. The consistency of the product can be varied by the amount of scrap added, and it should be reduced to a syrupy condition. Some selected perfume is then added in the usual manner, and the charge emptied. Larger manufacturing perfumers employ ester gum and other addition agents to improve the lustre. Selected benzoates, glycols, oxalates, tartrates and camphor are used as plasticizers. The plasticizer used should, where possible, possess a comparatively high boiling point whereby the solvents of the cellulose are thus given the opportunity to evaporate, and leave the enamel in the desired condition. The plant used for systematic production consists of a small specially constructed boiler, in which the ingredients are added. Air is excluded, and the temperature raised by steam heat with the greatest accuracy. When all material has passed into solution the odor of the product is noted. Some of the organic solvents such as the acetones and acetates possess a strong odor, and it would take much perfume to overcome it. Methods such as those employed by deodorizers of oils consist of passing air or even coal gas through the mass, but criticism arose over the possibility of unexpected and uncontrolled reactions occurring. For this reason the work was modified to simply mixing the solvent and plasticizer, raising to the desired temperature, cooling, and adding the selected perfume. It is a good plan to allow the preparation to rest for some time in the air-tight vessel before adding the perfume. The final additions are the perfume and the dye.—A. G. Arend. *Perf. and Ess. Oil Rec.*, 26 (1935), 122. (A. C. Dbd.)

Violet Perfumes. A discussion of violet perfumes dealing with the cultivation of the flower, odor, violet leaf, the use of ionone, blenders, aging and soap perfumery is given.—H. Silman. *Perf. and Ess. Oil Rec.*, 26 (1935), 119. (A. C. Dbd.)

Cherry Gum—Emulsifying and Coating Properties of. The author states that cherry gum is slightly soluble in water, most of it swells in water without going into solution. Because of this property of cherry gum, a proper emulsion cannot be obtained. Under these circumstances, cherry gum cannot be used as a suitable substitute for gum arabic in the preparation of emulsions. —N. P. Kalaschmikow. *Sowjet-Pharmaz.*, 5, Nr. 4 (1934), 35–35, Pharmakol. Abt. Leningrad. wiss. prakt. Pharmaz. inst.; through *Chem. Zentr.*, 106 (1935), 925. (G. B.)

Galenical Preparations—Investigation on. III. Fowler's Solution. This preparation has undergone numerous changes in formula and preparation since its introduction in 1786. The Swiss Phar. V directs a solution to be made of 1 part arsenous acid and 1 part potassium bicarbonate in 2 parts water, then dilute with 50 parts water and neutralize to litmus paper by the addition of about 9.5 cc. *N* hydrochloric acid, after which the preparation is completed. This amount of hydrochloric acid is just equivalent to the potassium bicarbonate. Since arsenous acid does not redden blue litmus, it plays no rôle in the neutralization. It may be concluded that the preparation so made contains no potassium arsenite and is a solution of arsenous acid and potassium chloride. Considering this fact, the title of the preparation is false. If instead of 1.0 Gm. arsenous acid, 1.476 Gm. potassium metaarsenite ($KAsO_2$) is used and the solution neutralized to litmus with hydrochloric acid, the resulting solution is exactly identical with that of the Swiss Phar. and is most rapidly and easily prepared. A correct title for the preparation would be "Sol. Acidi arsenicosi cum Kalio chlorato."—L. Rosenthaler. *Scientia Pharm.*, 6 (1935), 41. (M. F. W. D.)

Glycerinum Thymolis Rubrum, A. P. F.—Notes on Coloring of. The coloring materials used in this preparation have not been satisfactory. The preparation formerly contained 20 minums each of Solution of Carmine and Tincture of Cudbear, and in 1934, 40 minums of each were directed in order to delay a noticeable fading of the color. The author attempted to determine which of the two coloring agents was at fault and to find an alternative coloring matter which would prove more permanent. Solution of Carmine was found to be more stable than the Tinc-

ture of Cudbear, and is moderately satisfactory if the preparation is stored in a dark place. Amaranth 184, in the form of Liquor Ruber, A. P. F., 80 minums in 20 fluidounces, forms a satisfactory coloring agent and can be stored under ordinary light conditions without decomposition.—E. E. NYE. *Australasian J. Pharm.*, 16 (1935), 41. (T. G. W.)

PHARMACEUTICAL HISTORY

Revolutionary Account Book of Christopher, Jr., and Charles Marshall. The Marshall Drug Store, a prominent colonial pharmacy, was founded in 1729 by Christopher Marshall, Sr., a "fighting Quaker." The sons succeeded to the business and Charles, apothecary, botanist and chemist, attained a fine reputation for integrity and skill. In his old age he became the first president of the Philadelphia College of Pharmacy. In the archives of the College is the book described in the article. It is a typical "Day Book" of 32 leaves. The upper part of the cover is shown and several facsimile pages. Entries show miscellaneous character of the business. Though major business was in drugs and medicines there was extensive trade in paints, oils and glass. Prices are in pounds, shillings, pence. Spelling is poor. Dr. Abraham Chovet's name appears frequently as does Dr. John Morgan's; Christopher Sower, a Germantown printer who published the first Bible in America was a customer Some interesting items are discussed as well as prices of substances that are still in use.—CHARLES H. LA WALL and MILLICENT R. LA WALL. *J. Am. Pharm. Assoc.*, 24 (1935), 302. (Z. M. C.)

PHARMACEUTICAL EDUCATION

Botany Course—Value of, as a Foundation for the Pharmacognosy of Stem and Bark Drugs. It is necessary to distinguish between aerial stems and underground stems. The following features need emphasis: Location of growing point, manner of branching, origin of branches, buds and leaf scars, functions of each, internal or microscopic structure of each. The outstanding characteristics of the four types of underground stems, rhizomes, corms, bulbs and tubers should be pointed out. Leaf scars and bud scales on upper surface of rhizomes should be pointed out. For bulbs, onion or garlic or squill may be used. Outer papery membrane, fleshy scale enclosing buds and roots should be emphasized. The corm does not consist of thick fleshy scales but is solid and more flattened from top to bottom. The Irish potato is an excellent example of a tuber. Buds should be examined, as well as outer corky layer and rows of vascular bundles internally. Microscopic structure is more important than gross anatomy. A knowledge of tissues present in entire stem enables the student to understand functions. Structure, too, can be used to distinguish between types of stems, monocot, dicot and fern. Comparisons should be thorough in order that the student will comprehend meaning of all the terms encountered in the official description of the structure of drugs derived from the stem of a plant. Types of vascular bundles need detailed study. The change in vascular bundles taking place in stems which undergo secondary growth can be shown with *Menispermum Canadense; Cascara Sagrada* in transverse section is excellent for detailed study of a bark.—C. C. ALBERS. *J. Am. Pharm. Assoc.*, 24 (1935), 310. (Z. M. C.)

Chemistry—How Should Fundamental Courses in, Be Taught in a College of Pharmacy. How these courses are presented and the training of the individuals who present them are of paramount importance. Important applications of organic chemistry should be stressed somewhere in the pharmacy course but the three hours a week of classroom work devoted to organic chemistry is hardly enough for adequate foundation for specialized courses. Practical application would diversify but would result in weakness rather than strength. Interrelationships must be established in order to coördinate organic and inorganic courses. If principles of hydrolysis are taught, they only need to be reviewed when studying solution of aluminum subacetate of the National Formulary. Also in the preparation of syrup of calcium iodide, iron is oxidized to its higher valence before precipitation with calcium carbonate because study of solubility products of ferrous carbonate and ferric hydroxide show that the syrup will contain less iron if removed after oxidation. Evolution of carbon dioxide may be pointed to as evidence of hydrolysis of ferric carbonate and a reason why the precipitation takes place as rapidly and completely as it does in spite of the little difference in solubility products of calcium carbonate and ferric hydroxide. There is fundamental chemistry in the preparation of this syrup but it is not essential that it be mentioned when hydrolysis, oxidation and solubility products are discussed in general chemistry. It seems more

essential that teachers of professional and technical courses have a profound knowledge of fundamentals upon which their specialties rest than that teachers of fundamental subjects have in mind all the important and useful applications of their subject. Good teaching requires that a course be interesting so *judicious* use of applications is permissible but this does not change the general principle.—ERNEST LITTLE. *J. Am. Pharm. Assoc.*, 24 (1935), 307. (Z. M. C.)

Homeopathic Pharmacy—Basic Demands of. The author stresses the need of physiological and pharmacological studies and assays for homeopathic medicines.—H. NEUGEBAUER. *Pharm. Zentralh.*, 76 (1935), 192. (E. V. S.)

Homeopathy. Homeopathic practice seems to be rather widely developed in Germany. In the *Süddeutsch. Apoth.-Ztg.* (Feb. 22, 1935) is the report that 400 pharmacists of southern Germany took a course in homeopathy given by E. Bamann. The general outline of the course and its divisions such as "Development of Homeopathy," "Technique of Preparing Dilutions," etc., are described and briefly commented upon.—E. K. *Schweiz. Apoth. Ztg.*, 73 (1935), 172. (M. F. W. D.)

Teachers and State Board Examiners—Problems of the. Scope of practical pharmacy and dispensing has become more complicated because of the limited amount of practical drug store experience that candidates for registration have and because of the large number of new preparations put on the market for all to learn about. It is necessary for teachers to supply training that once was obtained in drug stores. Teaching processes and procedures of the U. S. P. and N. F. is not a burden but with hundreds of others and combinations of them added it seems possible to teach no more than basic principles underlying the art of compounding and dispensing. Examiners are confronted with difficult problems like the number and type of prescriptions to be given to an applicant, the number of times an applicant may fill a prescription and how it should be graded. If examiners and teachers were to coöperate, plans might be made for more uniform examinations. Since comprehensive examinations are best, the larger the number of preparations the better. It is suggested that 60% consist of U. S. P. and N. F. preparations with directions given and the remaining 40% prescriptions without directions. Reading original prescriptions is seldom considered but it might be made a part of the test to determine whether the candidate can handle the prescription from the time he receives it until it is turned over to the customer.—HARRY W. MANTZ. *J. Am. Pharm. Assoc.*, 24 (1935), 296. (Z. M. C.)

MISCELLANEOUS

Homeopathic Pharmacy in 1934. A review of the work accomplished in homeopathic pharmacy in 1934.—H. NEUGEBAUER. *Pharm. Zentralh.*, 76 (1935), 212. (E. V. S.)

Profit—The Way Out of the Depression. To protect the public, prices must be at a level that allows adequate pharmaceutical service. A code of fair competition must be a guide for ninety per cent of the stores. Laws of the States demand that highly skilled persons sell drugs and if there is only one employee that one must be a registered pharmacist. In small retail stores minimum code wage is not apt to be maximum drug store wage. *All* fair trade provisions will control selling power of all items controlled by the code. The public must pay the cost of handling all items. This fundamental importance is shown by specific figures. If recovery is to come to 90 per cent of the retailers under the National Industrial Recovery Administration, sales must represent cost of merchandise, overhead and net profit. If sales do not pay cost of merchandise and overhead, bankruptcy will result and lack of adequate drug service will become a consumers' problem. A sale without profit is without honor under any code. Without profitable sale, there is no means to pay employee, no purchasing power.—W. BRUCE PHILIP. *J. Am. Pharm. Assoc.*, 24 (1935), 298. (Z. M. C.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Bile Salts—Influence of, on the Nervous System Following Intraspinal Usage. Sodium desoxycholate can be introduced in minute doses intraspinally in cats without injury to the cord. Larger doses produce motor and sensory disturbances and death from respiratory paralysis. Traumatized spinal tissue is highly susceptible to even minute doses of bile salts in alcoholic solution though resistant to the same dose in aqueous solution. Spinal fluid protein and cord tissue

reduce the hemolytic action of bile salts.—S. S. LICHTMAN and E. L. STERN. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1201. (A. E. M.)

Calcium Compounds—Comparative Study of the Absorbability of. Reference is made to two preliminary reports which were concerned with dicalcium phosphate, calcium chloride, lactate, glycerophosphate, gluconate, hexacalcium inosite hexaphosphate and calcium lacto-phosphogluconate. The present paper deals with the first six. The literature was reviewed in previous reports. The technique is "based on the antagonism between magnesium and calcium, earlier experiments having shown that animals narcotized by magnesium are awakened by injections of calcium salts, and conversely, animals which have absorbed increasing quantities of calcium require greater amounts of magnesium for narcosis." Details of procedure are given and results are tabulated. Arranged according to maximum amount absorbed they appear in following order: lactate, gluconate, chloride, hexacalcium inosite hexaphosphate and dicalcium phosphate (the same), and lastly calcium glycerophosphate. There is a constant rise until the fourth hour when the maximum is reached for all except the chloride which requires five hours. That calcium lactate heads the list agrees with the findings of McGowan and Bergheim. The lactic acid radical has a significant influence; Rowe and Kahn have shown that alkaline secretions have an inhibitory influence on the rate of calcium absorption. The authors believe it is reasonable to assume that calcium lactate may be the best calcium compound for oral administration in human subjects as it was in the albino mice used as test animals in these investigations.—A. RICHARD BLISS, JR., and ROBERT W. MORRISON. *J. Am. Pharm. Assoc.*, 24 (1935), 280. (Z. M. C.)

Candicine—Contributions to Pharmacology of. Intraperitoneal injection of 6 mg. of candicine iodide/100 Gm. in adult white rats, produced death from respiratory paralysis; 5 mg./100 Gm. killed 60% of the rats. The rats showed muscular incoördination, trembling and sometimes violent convulsions. In dogs, an intravenous dose of 2–6 mg./Kg. suppressed the cardioregulator effect of the vagus; 6 mg./Kg. suppressed the effect of the sciatic nerve; 4–6 mg./Kg. suppressed the vascular effect of nicotine and the pressor but not the hypotensor or muscarine effect of tetramethylammonium iodide. In sympathectomized dogs, candicine produced a lesser hypertension than in normal dogs, due in part to a discharge of adrenaline and in part to a peripheral vascular effect since it persisted, though somewhat diminished, after suprarenalectomy.—F. P. LUDUENA. *Compt. rend. soc. biol.*, 118 (1935), 593; through *Squibb Abstract Bull.*, 8 (1935), A-499.

Carbon Tetrachloride—Experimental Investigation on Its Toxic Action by Repeated Inhalation. Exposition of a few minutes in an atmosphere containing carbon tetrachloride is sufficient to produce subacute inflammatory lesions of the liver and kidneys, provided exposition is repeated and that the atmosphere is sufficiently rich in carbon tetrachloride. The hepatic lesions seem to be more important than the renal, which is characteristic of carbon tetrachloride irrespective of its mode of administration. The lesions are in all respects comparable with those observed following upon the introduction into the organism of small doses of toxic substances. The hepatic lesions, in particular, are constituted by a reactional process of periportal fibrosis; it is a parenchymatous disturbance that is entirely different from that observed in the case of massive intoxication through the digestive tract.—P. LANDE and P. DERVILLE. *Ann. Méd. Legale Criminol. Police Sci.*, 15 (1935), 25–27. (A. P.-C.)

Daphnia—Propagation of, for Experimental Use. The propagation of *Daphnia Magna* for laboratory experiments is assured by extremely simple methods, merely adding certain animal or plant products, commonly available, without special preparation, to water (tap or distilled), suitable for drinking purposes (practically free of chlorine and heavy metals), alkalinized with an excess of calcium carbonate (coarsely crushed marble stone), or precipitated chalk, preferably aerated and kept at room temperature (21° C.) in the diffuse light of northern exposure. The cultivation of consecutive generations of suitable experimental animals (females developing parthenogenetically summer eggs) may be assured with any of the common natural manures of animal excretions, provided (1) the amounts given at one time are not excessive, as otherwise putrefaction may occur; (2) the applications are frequent enough to prevent starvation; (3) the accumulation of toxic substances is prevented through fairly frequent (monthly or bi-monthly) renewal of cultures and artificial aeration, if necessary; (4) a sufficient number of vigorous animals is used to start the daphnia culture. The following food substances were found satisfactory: Dried, shredded sheep manure and dried shredded cow manure, dried and malted milk and dried pig

blood. Plant products, such as cotton-seed meal and soy bean flour were also found satisfactory, both particularly advantageous with the addition of 0.003% urea. Certain micro-organisms, such as infusoria, algæ, bacteria and yeast also prove of value. The host of enemies, which may destroy daphnia, can be rather readily kept out of cultures or, if found present, usually quickly removed. Careful attention to the details of propagation which are given at great length, assures unexcelled uniformity in age, size and vitality of the daphnia. Over 1000 may be obtained in one month, starting with six animals.—*Am. J. Pharm.*, 107 (1935), 103. (R. R. F.)

Digitalis—Studies on the Bioassay of. II. New Leg-Vein and Intramuscular Guinea Pig Methods. Investigation of the value of the guinea pig in the assay of digitalis has had further study. New leg-vein and intramuscular minimum lethal dose methods with simplified technique have been devised and checked against older methods. Relative occurrence of cardiac and respiratory failure was investigated because of the question of primary cause of death. Detailed methods are given, experimental procedure is described, and a typical protocol of the course of events in the new leg-vein method is given. The symptoms described are identical with those of the subcutaneous and new intramuscular methods, except that they appear a little earlier. One table of typical results indicates that respiratory failure is the primary cause of death. Another table is a summary of minimum lethal and minimum systolic standstill doses obtained on four tinctures by guinea-pig and frog methods. Analysis of the latter table shows that the minimum lethal dose in the leg-vein method is smaller than that in the subcutaneous method. Since heart beats could be felt through chest wall for some time after respiration had ceased the author questions the soundness of Richaud's conclusion that respiratory failure makes the guinea pig valueless as an assay animal for digitalis, which is mainly used for its effect on the heart. Dale and Burn have emphasized that a test does not have to be identical with therapeutic effect so long as it measures the active principle. The subcutaneous, new leg-vein and new intramuscular guinea-pig methods have the advantage that anesthesia is unnecessary, artificial respiration is not employed, and operative procedure is less severe. All three guinea-pig methods give good results but time and technique affect preference.—JAMES H. DEFANDORF. *J. Am. Pharm. Assoc.*, 24 (1935), 276. (Z. M. C.)

Digitalis—U. S. P. Standards for. The U. S. P. X standard and the standards of some other pharmacopœias are stated. The present standard for U. S. P. digitalis is about four-fifths that of the International Standard and there are serious objections to maintaining it. It furnishes a market for digitalis that does not meet requirements of the European markets. Standards must be attainable and if the International Standard is adopted for U. S. P. XI they can be easily met. The author has produced a dried leaf of twice the activity of the U. S. P. standard and to adopt the International Standard means raising the present standard 25 to 30%. If that were done, tincture of digitalis, U. S. P. XI would be equal in strength to that official in many leading European countries. The value of a standard powder in bringing together the results of different workers has been emphasized previously. There is no unanimity on the question of biological testing of digitalis. It is well known that tincture of digitalis tested on frogs at intervals of three months or more will show much greater loss in strength than when tested at similar intervals on cats. This has been demonstrated by Wokes. Foster and Van Dyke who studied the effect of aging found losses by both assay methods but much greater in the frog method. The cat method has the advantage also that it affords a means of calculating the physiological dose for a patient. Adoption of the International Standard for digitalis in U. S. P. XI and the recognition of 100 mg. of this powder as an International Unit, using cats as test animals, would provide physicians with products whose dose would be easily calculated by the method of Eggleston. A national Standard Digitalis Powder for the United States should be prepared from mixed powdered leaves from different sources, and it would not be necessary to adjust to the International Standard but simply to determine the ratio between the potencies of the two standard powders. Adoption of the International Standard would simply require a definition for the unit of digitalis as the "amount of activity contained in 0.1 Gm. of the International Standard Digitalis Powder, so that 1 Gm. of the International Standard represents 10 units."—F. A. UPSHER SMITH. *J. Am. Pharm. Assoc.*, 24 (1935), 272. (Z. M. C.)

1-2-4 Dinitrophenol—Blood Sugar Changes after. Dinitrophenol causes hyperglucemia in dogs when injected subcutaneously. It also increases the rate at which glucose is removed from

the blood after quantities of the latter have been given intravenously.—W. F. ASHE, JR. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1062. (A. E. M.)

1-2-4 Dinitrophenol—Effect of, on Oxygen Uptake of Rat Tissue. Neither treatment of the animals with dinitrophenols while still alive, nor action of the substance on the tissue in Ringer's solution caused a definite change in the oxygen uptake.—EDWARD MUNTWYLER. *Proc. Soc. Exptl. Biol. Méd.*, 32 (1935), 1060. (A. E. M.)

2-4 Dinitrophenol—Effects of, on Respiration of Commercial Cake Yeast. Dinitrophenol at a given concentration will either stimulate or inhibit the respiration of yeast depending on the p_H level. Only the undissociated form is of influence.—J. FIELD, 2ND., A. W. MARTIN and S. M. FIELD. *Proc. Soc. Exptl. Biol. Méd.*, 32 (1935), 1043. (A. E. M.)

Insulin—Blood Sugar Curves in Normal and Diabetic Dogs after Intravenous Injections of. The minimum of blood sugar in the normal dog is reached after 20–30 minutes. Return to normal follows within 90 minutes. Doses of 0.3 units per Kg. cause in the diabetic dog decreases from 40–80% lasting one hour or more, with prolonged time of return to normal. The development of diabetic conditions could be shown already 18 hours after pancreasectomy, but the final curve was obtained only after 138 hours.—B. N. BERG, J. GROSS, J. MCAFEE and T. F. ZUCKER. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1080. (A. E. M.)

Insulin, Irradiated—Stimulation of the Adrenal Medulla by. Insulin irradiated with X-rays has no influence on the blood sugar. It causes, however, a pronounced decrease in blood amino acids in normal animals. This effect does not appear, when the adrenal medulla is destroyed.—J. MURRAY LUCK and GORDON M. RICHMOND. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1056. (A. E. M.)

Oysters—Food Value and Anti-Anemic Power of. Comparative blood tests were carried out on dogs that were fed on diets with and without oysters, respectively. The results consistently confirmed Pease's results on the anti-anemic value of oysters.—LÉON BINET and V. STRUMZA. *Paris-Médical*, 23 (1933), No. 26, 28; through *Bull. Soc. Sci. Hyg. Aliment.*, 23 (1935), 53. (A. P.-C.)

Quinine—Effect of, on Circulatory System. The injection of 2 mg. quinine ethanesulphonate in 2 cc. physiologic sodium chloride solution into the femoral artery of the paw of a dog anesthetized with chloralose, bivagotomized at the neck and submitted to artificial respiration, increased the rate of blood flow approximately 5-fold. This vasodilation lasted a rather long time, since 2 minutes after the beginning of the action of quinine the rate of blood flow was still about twice as fast as before injection.—RAYMOND-HAMET. *Compt. rend. soc. biol.*, 118 (1935), 231; through *Squibb Abstract Bull.*, 8 (1935), A-551.

Sodium Bromide—Experimental Study of Toxicity of, in Intravenous Injection. From experiments on rabbits and clinical observations it is concluded that the toxicity of sodium bromide is relatively small; while the dose that can be supported safely is variable, it would seem that with a dose of less than 1 Gm. per Kg. body weight (in rabbits) there is no danger of accidents. Sodium bromide has a marked anesthetic action, but insufficient to permit of serious operations; it must be completed by a general anesthesia, which is, however, rendered easier and free from danger. High blood pressure or kidney troubles may in some cases contraindicate the use of sodium bromide.—A. PATOIR and G. PATOIR. *Ann. Méd. Légale Criminol. Police Sci.*, 15 (1935), 53–58. (A. P.-C.)

Vitamin E—Vestibular Function Test for, Deficiency in the Rat. The vestibular test consists in at least 3 successive observations of nystagmus duration, the direction of rotation being reversed after each observation. The durations of nystagmus following clockwise rotations are averaged, and similarly the durations following counter-clockwise rotations. The mean of these two averages is taken as a result of the test. Normal animals give a nystagmus duration of 7–10 seconds during the period of rapid growth, diminishing to 5–8 seconds after maturity. Vitamin B deficient animals show a progressive increase in the duration of nystagmus following the standardized rotation which becomes significant in the third week and reaches a value of 12–16 seconds before the appearance of any other neurologic symptom.—C. F. CHURCH. U. S. P. Pharmacopœial Conference, Committee on Vitamin B_1 Standardization, Bulletin 7 (3/12/35), 35; through *Squibb Abstract Bull.*, 8 (1935), A-520.

Toxicology

Cinchophen—Peptic Ulcers Produced by Feeding, to Mammals Other Than the Dog. Cats are very susceptible to cinchophen, guinea pigs moderately and rabbits very resistant.—S. O. Schwartz and J. P. Simonds. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1133. (A. E. M.)

Poisonings—Common, in General Practice. The author reviews cases of poisoning common in general practice including methods of treatment and the symptoms. Specifically he includes poisoning from carbon monoxide, bromides, iodides, arsenic, mercury, barbituric acid compounds, amidopyrine, dinitrophenol, cinchophen, phenolphthalein, lead and benzene in industrial poisoning, and poisoning from cosmetics and dyes.—V. F. Stock. *Bull. Acad. Med. Toronto*, 8 (1935), 126; through *Squibb Abstract Bull.*, 8 (1935), A-549.

Tartar Emetic—Effects of, on the Leukocyte Count. Following intravenous inoculation with 1% solution of potassium antimonyl tartrate, the leukocyte count was reduced in 6 of 9 patients who exhibited leukocytoses of abnormal cells.—S. P. Lucia. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1109. (A. E. M.)

Therapeutics

Amebiasis—Observation on Antigens for Complement Fixation in. The mucoid material from the infected intestine of dogs is extracted with absolute alcohol (7 parts) at 45° for 15 days. The filtered solution is diluted with 3 to 5 parts of normal saline and tested for hemolytic, anticomplementary and antigenic properties. It is as active as extracts prepared from cultures of *E. histolytica*.—Chas. F. Craig and L. C. Scott. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 958. (A. E. M.)

Calcium—Relation of, to Blood Formation. The presence of calcium in the diet deficient in certain other organic elements both cures and prevents the development of the expected polycythemia and concomitant chronic anemia.—James M. Orten, Arthur H. Smith and Lafayette B. Mendel. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1093. (A. E. M.)

Diphtheria—Hyperglucemia in. Carbohydrate Metabolism and Treatment with Dextrose-Insulin. The deviation of glucemia during diphtheria can be either way and is generally of little significance. The glucose tolerance, however, shows frequently a disturbance especially in severe cases. The disturbance is of hepatic origin. Insulin is of no value.—Isaac Natin and Cornelia Da Rin. *Semana méd. (Buenos Aires)*, 42 (1935), 1055. (A. E. M.)

Drugs—Dynamic Action of. The author discusses the action of drugs in different dilutions and classifies the different types of symptoms involved in the prescribing of remedies.—Thomas M. Stewart. *J. Am. Inst. Homeop.*, 28 (1935), 208; through *Squibb Abstract Bull.*, 8 (1935), A-535.

Drugs—Rationale of New Uses for Some Old. Considering some of the old drugs for which more extended uses have been found, attention may be directed to carbon dioxide. The therapeutic applications of the respiratory functions of carbon dioxide are many and varied. When the depressed respiratory center requires stronger stimulation, in cases of narcotic poisoning, carbon dioxide is beneficial. It is used in the early stages of anesthesia to increase the respiratory excursion and to stimulate the absorption of the anesthetic; and after anesthesia to increase the depth of breathing. Carbon dioxide has been used in cases of asthma and hay fever, in which it is suggested that the increased hydrogen-ion concentration of the blood reduces the sensitivity of the tissues to anaphylactic stimulants. Frequently the virtue of a drug depends on some physical phenomenon, such as its osmotic tension in solution. The purgative effects of magnesium sulphate depend on this fact. Another physical property, that of adsorption, is responsible for a restoration to popularity of certain drugs. The virtue of kaolin depends on the large surface exposed by a quantity of the drug in a colloidal state of fineness, by means of which it adsorbs bacteria and toxins, alkaloids, putrefactive amines, ptomains, etc., thus delaying or preventing absorption from the bowel. A more recent application of its adsorbent qualities is to employ it by insufflation to nose and throat for removing bacteria in diphtheria carriers. Recent research has indicated a new use for copper in the form of the sulphate or other ionizable salt. Sachs regards copper as a biological catalyst for the utilization of iron in the synthesis of hemoglobin. Many other instances of new uses for old drugs are given in the article.—B. L. Stanton. *Australasian J. Pharm.*, 16 (1935), 174. (T. G. W.)