PHARMACEUTICAL ABSTRACTS

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CONTENTS

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

THERAPEUTICS (*Continued*)

Provitamin A Ointment. In view of reported findings in 25 uncontrolled cases in which provitamin A ointment was used, sterile ointment containing carotene equivalent to 2000 units of vitamin A activity per Gm. in cacao butter and petrolatum, is recommended in the local treatment of burns, wounds and ulcers. Such an ointment is non-toxic, but is obviously contraindicated for ulcerations of tubercular or syphilitic conditions or of a malignant nature.—WILLIAM B. BAKER and HAROLD A. VONACHEN. *Ind. Med.*, 6 (1937), 584; through *Squibb Abstr. Bull.*, 11 (1938), A-135. (F. J. S.)

Quinidine Sulfate—Use of, Intravenously in Ventricular Tachycardia. Twenty-six cases of ventricular tachycardia were observed in which nine were in a profound degree of shock. These nine received intravenous injections of 50–60 gr. of quinidine sulfate dissolved in 500 cc. of 5% glucose solution. Treated since 1930, six of these patients have remained alive while of the remaining seventeen, not treated with quinidine, only one lived longer than 15 days after the attack. It is suggested that intravenous administration of quinidine sulfate be restricted to cases of ventricular tachycardia in which shock and vomiting preclude oral administration.—JOHN HEPBURN and H. E. RYKERT. *Am. Heart J.*, 14 (1937), 620; through *Squibb Abstr. Bull.*, 11 (1938), A-175. (F. J. S.)

Salves—Skin, Contributions to the Chemical Study of, and Their Percutaneous Absorption. Variations in p_H were studied colorimetrically in salves kept two hours at 37° in contact with phosphate buffer solution. No variations were showed by boric-zinc salve, lanolin paste or boric-vaseline. Sweet almond, iodoform and potassium iodide salves tended to become more acid, while tar paste and Kaposis soap salve tended to become more alkaline. Lecithin-vaseline was better absorbed than lanolin-vaseline by rabbit and guinea-pig skin. Lecithin-vaseline accelerated hair growth; this effect was attributed by N. to the action of choline.—TAKASHI NARUSE. *Japan J. Dermatol. Urol.*, 41 (1937), 170; through *Squibb Abstr. Bull.*, 11 (1938), A-205. (F. J. S.)

Sodium Evipan Anesthesia. The authors have used evipan anesthesia as a simple administration in two hundred sixty-six operations, and as a prolonged anesthesia with saline and glucose in one hundred seventy-six. No case gave cause for anxiety, and they regard the method as safe in competent hands. They state that its chief advantages are: (1) it produces pleasanter, smoother and more rapid induction than any inhalation anesthetic; (2) the recovery is pleasant for the patient, and there is a complete absence of post-anesthetic complications; (3) it is easily administered, and repeated administration does not appear to have any ill effects; (4) it gives a relatively bloodless operation field; and (5) its cost compares favorably with that of other anesthetics. Its main disadvantage is that relaxation is insufficient for major laparotomies by midline incisions. In some cases the skin is slightly sensitive even when anesthesia of the deeper layers is adequate.—A. LONG and J. A. MAXWELL. *J. roy. nav. med. Serv.* (July 1937), 194; through *Brit. Med. J.*, 4006 (1937), 782B. (W. H. H.)

Sodium Evipan Anesthesia. The author reports from a Danish hospital his experiences since the spring of 1935 with sodium evipan narcosis induced in four hundred and fifty patients for every variety of operation from dental extractions to the most extensive laparotomies. In about twenty cases the narcosis was more or less imperfect, and in most of them ether was resorted to for the completion of the operation. In eighteen cases ethyl chloride was used at the end of evipan narcosis, which was thus prolonged for some five to ten minutes with no ill effects. Post-narcotic excitation occurred in about one per cent, and necessitated the administration of large doses of morphine. Post-narcotic nausea and vomiting were also observed in about one per cent. There were no deaths. As persons up to the age of twenty-five to thirty are liable to be restless even under a large initial dose, and to suffer from post-operative excitation, the author prefers to give them ether. Old people, on the other hand, tolerate evipan remarkably well, and usually need very little of it—for instance, in the case of a woman aged eighty, with a fracture of the femur requiring no operative fixation which took twenty minutes to perform, only 1.5 cc. of evipan was needed. The largest dose (30 cc.), was given to a man aged fifty-two, in whom resection of the stomach for gastric ulcer took one hundred and five minutes. The longest operation lasted one hundred and twenty minutes, during which time 14 cc. of evipan was given to a man aged sixty-

nine whose stomach was resected for cancer. The author considers that evipan is only contraindicated in cases of advanced hepatic insufficiency, and to a certain extent in young people. He has had no experience of evipan narcosis in childhood.—H. ELTORM. *Ugeskr. Laeg.* (July 15, 1937), 757; through *Brit. Med. J.*, 4006 (1937), 782B. (W. H. H.)

Sodium Evipan Anesthesia. The authors are satisfied with their trial of sodium evipan narcosis in one hundred and thirty tonsil and adenoid operations in children. They used no preliminary medication, and attach much importance to very slow intravenous injection; they injected 1 cc. of fresh 10% solution during one minute until the child ceased to count, slept and snored. If snoring did not occur or restlessness was noted a further 0.5 cc. was given to children under 6 years, or 1 cc. if older. Children aged from $1^1/_2$ to 2 received from 1 to 2 cc., and from $2^1/_2$ to 3, 2 to $2^1/_2$ cc., while children aged 4, 5 to 8, 9 to 11 and 12 to 14 received 2 to 3, $2^1/_2$ to 3, 3 and 3 to 4 cc., respectively. With a slow injection the dosage could be graduated to a considerable extent according to individual response; such a method is greatly preferable to rigid dosage according to body weight, and requires considerably less of the anesthetic. Six cases only required 5 cc., but five of these were early cases in which quicker injection was used. Three cases required a supplement of ether, and one instance of collapse was noted in a mongol aged $1^1/_2$. Sleep for ten to thirty minutes after operation was the rule.—I. HOFER and K. EBERLE. *Wien. klin. Wochschr.* (July 30, 1937), 1126; through *Brit. Med. J.*, 4006 (1937), 782B. (W H. H.)

Sodium Iodide—Intravenous Use of, in Actinomycosis. Intravenous sodium iodide has been successfully used in the treatment of cattle actinomycosis for over four years. Dosage is one ounce of sodium iodide in one pint of water for animals weighing 1000 pounds, one and one-half ounces for those weighing 1500 pounds, and four to six drams for those weighing 500 pounds. The treatment does not cause loss of flesh and causes only a slight decrease in lactation. Only a single injection is needed, and iodism is not produced. However, the injection usually causes abortion in pregnant animals.—J. FARQUHARSON. *J. Am. Vet. Med. Assoc. N. S.*, 44 (1937), 551; through *Squibb Abstr. Bull.*, 11 (1938), 19. (F. J. S.)

Stomach and Intestinal Disorders—Contribution Concerning the Therapeutic Agents for the Treatment of, during 1936. The conclusion of an article including 24 references.—K. KOCH. *Apoth. Ztg.*, 52 (1937), 1606–1608. (H. M. B.)

Streptococcal Infections—Chemotherapy of. *p*-Aminophenylsulfonamide and *p*-benzylaminobenzenesulfonamide were equally valuable in the treatment of streptococcal tonsillitis, but the latter was somewhat less toxic. Larger doses than those usually advised were found advantageous. The combined administration of sulfonilamide and serum was found useful. The sulfonamides had no prophylactic value in checking the spread of tonsillitis under epidemic conditions. Infection by the hemolytic streptococcus was more amenable to treatment by the sulfonamides than infection by the *Streptococcus viridans*.—A. SMITH. *Lancet*, 233 (1937), 1064. (W. H. H.)

Streptococcal Peritonitis—Hemolytic, Sulfanilamide and the Macrophage Response to, in Mice. Phagocytosis of virulent strains is conditioned by the previous bacteriostatic action of the drug, which appears as an indirect one.—RUTH A. MCKINNEY and RALPH R. MELLON. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 333. (A. E. M.)

Testicular Extract in Vaccine Therapy. Report on fifty cases in which there was absence of focal or general reaction, and insignificant local reaction, with satisfactory therapeutic effect from Intotestan.—ALVARO VIEIRA. *Resenha Medica*, 3 (1936), 99; through *Rev. brasil. med. Farm.*, 13 (1937), 67. (G. S. G.)

Tuberculosis in the Guinea Pig—Retarding Action of Subcutaneous Injection of Ethyl Stearate, Palmitate and Laurate on the Development of. The animals were infected, then 0.5 cc. of one of the esters was injected twice weekly for 6 weeks. In all cases the progress of the disease was retarded, but not entirely prevented.—L. NÈGRE, A. BERTHELOT and J. BRETEY. *Compt. rend. soc. biol.*, 123 (1936), 864–865; through *Chimie & Industrie*, 38 (1937), 935. (A. P.-C.)

Urine—Potentiating Influence of, on Sulfanilamide Bacteriostatic Effect of E. Coli in Vitro. The action of sulfanilamide is considerably enhanced in the more alkaline range.—RALPH R. MELLON and LAWRANCE E. SHINN. *Proc. Soc. Expll. Biol. Med.*, 37 (1937), 331. (A. E. M.)

Vitamin B_1 and Neuritis. The gastrointestinal, cardiac and nervous symptoms of beriberi are described. The minimum vitamin requirement of any given individual in I. U. = 0.00066

× weight in pounds × calories consumed. A table is presented showing the calories and units of vitamin B_1 to be found in specific portions of eighty foods. The author obtained relief in 25° of the cases of neuritis accompanying degenerative arthritis of the spine, and symptomatic improvement in 80% of such cases using only symptomatic medicine. These results are comparable to the results obtained by others in dealing with the so-called infectious neuritis by the administration of vitamin B_1. This supports the conclusion that the administration of vitamin B_1 is not indicated except in those cases whose intake or absorption is low.—K. K. SHERWOOD. *Northwest Med.*, 36 (1937), 385; through *Squibb Abstr. Bull.*, 10 (1937), A-2304. (F. J. S.)

Vitamin K—Recovery from the Anemia Caused by a Diet Deficient in. The administration of vitamin K to chicks showing a prolonged clotting time and a profound anemia restores both to normal values. Minute amounts of vitamin K permit complete recovery from anemia within a period of 3 days.—SIDNEY A. THAYER, R. W. MCKEE, D. W. MACCORQUODALE and EDWARD A. DOISY. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 417. (A. E. M.)

Vitamin Therapy—High, Treatment of Alcoholic Cirrhosis of the Liver with. There appears to be a significant relationship between nutritional deficiency and alcoholic cirrhosis of the liver. It is believed that patients with alcoholic cirrhosis are benefited by high vitamin therapy.—ARTHUR J. PATEK, JR. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 329. (A. E. M.)

Yellow Fever in Iquitos. Study of outbreak of yellow fever in wooded mountain province due to mosquito other than Stegomyia. Treatment with quinine found useless.—MIGUEL A. ROJAS. *Reforma Medica*, 23 (1937), 791. (G. S. G.)

NEW REMEDIES

SYNTHETICS

Anestheticum-Woelm Ampuls (M. Woelm, Eschwege, Germany) are sold in packages of 10, 25 and 100 ampuls containing 1 cc. of a 2 or 4% solution of *p*-aminobenzoyldiethylaminoethanol and 0.0004 Gm. adrenalin in isotonic solution. **Anestheticum-Woelm Dry Ampuls** are supplied in packages of 10 or 100 dry ampuls so that 1 cc. is equivalent to 0.02 or 0.03 Gm. *p*-aminobenzoyldiethyl-aminoethanol and 0.00002 Gm. adrenalin.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Basergine (Sandoz) contains ergobasine tartrate. It is found on the market in drops and in ampuls.—*Pharm. Weekblad*, 74 (1937), 958. (E. H. W.)

Benzedrine Tablets (Menley and James Ltd., London) contain in each tablet 5 mg. (0.077 gr.) of beta-phenyl-isopropylamine sulfate (isomyn sulfate). They are used for marcolepsy, post-encephalitic Parkinsonism, depression, fatigue, lowered mood, and in X-ray visualization of the gastro-intestinal tract. Use should be closely supervised by the physician. They are packed in bottles of 50 tablets.—*Australasian J. Pharm.*, 19 (1938), 80. (A. C. DeD.)

Calcium Mandelate (R. J. Strasenburgh Co., Rochester, N. Y.) tablets contain in each 0.5 Gm. of mandelic acid as calcium mandelate. Indicated in cases of urinary infections unassociated with urinary obstruction, and may be used to replace dietary measures in the treatment of chronic infections of the urinary tract, particularly those caused by the colon bacillus. The adult dose is 4 tablets four times daily after meals, followed by a small quantity of water; children 1–2 tablets. Calcium mandelate is supplied in bottles of 100.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

Causyth (Causyth Ltd., London) is a cyclohexatreine-pyridine-sulfonate of a pyrazolone derivative. It is used for sepsis, rheumatism, arthritis, influenza, scarlet fever, diphtheria, measles, undulent fever, enteric fever, tuberculous fever. The dose should be prescribed by the physician. It is marketed in tablets of 7.5 grains, in tubes of 20 and 10; suppositories of 15 grains in boxes of 10 and 5; powder in boxes of 150 grains, 1 ounce and 2 ounces; clinical packages: 300 tablets in 30 rolls of 10 tablets each; boxes of 4-ounce powder.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Deseptyl Ampuls (Sanabo, G. m. b. H., Vienna, 12th dist.) contain 0.50 Gm. of the sodium salt of *p*-aminobenzosulfamidemethylene sulfoxyl acid in 5 cc. There are 6 ampuls to the package.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Dimenformon (Organon Laboratories, London) for intestinal oestrogenic therapy by intramuscular injection. It is marketed in ampuls and vials containing 5.0 mg. of oestradiol benzoate in each cc.—*Australasian J. Pharm.*, 19 (1938), 80. (A. C. DeD.)

Eucupin Solution in Oil (Rare Chemicals, Inc., Nepera Park, N. Y.) is Eucupin base (isoamylhydrocupreine) 0.1%, ethylaminobenzoate 3% and benzyl alcohol 5% in oil of sweet almond. It is used for prolonged rectal anesthesia in the treatment of pruritus ani et vulvae, and in surgical repair of the anus and perianal region. It is injected fan-wise to avoid superficial instillation or pooling. Supplied in boxes of 6 5-cc. ampuls. **Eucupin-Procaine Solution** is eucupin dihydrochloride 0.2% and procaine hydrochloride 1% in Ringer's Solution. Used for prolonged surgical anesthesia in proctology, exodontia and laryngology. For tonsillectomies 8 drops of 1:1000 epinephrine should be added to each 30 cc. Supplied in serum bottles of 30 cc.—*Drug. Circ.*, 82, No. 3 (1938), 24, 25. (E. V. S.)

Ferroglucon Ampuls (Eggochemia, Vienna, 19th dist.) contain 0.104 Gm. iron gluconate per cc. They come in packages of 3 or 10 ampuls of 2 cc.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Hepton-Calcium Ampuls (Sanabo, G.m.b.H., Vienna, 12th dist.) are available in packages of 1 or 6 ampuls of 5 or 10 cc. or of 3 or 6 ampuls of 2 cc. which contain a 36.8% aqueous solution of calcium glucoheptonate.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Kres-lumin (Cremanyl) (Bayer Products Ltd., London) is a fluid preparation of calcium cresol sulfonate, containing luminal $^1/_{10}$ grain to the teaspoonful. It is an agreeable expectorant and cough sedative-bronchitis, whooping-cough, pulmonary tuberculosis, laryngitis. The dose for adults is 2–3 teaspoonfuls three or four times a day, for children $^1/_2$ teaspoonful, according to age. Kres-lumin is supplied in 4- and 16-ounce bottles.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Links-Glucosan Vials (M. Woelm, Eschwege, Germany) are sold in packages of one or 3 vials containing 2% of *o*-dioxyphenylethanolmethylamine and 2% methylaminoacetopyrocatechol.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Lodal (Burroughs Wellcome and Co., London and Sydney). "Lodal" chloride, 6:7-dimethoxy-2-methyl-3-4-dihydro-isoquinolinium is an oxidation product of laudanosine. It is used for uterine hemorrhage and pain; uterine cancer and hemorrhage of the menopause. Tabloid "Lodal" chloridi, gr. 1 (sugar-coated). The dose is one or two tabloids, with a little water, three times a day.—*Australasian J. Pharm.*, 19 (1938), 288. (A. C. DeD.)

Persutanes Anesthetic (Mucous Membrane) (A. Kuhn, Hardheim im Baden) is marketed in 10-cc. bottles and contains 17% *p*-ethylaminobenzoate, 7.4% *p*-monochlorphenol, and 0.5% methyl salicylate in alcohol.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Selvoral (Bayer Products Ltd., London) is the calcium salt of gluco-hexa citric acid, contains 8.5% calcium. It is used for allergic substances: asthma, hay fever, urticaria, serum rashes. Calcium efficiency: rickets, pregnancy, tetany. Hemorrhage. Eczema, psoriasis, pruritus. The dose for adults is 2 heaped teaspoonfuls (about 30 grains) two or three times a day; for children: a level teaspoonful two or three times a day. It is marketed in boxes of 50 and 500 grains.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Specialties

Allantoin Cream with Metaphen (Abbott Laboratories, North Chicago, Ill.) contains 2% allantoin in a greaseless stearate vehicle with the addition of Metaphen 1:5000. The cream is used in the treatment of osteomyelitis and certain other chronic suppurative conditions. It is supplied in tubes of 1 and 5 ounces.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

Atonsil Tablets (F. J. Kwizda, Korneuburg) are sold in packages of 12 and contain in each 0.12 Gm. novuropurat, 0.08 Gm. aluminum boroformate, 0.004 Gm. camphor Helini, 0.004 Gm. diaminomethylacridinium chloride, 0.03 Gm. of the ethyl ether of *p*-aminobenzoate.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Belalin-s (Eli Lilly and Co. Ltd., London) is synthetic vitamin B_1. It is used for various neuritic conditions. Can be obtained in tablets of 0.1 mg. and 1.0 mg. (40 and 400 Sherman units); ampuls 1.0 mg. (400 S. units = 300 international units).—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Caapi (H. R. Napp Ltd., London) contains atropine sulfate gr. 1–180, caffeine gr. 1, phenacetin gr. 2, quinine alkaloid gr. $^1/_4$, cinnamon pulvis gr. 1, in each tablet. It is used for coryza, hay fever, asthmatic conditions and whooping-cough. The dose is two tablets initially, followed by one at intervals, with a maximum of six daily. For children, dosage is adjusted as to

age. It is marketed in boxes of 12 tablets and bottles of 100 tablets.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Campolon (Bayer Products Ltd., London) is a specifically fractionated extract of liver of high therapeutic potency, administered intramuscularly. It is used for pernicious anemia and certain secondary anemias, subacute combined degeneration, sprue, lead and bismuth poisoning, salvarsan dermatitis, disseminated sclerosis. The dose is one intramuscular injection of 2 cc. daily. Depot dosage: one injection of 10 cc. or more each week or fortnight. It is marketed in ampuls of 2 cc., in boxes of 5 and 25, and lots of 100, 5 cc. in box of 3 and 15; bottles of 10 cc.—*Australasian J. Pharm.*, 19 (1938), 288. (A. C. DeD.)

Capsiplast-Beiersdorf (Beiersdorf & Co., G.m.b.H., Vienna, 10th dist.) contains salicylic acid, extract capsicum, extract belladonna in plaster base.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Carbomucil (H. R. Napp Ltd., London) is activated charcoal in granular form, with a central core of the desiccated vegetable mucin, "Normacol." It is used in toxic conditions of intestinal tract, dysentery, diarrhoea, etc. The dose is 1–3 teaspoonfuls three times a day, between meals, swallowed with a draught of water. It is marketed in tins of 4 ounces.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Congostyp Ampuls (Adler-Apotheke, A. Kremel, Vienna, 14th dist.) are a 1% aqueous solution of congo red Merck with sodium hydroxide and is sold in packages of 3.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Deriphyllinum Compositum (Chemiewerk Homburg, Frankfurt) contains 0.2 Gm. deriphyllinum and 15 mg. phenylethylbarbituric acid per 2-cc. ampul. The suppositories contain 0.6 Gm. deriphyllinum and 40 mg. phenylethylbarbituric acid per suppository and the drops contain 0.2 Gm. of deriphylline and 7.5 mg. phenylethylbarbituric acid per cc. It is used as a diuretic and cardiac.—*Pharm. Weekblad*, 74 (1937), 959. (E. H. W.)

Diphtheria-Formoltoxoid (Anatoxine) (Stadliches Sero-Therapeutisches Institut, Vienna) is a diphtheria preventative. Toxoids are substances obtained from bacterial toxins made harmless (by formalin) but still retain immunizing properties.—*Pharm. Weekblad*, 74 (1937), 792. (E. H. W.)

Duochol (Paul Plessner Co., Detroit, Mich.) are tablets containing in each highly purified bile salts 2 gr., sodium salicylate 2 gr., together with aromatics and stomachics. They are indicated in chronic cholecystitis, toxic hepatitis, stone-free cholangitis and in constipation due to gallbladder disease. Duochol tablets are supplied in bottles of 100, 500 and 1000.—*Drug. Circ.*, 82, No. 3 (1938), 24. (E. V. S.)

Ferro 66 (Chemische Fabriek Promonta) is according to the statement of this firm a biologically active form of ferrous iron stabilized by vitamin C (ascorbic acid). The preparation occurs in pastilles containing 70 mg. of iron and as drops containing 100 mg. iron in 20 drops.—*Pharm. Weekblad*, 74 (1937), 793. (E. H. W.)

Gitalin (Amorphous) (Rare Products, Inc., New York) is the new name for Verodigen.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

Hogastrin (Giles, Schacht and Co., Clifton, Bristol) is a palatable liquid extract of hog's stomach, containing hemopoietin in stable solution. It is used in pernicious and post-operative anemias. The dose is two teaspoonfuls in water three times a day. It is marketed in 4-, 8- and 16-ounce bottles.—*Australasian J. Pharm.*, 19 (1938), 288. (A. C. DeD.)

Immidiol (H. R. Napp Ltd., London) is a mixture of anthraquinone glucosides in a salicylic acid alcoholic solution. It is used in anginas of the mouth and throat (simplex, catarrhalis, tonsillans, herpetic, folliculis, lingualis, Vincent's, etc.); diphtheria (in conjunction with specific treatment). The dose is half teaspoonful mixed with half glass warm water, gargling every $^1/_4$–$^1/_2$ hour; or undiluted as a spray or paint of the affected part. It is supplied in bottles.—*Australasian J. Pharm.*, 19 (1938), 288. (A. C. DeD.)

Iodotab (Clay and Abraham Ltd., Liverpool). Pleasantly flavored tablets, each containing iodine, gr. $^1/_{10}$ with 4 gr. milk powder. They are used for treatment of rheumatism, hypothyroidism, etc., and as a prophylactic against colds and influenza.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Kolpon (Organon Laboratories, London) is oestrone in glucose base, with a buffer substance giving an acid vaginal secretion. Each tablet of 2 mg., contains 0.1 mg. of oestrone (1000

I. U.). It is used for vaginal leucorrhoea. The dose is one tablet intravaginally each night. It can be obtained in boxes of 12, 24, 40, 250 and 1000.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Lactoflavin Ampuls (Bayer, I. G. Farben.-A. G., Leverkusen a. Rhein) are sold in packages of 5 ampuls containing 2 cc. of solution of biologically standardized vitamin B_2 equivalent to 250 rat units or 1 mg. lactoflavin.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Lipo-Putin, Improved (Progestin) (Parke, Davis and Co., London and Sydney) is a standardized solution in oil of the hormone secreted by the corpus luteum. It is used for the prevention of abortion and menstrual disorders. Can be obtained in boxes of 6 x 1-cc. ampuls, each containing one rabbit unit per cc.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Melvaron (Malt Extract, Vitamins and Iron, Lilly) contains in each fluidounce 28,000 U. S. P. units vitamin A, 8000 U. S. P. units vitamin D, 112 international units vitamin B_1 synthetic, 35 Sherman units vitamin B_2 complex, iron and ammonium citrates green 4 grains and malt extract 240 minims. It serves as an admirable and unusually acceptable medium for the administration of vitamins A, B_1, B_2 complex and D and for use as a dietary supplement and tonic. Melvaron is supplied in bottles of one and $5^1/_2$ pounds.—*Drug. Circ.*, 82, No. 3 (1938), 24. (E. V. S.)

Mercury-Carbolic Plaster (Beiersdorf & Co., G.m.b.H., Vienna, 10th dist.) contains mercury and carbolic acid in a plaster mass.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Neo-Hepatex (Evans, Sons, Lescher and Webb Ltd., Liverpool and London) is a clinically tested, highly potent solution of the hemopoietic fraction of liver. It is used for the treatment of primary anemias by intramuscular or intravenous injection. For mild cases, the dose is 1 cc.; for average cases, 2 cc. intramuscularly on each of three successive days; thereafter 2 cc. at intervals of 7–10 days; in severer cases, larger doses. Neo-Hepatex can be obtained in boxes of 6 x 1-cc., 6 x 2-cc. and 3 x 4-cc. ampuls.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Nestrovite (Roche Products Ltd., London) is an accessory food preparation containing vitamins A, B, C and D in palatable form. Tablets and emulsion of one teaspoonful of the emulsion contain 5000 international units of vitamin A, 42.5 of vitamin B_1, 135 of vitamin C and 500 of vitamin D. Two of the tablets contain 13,000 international units of vitamin A, 130 of vitamin B_1, 400 of vitamin C and 1300 of vitamin D. It is used in infancy, childhood and convalescence; during pregnancy and convalescence, in gastro-intestinal disorders and in hypovitaminosis. The dose for infants is one teaspoonful of the emulsion daily, preferably mixed with the food; for children and adults, three teaspoonfuls of emulsion or two tablets daily. The emulsion can be obtained in $4^1/_2$-ounce bottles, and the tablets in boxes of 20 and 100.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Oestroglandol Ampuls (Hoffmann-La Roche, Basele) are sold in packages of 6 ampuls of 1.10 cc. and contain in each cc. 1000 international units of estrus hormone. **Oestroglandol Ointment** is packaged in 20-Gm. containers and supplies 1000 international units of estrus hormone in each Gm. **Oestroglandol Tablets** are sold in packages of 20 tablets containing in each 1000 international units of estrus hormone.—*Pharm. Presse*, 43 (1938), 133. (M. F. W. D.)

Panopsin (Endocrines-Spicer Ltd., Watford, Herts.) contains in each tablet $2^1/_2$ gr. of pancreatic amylopsin. It is used for indigestion, any condition of disturbed digestive function, nervous dyspepsia, fermentative dyspepsia, etc. The dose is one or two tablets immediately before meals. It is supplied in bottles of 50 tablets.—*Australasian J. Pharm.*, 19 (1938), 288. (A. C. DeD.)

"Plastules" Brand Hematinic Compound (John L. Wyeth and Bros. Ltd., London) is ferrous iron in semi-fluid form, kept stable in a plastic gelatin capsule; also contains concentrated yeast, providing vitamins B_1 and B_2. It is used for secondary anemias, general debility and convalescence. It is supplied plain and with liver extract, 30 in a box.—*Australasian J. Pharm.*, 19 (1938), 174. (A. C. DeD.)

Prolactin "Armour" is the physiologically active lactogenic factor from the anterior pituitary prepared and standardized according to the technic of Dr. Oscar Riddle and Dr. R. W. Bates of the Carnegie Institute of Washington. The potency is 100 units per cc. The dose is 1 cc. daily or every other day in courses of 30 cc. to stimulate lactation in the presence of a developed mammary tree. Supplied in rubber-stoppered vials of 5 cc.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

Pyophag Ointment (Pyophag Laboratory, Vienna, 13th dist.) is put up in 30-Gm. packages and contains extracts of chamomile leaves, peppermint leaves, mallow flowers, *Menthæ piperita and crispa*, sage leaves, chinosol and ointment base. **Pyophag Solution** is put up in 30-Gm. packages and contains the same extracts along with chinosol in glycerin. **Pyophag Healing Powder** contains the same extracts as above along with chinosol and talc. The package contains 30 Gm.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Salhumin Liniment (Chem. techn. Gesellschaft m.b.H., München-Pasing) is put up in 50- and 100-Gm. bottles and contains salhumic acid, salicylic acid, iodine, ethereal oils and chloroform liniment.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Solamin Ampuls (W. Dopplemann, Iserlolm) are sold in packages of 3 or 10 ampuls of 1.10 cc. which contains 0.000125 Gm. atropine, 0.000125 Gm. hyoscyamine, 0.025 Gm. pantephrin in physiological salt solution.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Stenovasan Ampuls (A. Löw, Fabrik chem. pharm. Präp., Vienna, 3rd dist.) are available in packages of 3 ampuls of 10 cc. each containing 0.24 Gm. theophylline ethylenediamine, 0.02 Gm. sodium nitrite, 0.10 Gm. glucose in distilled water.—*Pharm. Presse*, 43 (1938), 132. (M. F. W. D.)

Triv Tablets (Drug Products Co., Inc., Long Island City, N. Y.) is an aromatic combination of citro oxyquinol, dextrose, colloidal kaolin and calcium lactate. An aqueous solution of one tablet in one quart of water produces a solution with p_H approximately 4.5. It is used in the treatment of trichomonas vaginalis and vulvovaginitis. One or two tablets are inserted night and morning, when advisable douche with two quarts of warm acidulated water before inserting tablet in the morning. Triv tablets are supplied in bottles of 25, 100 and 500.—*Drug. Circ.*, 82, No. 3 (1938), 24. (E. V. S.)

Vi-Delta Emulsion (Lederle Laboratories, Inc., New York) is emulsified fish liver oils (other than cod fish), rich in vitamins A and D, with malt extract (vitamin B factor) and selected citrus juices rich in vitamin C. Each teaspoonful is the approximate equivalent in vitamins A and D to $1^1/_2$ teaspoonfuls of the best grade cod liver oil (U. S. P.). The adult dose is 4–6 teaspoonfuls daily, for infants 2–3 teaspoonfuls daily. Vi-Delta Emulsion is supplied in bottles 8 and 16 oz.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

Vioform (Ciba Ltd., London) is iodochloroxyquinoline. It is an odorless, non-irritant, innocuous, sterilizable substitute for iodoform. It is used to check suppuration; maintain asepsis; promote cicatrization; desiccant; and hemostatic. It is indicated in varicose ulcers, chancrorbs, burns, eczema, excoriations, dermatitis. It is prescribed as ointment (10%), suppositories, pessaries and glycerin suppositories; or sprinkled direct on affected surface (suppurative otitis media). Can be obtained in packages: powder in 4-ounce and 8-ounce packages, and dredgers.—*Australasian J. Pharm.*, 19 (1938), 81. (A. C. DeD.)

Vitelex Tablets (Drug Products Co., Inc., Long Island City) contain in each colloidal iron 15.5 mg., colloidal manganese 1.8 mg., combined calcium 34 mg., combined phosphorus 26 mg., vitamin B_1 75 Sherman units, vitamin B_2 (G) $7^1/_2$ Sherman units, vitamin D 250 U. S. P. units, lactose, dextrose, gluconates, arrow root and aromatics. It is used in the treatment of loss or lack of appetite, faulty nutrition, gastrointestinal derangement, lack of vitality, hemoglobin deficiency and as a source of calcium and phosphorus for nursing and pregnant mothers. One or two tablets after meals, or as required, chewed or swallowed. Vitelex tablets are supplied in bottles of 50 and 500.—*Drug. Circ.*, 82, No. 3 (1938), 25. (E. V. S.)

BACTERIOLOGY

Alcohol—Ethyl, Bacterial Formation of Esters of. A method is described for determining neutral esters by cold extraction with light petroleum. The rate of esterification under various conditions is examined. Acetic acid bacteria and yeasts esterify acetic, but not malic or tartaric acids. The latter acids are esterified only by a slow chemical reaction, the equilibrium of which is not attained even in thirty years. Bacterial esterification is reversible.—L. Espil, L. Genevois, E. Peynaud and J. Ribereau-Gayon. *Enzymologia*, 4 (1937), Part 2, 88; through *Physiol. Abstr.*, 22 (1937), 1107. (F. J. S.)

Antiseptics—Mercury, Study of, by the Agar-Cup Plate Method. Bichloride of mercury, mercurochrome, metaphen and merthiolate showed a decreased zone of inhibition of bacteria (*Staphylococcus aureus*) with an increase of the concentration of the horse blood in the agar. The

results can be expressed by the formula $C = Ke^{-mz}$ where C is the concentration of blood, K is a constant for each antiseptic having the value C when the zone is 0, e the base of Naperian logs., m the coefficient of inactivation of the antiseptic and z the zone in mm. The agar itself had no appreciable effect on the zone size. There is a correlation between the ordinary antiseptic dilution procedure and the agar-cup method.—S. BRANDT ROSE and RUTH E. MILLER. *J. Bact.*, 35 (1938), 2; through *Chem. Abstr.*, 32 (1938), 2289. (F. J. S.)

Aqueous Liquids—Apparatus for Sterilizing. Sterilization of water, etc., is affected by contact with gold, silver or copper, the conduit walls, baffles and foraminous blades of a propeller being made of the metal selected.—G. H. MEINZER. Assr. to CALIFORNIA CONSUMERS CORP. U. S. pat. 2,061,323; through *J. Soc. Chem. Ind.*, 57 (1938), 5. (E. G. V.)

B. Dysenteriæ—Infections of the Urinary Tract Due to. *B. dysenteriæ* may cause an acute infection of the urinary tract during or following an attack of intestinal dysentery. All three of the cases observed recovered within a few weeks after treatment with mandelic acid (two cases) or hexamethylenetetramine (Urotropin).—ERWIN NETER. *J. Infectious Diseases*, 61 (1937), 338; through *Squibb Abstr. Bull.*, 11 (1938), A-161. (F. J. S.)

B. Putrificus—Effect of p_H on the Growth of. The growth of *B. putrificus verrucosus* Zeissler is hindered, when lactic acid is added, not only by the hydrogen-ion concentration, but also by the undissociated lactic acid. The limits of p_H for the organism were determined by growing on different well-buffered media in the absence of lactic acid. The lowest p_H tolerated was 4.76, but there were considerable variations depending on the nature of the medium. Sodium lactate was added to the buffered media, and the concentration of undissociated lactic acid was calculated. Inhibitory effect began at 1.5×10^{-3} N; the concentration only just tolerated by the organism lay between 4.19×10^{-3} and 2.89×10^{-3} N, five strains of bacteria being used. The temperature of incubation had an effect upon the lactic acid poisoning and the p_H limits. At 25° C. the limiting p_H was higher than at 37°, and undissociated lactic acid showed more marked inhibitory action.—H. HOSTETTLER and E. ZOLLIKOFER. *Hoppe-Seyler's Z.*, 248 (1937), 183; through *Physiol. Abstr.*, 22 (1937), 1107. (F. J. S.)

Bacteria—Air-Suspended, Destruction of, by Irradiated Substances. Many organic substances (notably essential oils) examined produced peroxides on irradiation with ultraviolet light. Bactericidal action of such substances was unrelated to their peroxide contents. In many cases "aging" of irradiated substances, resulting in diminished bactericidal activity, occurs.—M. BECHOLD. *Z. Hyg.*, 119 (1937), 193; through *J. Soc. Chem. Ind.*, 57 (1938), 109. (E. G. V.)

Bacteria—Mannitol-Producing. A bacterium that produced mannitol, isolated from dried sweet potato, resembles morphologically and physiologically *Bacterium mannitopœum*. It did not ferment mannitol nor produce carbon dioxide from fructose and dextrose. Hence it was named as *Bacterium mannitopœum* var. *batatas*.—BENSHIRO NOMURA. *J. Agr. Chem. Soc. Japan*, 13 (1937), 558; through *Chem. Abstr.*, 32 (1938), 1739. (F. J. S.)

Bacteria—Purple, Physiology of. Apparently pure cultures were obtained in liquid media. The sulfur-free purple bacterium *Rhodovibrio* was cultivated by the same methods as *Thiocystis*. Organic material retarded the growth of these organisms. Short exposure of *Thiocystis* to ultraviolet light was not harmful but accelerated growth, and exposure of one hour did not kill it. Rhodovibrios were quickly killed by ultraviolet light. The fluorescent color of *Rhodovibrio* cultures was proportional to the purity of the culture. *Thiocystis* can use many sulfur compounds and change them to sulfates. Nineteen references.—ANNA LEHNER. *Zentr. Bakt., Parasitenk., II Abt.*, 97 (1937), 65; through *Chem. Abstr.*, 32 (1938), 1743. (F. J. S.)

Chlorine Compounds—Germicidal Properties of. A critical review of 73 literature citations shows a marked lack of agreement in regard to relative germicidal efficiencies of different chlorine compounds and the mechanisms of their germicidal action. Bacterial spores were very suitable for studying the factors affecting germicidal properties of chlorine compounds. In experiments with chloramine-T, it was found that doubling the concentration reduced the killing time approximately one-half and that increasing the temperature 10° resulted in a killing-time reduction of 71.5–82%. Changes in p_H value had a very marked effect on the germicidal properties, the more acid reactions being more germicidal. Hypochlorites were more markedly affected by changes in p_H, temperature and chlorine concentration than was the case with chloramine-T. Chloramine solutions were not influenced as greatly by changes in the reaction (p_H) as was the case with hypochlorites or chloramine-T. For a given chlorine concentration, chloramine-T

exhibited the weakest germicidal action; in solutions more alkaline than p_H 9.5 to 10.0 monochloramine was more germicidal that hypochlorites; in less alkaline solutions hypochlorites were more germicidal. In disinfection with hypochlorites the concentration of hypochlorous acid was the significant factor in germicidal action. In disinfection with chloramine and chloramine-T, however, hypochlorous acid did not play a significant rôle. Disinfecting action for all compounds is associated with the presence of a positive chlorine atom.—DAVID CHARLTON and MAX LEVINE. *Iowa Eng. Expt. Sta., Bull.*, 132 (1937), 60 pp.; through *Chem. Abstr.*, 32 (1938), 1863. (F. J. S.)

Corynebacterium Diphtheriæ—Effect of Serum on the Colonial Form of. The effect of different sera on the growth of *Corynebacterium diphtheriæ* varies with the concentration of serum used. Horse, ox and sheep sera in certain concentrations tend to obscure the differential growth characters of the different types of *Corynebacterium diphtheriæ;* rabbit and guinea-pig sera have no such effect. Antibacterial rabbit serum in agar tends to obliterate type differentiation of gravis strains but the effect is limited and appears to be to some extent serologically type-specific. There is no evidence that antitoxic horse serum has any greater power of affecting type differentiation than normal horse serum. The sample of antitoxin used markedly reduced the size and number of colonies produced by several gravis strains.—R. KNOX. *J. Path. Bact.*, 45 (1937), 733; through *Squibb Abstr. Bull.*, 11 (1938), A-67. (F. J. S.)

Disinfectants—Strong, New Apparatus for the Determination of *k* Values of. A pipette is mounted over a platinum loop above a revolving Petri dish containing water. A known quantity of suspension is placed in the loop and a drop of disinfectant allowed to fall from the pipette through the loop into the dish. This method is useful for strong disinfectants.—M. L. ISSACS. *J. Bact.*, 35 (1938), 2; through *Chem. Abstr.*, 32 (1938), 2289. (F. J. S.)

Dressings—Sterilization of, in Closed Containers. Dressings in closed metal boxes are sterilized by adding moistened cotton to the contents of the box before closing, autoclaving ten minutes with flowing steam, then bringing the pressure rapidly to 3 Kg. (145°), discontinuing the heating, maintaining equal pressure between the autoclave and a control box equipped with a manometer, cooling rapidly to 125° by emptying the autoclave and admitting compressed air, and holding for five minutes before bringing to atmospheric pressure. Presumably sterilization occurs during this process when the vapor from the water within the dressing box condenses on the dressing when the temperature is lowered.—A. LESEURRE. *Bull. sci. pharmacol.*, 44 (1937), 508; through *Squibb Abstr., Bull.*, 11 (1938), A-59. (F. J. S.)

Drinking Water—Sterilization of, with Minimal Doses of Chlorine. Clear water from wells, galleries and filter-plants can be sterilized in many cases by $^1/_6$–$^1/_{10}$ of the optimum ascertained quantities of chlorine.—T. N. S. RAGHAVACHARI and P. V. S. IYER. *Indian J. Med. Research.*, 24 (1936), 103; through *J. Soc. Chem. Ind.*, 57 (1938), 111. (E. G. V.)

Food Poisoning—Two Outbreaks of. Two outbreaks, one due to *Staphylococcus aureus* in cream-custard cakes (110 cases) and the other due to *Clostridium botulinum* in canned antipasto (10 cases), are reported. The effect of intravenous injection of hypertonic solutions of glucose in cases of botulism is discussed.—J. C. GEIGER. *U. S. Publ. Health Rep.*, 52 (1937), 765; through *J. Soc. Chem. Ind.*, 57 (1938), 109. (E. G. V.)

Germicidal Substances—New Method for the Evaluation of. Since the phenol coefficient fails to take into account the toxicity of germicides for living tissues when taken internally or on mucous surfaces, a new method of evaluating germicides is presented. This method gives a figure which is known as the toxicity index. The toxicity index is defined as the ratio of the highest dilution of disinfectant required to prevent the growth of embryonic chick heart tissue during 48 hours to the dilution required to kill a given test organism in ten minutes. The toxicity indices to iodine, iodine trichloride, hexylresorcinol metaphen, phenol, K_2HgI_4, merthiolate and mercurochrome in respect to *Staphylococcus aureus* and *Eberthella typhosa* are: 0.09 and 0.08; 0.40 and 0.28; 2.8 and 0.25; 3.0 and 2.8; 12.7 and 0.84; 12.9 and 8.4; 13.3 and 0.11; 35.3 and 35; and 262.0 and 35. An index less than one indicates that the germicide is more toxic to the bacteria than to the tissue. These germicides are to be tested again in an effort to control some of the more obvious variables.—A. J. SALLE, W. A. MCOMIE and I. L. SHECHMEISTER. *J. Bact.*, 34 (1937), 267; through *Squibb Abstr. Bull.*, 11 (1938), A-21. (F. J. S.)

Human Milk—Antiseptic Properties of. Cultures of human milk and cows' milk were collected under sterile conditions, and inoculated with pathogenic organisms. Human "inhibians"

stronger, but deteriorate on standing.—CURRENT COMMENT. *J. Am. Med. Assoc.*, 109 (1937), 1640. (M. R. T.)

Hydrogen Sulfide Production—Advantages of Peptone Iron Agar for the Routine Detection of. In a study of 376 bacterial strains, representing all the common species of the Gm.-negative enteric group, the cocci and the ærobic sporogenous bacteria, it has been found advantageous to use peptone iron agar rather than lead acetate agar for the detection of hydrogen sulfide. The color formed is black, rather than brownish black or brown, and is apparent after a shorter incubation time. The production of hydrogen sulfide is a valuable differential test in separating certain closely related bacterial species or types.—R. P. TITTSLER and LESLIE A. SANDHOLZER. *Am. J. Pub. Health*, 27 (1937), 1240; through *Squibb Abstr. Bull.*, 11 (1938), A-27. (F. J. S.)

Hypochlorite Solutions—Some Factors Affecting the Germicidal Efficiency of. Increasing the concentration of the available chlorine fourfold reduces the killing time to about one-half. Changes in p_H affect the germicidal power to a much greater extent than do changes in the concentration of available chlorine, the germicidal power decreasing with increasing H-ion concentration. Germicidal power increased with rising temperature, the killing time being reduced from 50 to 75% for a rise of 10°.—A. S. RUDOLPH and MAX LEVINE. *J. Bact.*, 35 (1938), 3; through *Chem. Abstr.*, 32 (1938), 2289. (F. J. S.)

Isamine Blue—Reaction of, with Serum. When isamine blue (I) and serum (II) are mixed in suitable proportions, the dye forms a blue deposit, leaving a supernatant fluid containing less globulin (III) than originally present. This reaction may be useful for the quantitative estimation of III in II and other body fluids. If a I solution of suitable strength is added to horse serum, and antihorse serum is mixed in optimal proportions, I is precipitated; thus I can be used as an indicator of the specific reaction of an antigen with its homologous antibody.—H. R. DEAN. *J. Path. Bact.*, 45 (1937), 745; through *Squibb Abstr. Bull.*, 10 (1937), A-2278. (F. J. S.)

Mycobacterium Tuberculosis—Egg as a Medium for Cultivation of, from Tuberculous Material. The concentrated sputum is injected into the yolk of a hard boiled egg through a hole in the shell, after cleaning of the latter with 5% phenol and alcohol. The hole is sealed with paraffin and the egg is incubated for 20 days.—G. I. WALLACE and M. R. WEISSBUCH. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 304. (A. E. M.)

Nicotinic Acid as a Growth Accessory Substance for the Diphtheria Bacillus. The method of Cherbuliez, Plattner and Ariel for preparation and distillation of the acetylated esters of amino acids has been applied to a study of tissue extract required by the diphtheria bacillus for growth. Distillates so prepared from a liver-extract concentrate contain the greater part of the growth-promoting activity of the extract. One of the active substances has been isolated in a quantity of about ten mg. from three hundred Kg. of liver and identified as nicotinic acid. Its maximum effect appears to be exerted at a concentration of about 1γ/cc. of medium but varying somewhat with the composition of the control medium. Nicotinamide is effective in approximately ten times the concentration of the free acid. One or more additional active substances are also present in the distillate and are now being investigated.—J. H. MUELLER. *J. Bact.*, 34 (1937), 429; through *Squibb Abstr. Bull.*, 10 (1937), A-2281. (F. J. S.)

Onion Vapors—Bactericidal Effects of. Agar treated with onion fumes before inoculation inhibited the growth of *Mycobacterium smegmatis*, *Bacillus mycoides*, *Bacillus subtilis* and *Serratia marcescens*, in decreasing order of effectiveness. The spores of *B. subtilis* and *B. mycoides* were only slightly more resistant than the vegetative forms. The bactericidal emissions from one Gm. of onion increased with increasing temperature from 10° to 37° and were exhausted by successive exposures to agar plates. The bactericidal effect of onion vapors was not as strong as, and was more quickly exhausted than, that previously found with garlic vapors (cf. *S. A. B.*, 9 (1936), 1160).—T. H. LOVELL. *Food Research*, 2 (1937), 435; through *Squibb Abstr. Bull.*, 10 (1937), A-2237. (F. J. S.)

Pimelic Acid as a Growth Accessory for the Diphtheria Bacillus. Pimelic acid stimulates the growth of a test strain of diphtheria bacillus in a concentration of 0.005γ/cc. of medium, and reaches a maximum in five times this concentration. Pimelic acid has been isolated from cow urine in a quantity of *ca.* 0.6 Gm./100 gallons.—J. H. MUELLER. *J. Biol. Chem.*, 119 (1937), 121; through *Physiol. Abstr.*, 22 (1937), 1105. (F. J. S.)

Serum—Kinetic Properties of Solutions, upon the Action of the Compensated Dialysis of Serum. The author describes the course of conductivity and studies the distribution of the saline

ions during dialysis of the serum against a saline solution. A minute experimental analysis allows the physical and chemical mechanism of the apparently anomalous course observed to be established, and allows some considerations to be given about the dynamic determinism of the membrane equilibria even with reference to biological systems.—G. VANZETTI. *Biochim. terap. sper.*, 16 (1938), 6. (A. C. DeD.)

Staphylococcus Toxin—Studies in, the Phenomenon of Hot-Cold Lysis by Active Staphylococcus Filtrates. The increased hemolytic action of staphylococcus filtrates produced by warm and then cold incubation was found to be a general occurrence in staphylococcal exotoxins and not due to any abnormal toxins or unknown interfering substances.—B. S. LEVINE. *J. Infectious Diseases*, 61 (1937), 345; through *Squibb Abstr. Bull.*, 11 (1938), A-217. (F. J. S.)

Sterilizing Effects of Mixtures of Air and Steam, and of Superheated Steam. The following summary is given: (1) There is no evidence that mixtures of air and steam are less effective than steam alone, provided that the spores are exposed to the saturated atmosphere and are really at the temperature they are assumed to be, and provided that the method of removing the air is not such as itself to constitute a sterilizing process. (2) Steam does not lose its sterilizing power as soon as any degree of superheating exists, but continues to be effective when superheated by 5° to 15° or more, depending on its initial temperature. (3) It is suggested that the cause of the continued effectiveness is that the essential feature of steam sterilization is the equilibrium between the aqueous solution which constitutes the bacterial cell and the steam atmosphere, which is attained, not when the steam is saturated with respect to pure water, but when it is saturated with respect to the solution.—R. M. SAVAGE. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 451–462. (S. W. G.)

Sterilizing Substances Used in Pharmacy. Two commercial preparations are shown to consist of $KICl_4O_2$ and p-$C_6H_4Me.SO_2.NClNa$, respectively.—G. LUSIGNANI. *Boll. chim.-farm.*, 76 (1937), 504; through *J. Soc. Chem. Ind.*, 57 (1938), 102. (E. G. V.)

Tea—Microbiology of. II. Influence of Tea Extract on Soil Micro-Organisms. The action of aqueous extracts of tea on *B. subtilis*, *Azotobacter*, yeasts and *Aspergillus niger* is proportional to the tannin content of the extracts. Yeasts were stimulated by the extracts.—A. ITANO and Y. TSUJI. *Ber. Ōhara Inst. landw. Forsch.*, 7 (1937), 491; through *J. Soc. Chem. Ind.*, 57 (1937), 92. (E. G. V.)

BOTANY

Boron—Influence of, on the Nitrate Metabolism. Treatment of barley seedlings with borax diminished their growth, nitrogen intake and the amount of nitrate and chlorophyll per Gm. of leaf. Boron disturbs the nitrogen metabolism of plants.—E. W. SCHMIDT. *Ber. deut. botan. Ges.*, 55 (1937), 356; through *J. Soc. Chem. Ind.*, 57 (1938), 90. (E. G. V.)

Chlorides and Sulfates—Effect of, on the Mineral Nutrition of the Plant. When increasing applications of sulfate and chloride fertilizers are added to wheat and sugar beet, a fixed amount of sulfate, but increasing amounts of chloride, are absorbed by the plant. The excess of sulfate in the soil is harmless, but the excess of chloride may be injurious. Large dressings of chloride fertilizers tend to increase the water content of sugar beet. If seed and fertilizer are sown together the chloride content of the fertilizer should be smaller than when applied before sowing.—E. DEMOUSSY and G. BARBIER. *Compt. rend. acad. agr. France*, 23 (1937), 699; through *J. Soc. Chem. Ind.*, 57 (1938), 90. (E. G. V.)

Coffea Arabica—Physiology of. II. Stomatal Movements in Relation to Photosynthesis under Natural Conditions. The marked midday closure of stomata on sunny days is due to the direct action of radiation on the stomata and not to water relations of the leaf. Movements of the stomata and changes in photosynthetic rate appear to be closely correlated.—F. J. NUTMAN. *Ann. Botany* [N. S.], 1 (1937), 681; through *Chem. Abstr.*, 32 (1938), 1747. (F. J. S.)

Enzymes—Plant, Determination of. The difficulties of determinations and the significance and importance of results obtained are discussed.—Z. I. KERTESZ. *Plant Physiol.*, 12 (1937), 845; through *Chem. Abstr.*, 32 (1938), 1749. (F. J. S.)

Enzymic Histochemistry. XXIII. Distribution of Amylase in the Outer Layers of the Barley Grain. The aleurone cells are poor in amylase, but the boundary layer between these and the starch cells is rich, containing 15% of the total present in the grain. Previous to germination β-amylase alone is present, and only one-third of that present is active. Subsequently the total

amylase increases, the active proportion remaining about the same, while some α-amylase also appears in the boundary layer.—K. LINDERSTRÖM-LANG and C. ENGEL. *Enzymologia*, 3 (1937), 138; through *Physiol. Abstr.*, 22 (1937), 1111. (F. J. S.)

Histone Bases in Plant Products. Chemical and biological examination of aqueous extracts of coffee, cereal products, etc., confirm the presence of preformed histone bases. Analytical data for the content in various fractions (*e. g.*, that precipitated by methyl alcohol) are tabulated.—B. BLEYER, W. DIEMAIR, F. FISCHLER, F. ARNOLD and H. BICKEL. *Biochem. Z.*, 292 (1937), 301; through *Physiol. Abstr.*, 22 (1937), 1113. (F. J. S.)

Hormones—Parathyroid and Thyroid, Experiments on the Influence of, upon the Growth of Seedlings. The results of these experiments were not very conclusive. The parathyroid hormone seemed to decrease the length of roots in *Avena sativa;* while the thyroid hormone had the same effect of roots of *Phaseolus multiflorus.*—E. D. BRAIN. *Ann. Botany* [N. S.], 1 (1937), 615; through *Chem. Abstr.*, 32 (1938), 1747. (F. J. S.)

Phosphatides—Plant. A phosphatide was isolated from lucerne which contains 4.92% of phosphorus.—B. REWALD. *Biochem. Z.*, 289 (1936), 73; through *Physiol. Abstr.*, 22 (1937), 1112. (F. J. S.)

Plant Growth Substances. XXVI. Effect of Biotin, Aneurin and Mesoinositol on the Growth of Fungi. Some of the phycomycetes, ascomycetes and basidomycetes do not grow on synthetic media unless one or more of the growth substances biotin, mesoinositol and aneurin is added; others not requiring added growth substances are stimulated in some cases by their addition. β-Alanine and *l*-leucine do not promote the growth of these fungi. In the presence of mesoinosital or mesoinositol plus aneurin, biotin at a dilution of $1:25 \times 10^{10}$ stimulates the growth of *Nematospora gossypii*, but its optimal concentration is $1:25 \times 10^{8}$. Some of the fungi not stimulated by the growth substances probably produce their own requirements thereof and some produce biotin, others aneurin in amounts sufficient to promote growth of fungi which require them.—F. KÖGL and N. FRIES. *Hoppe-Seyler's Z.*, 249 (1937), 93; through *Physiol. Abstr.*, 22 (1937), 1110. (F. J. S.)

Seeds, Bulbs, Tubers and Roots—Treatment of. The seeds, etc., are coated with preserved latex containing (*a*) metallic oxide or oxides, or a dye and/or zinc chloride or stannous chloride, to alter the color of the flowers produced, (*b*) suitable essential oils (pinene, limonene) to impart a preselected taste and/or odor to the fruits. The use of turpentine is excluded.—G. E. HEYL. Brit. pat. 470,843 and 470,910; through *J. Soc. Chem. Ind.*, 57 (1938), 94. (E. G. V.)

Urease Distribution in Canavalia Ensiformis. The total urease content per plant and the urease concentration of various parts of jack bean seedlings were determined on seedlings through the stage 40 days old. In all organs there was rapid synthesis of urease in rapidly dividing parenchyma cells, with the urease content of a cell reaching a maximum at the end of the elongation stage. After this stage there is a decrease of the enzyme until the urease content of the cell is down to a certain level. Cells containing the densest cytoplasm have the highest content of urease.—SAM GRANICK. *Plant. Physiol.*, 12 (1937), 601; through *Chem. Abstr.*, 32 (1938), 1747. (F. J. S.)

Vitamin C (*l*-Ascorbic Acid)—Histochemical Identification of, in Plants. Ascorbic acid present in cell sap can be shown by the Prussian blue reaction, the browning of the cell sap by potassium permanganate solution and the red coloration with *o*-nitrosonitrobenzene. In some degree a specific reaction for ascorbic acid in plant cells is the blackening of the cell contents by acidified silver nitrate solution. Acidified silver nitrate produces on living chlorophyll grains, more or less rapidly, black points of metallic silver. It is considered as very probable that vitamin C bound with the chlorophyll disks is responsible for this reduction. This assumption is supported as to its correctness by suitable chemical and extensive biochemical investigations of Giroud. Giroud's findings by statistical means of a relationship between the presence of chlorophyll and vitamin C find a natural explanation in D.'s assumption of a genetic relationship between these two substances. The recently found relationship by Giroud of a parallelism between the occurrence of carotenoids and vitamin C is not of a general nature and it is easily explained likewise on the assumption of the genesis of vitamin C in connection with the small chlorophyll disks. The relation between chlorophyll, the carotenoids and vitamin C in leaves and in different types of fruit during the vegetation period is discussed. Sixteen references.—OTTO DISCHENDORFER. *Protoplasma*, 28 (1937), 516; through *Chem. Abstr.*, 32 (1938), 1750. (F. J. S.)

Vitamins—Rôle of, in Plant Development. A review with 153 references.—JAMES BONNER. *Botan. Rev.*, 3 (1937), 616; through *Chem. Abstr.*, 32 (1938), 1757. (F. J. S.)

CHEMISTRY

GENERAL AND PHYSICAL

Adsorption Methods—Chromographic. A review of a lecture by L. Zechmeister, in Copenhagen, on the history of the development of the chromographic adsorption methods, and their use especially for carotinoids.—F. REIMERS. *Arch. Pharm. Chemi*, 44 (1937), 699. (C. S. L.)

Caustic Liquors—Analyses of, for Traces of Impurities. The method employed is a method of internal control in which the analysis is made from measurements on the relative intensities of spectral lines of the test elements and of a control element which is present in or is introduced into the specimen in a definite and constant amount. The relative intensity of such a pair of lines is a function of the abundance of the test element, and this function must be determined for each element. By measuring the relative intensities of a selected pair of lines excited in a suitable spectroscopic source for a series of prepared solutions in which the amount of test element is varied over the range desired, the required function can be discovered. The function is usually expressed as a relationship between the logarithm of the relative intensities of a selected line of the test element and of the control element, and the logarithm of the percentage abundance of the test element. The graph of this function is used as the working basis for the determination of that element. Those lines are used ordinarily which give a linear function when plotted as described. The method has been applied to various inorganic and pharmaceutical chemicals and plastics.—O. S. DUFFENDACK and R. A. WOLFE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 161–164. (E. G. V.)

Charcoals—Granulated Active, Comparison of. The properties of active carbon made from coconut shell, walnut shell and pine sawdust, and soaked in solutions of zinc chloride, phosphoric acid and potassium thiocyanate before activation, have been compared. The specimens are characterized by their ash content, apparent and true density, heat of wetting by water and organic liquids, porosity, surface and electrical conductivity. Examination of the adsorptive efficiency, using hydrogen, carbon dioxide and sulfur dioxide, shows that this is independent of the starting material, but increases in the order of zinc chloride less than phosphoric acid, less than potassium thiocyanate. The efficiency of carbon prepared by any one process increases with decrease in mineral content, but no relation exists between efficiency and ash content of differently treated specimens. Carbon activated after treatment with potassium thiocyanate is superior to the others in respect both of velocity of adsorption and of the quantity absorbed at equilibrium.—A. LOTTERMOSER and C. Y. TU. *Kolloid-Beihefte*, 46 (1937), 425; through *J. Soc. Chem. Ind.*, 57 (1938), 12. (E. G. V.)

Chemical Reactions and Extraction Processes—Carrying Out. Two liquids, or the liquid component of a mixture of liquid and gas, are/is vibrated as described in the prior patent. Conveniently, the vibrations are transmitted through a flexible membrane in the wall of the vessel.—W. W. GROVES. Brit. pat. 472,756; addition to Brit. pat. 457,552; through *J. Soc. Chem. Ind.*, 57 (1938), 4. (E. G. V.)

Chlorohydrin Production—Rapid Control of. An appliance for automatic registration of the conductivity (K) of the solution in the reaction of preparation of chlorohydrin (I) from ethylene and chlorine in water is described. In presence of excess of ethylene the K is due to hydrochloric acid, the content of which is proportional to that of I. Presence of excess of chlorine in the gas causes an abrupt rise in K, due to the formation of hypochlorous acid.—D. KOLLER. *Prom. Org. Kim.*, 4 (1937), 191; through *J. Soc. Chem. Ind.*, 57 (1938), 36. (E. G. V.)

Colloidal Solutions—Influence of Hydrogen-Ion Concentration on the Surface Tension of. A number of lyophilic systems were examined and the variation of surface tension with hydrogen-ion concentration found. Each system (ovalbumin, serum albumin, serum globulin, gelatin, ovarian cyst fluid, brilliant green) with the exception of casein, shows a minimum value of surface tension at the isoelectric point: all the systems, however, show a maximum rate of surface adsorption at this p_H. The exceptional behavior of casein may well be due to impurity and partial denaturation. It is shown that this surface tension p_H relationship may be used for the determination of the isoelectric points of certain lyophilic colloids, and was used to identity the major pro-

teins present in the fluid from an ovarian cyst.—P. W. PERRYMAN and C. F. SELOUS. *J. Physiol.*, 92 (1938), 151; through *Am. J. Pharm.*, 110 (1938), 153. (A. C. DeD.)

Distillation and Rectification Columns—Automatic Functioning of. The automatic regulation of continuously acting columns can be affected by two regulators, one controlling the steam supply (the pressure of which must also be regulated) and the other the ethyl alcohol discharge (coulage). These are best actuated in accordance with the temperature on the plates rather than with the pressure in the column. The temperature of certain intermediate plates is very sensitive to changes in working conditions, and thermometers installed on these plates can actuate the automatic regulators mentioned above. The system indicated is in use in 30 French distilleries.—G. GRIMAUD. *Bull. Assoc. Chim. Sucr.*, 54 (1937), 506; through *J. Soc. Chem. Ind.*, 57 (1938), 3. (E. G. V.)

Drying Materials in Trays. The tray drying of surface moisture from non-hygroscopic materials and the effects of various drying conditions on the constant drying rate have been studied. Two samples of Ottawa sand (20–30 and 50–70 mesh) were employed. The drying variables studied with the ranges covered were: air temperature, 115–300° F.; relative humidity of air, 10–60%; air velocity, 150–1375 feet per minute; material depth, 0.5–2 inches; and insulation of tray, none and 1-inch cork. The evaporation of water in trays under similar air conditions was also studied for comparison. In runs with sand, nearly all the water was removed during the constant rate period. The results obtained chiefly concern this period. The constant drying rate was found nearly identical for sand and water under the same drying conditions. This rate has been expressed in terms of either the heat transfer coefficient between the wetted material surface and air. The results indicate that these coefficients vary with approximately the 0.8 power of the air velocity over the range covered. However, the heat transfer coefficient is preferable from the standpoint of reliability and convenience of use. The coefficients for perfectly insulated trays based on experimental data, may be employed for the prediction of the constant drying rate of any similar material under any given drying conditions in an uninsulated tray. If the critical moisture content of the material is low, the rate so found will enable an approximate calculation of the total drying time.—G. B. SHEPHERD, C. HADLOCK and R. C. BREWER. *Ind. Eng. Chem.*, 30 (1938), 388–397. (E. G. V.)

Elutriation—Classification of Material by. Fine material and water are withdrawn by a siphon pipe from a large annular chamber above the inlet chamber. The inlets of feed are tangential and the middle and coarse sizes are washed by a jet of clear water causing a vertical motion, the middling being lifted up a central uptake by a propeller.—L. ANDREWS. Brit. pat. 472,258; through *J. Soc. Chem. Ind.*, 57 (1938), 6. (E. G. V.)

Ferric Sulfate—Electrolytic Reduction of, in Presence of Titanium Sulfate. II. Optimum conditions for reduction of ferric sulfate to ferrous sulfate in presence of titanium^{++} and sulfuric acid are: current density 3–4 amperes/square cm., at 2.74–3.1 volts and at 50° with an asbestos, and at 60° with a porcelain, diaphragm. The anolyte consists of 45–50% sulfuric acid.—K. J. GRATSCHER and S. I. REMPEL. *J. Applied Chem. Russ.*, 10 (1937), 1355; through *J. Soc. Chem. Ind.*, 57 (1938), 75. (E. G. V.)

Gums. Viscosity and measurement of same, gelatinization thixotropy, stringiness, steam orientation, emulsifying power, along with physical characteristics of gums and mucilages are described. Reasons for use of acacia and tragacanth in emulsions are given. An apparatus for testing uniformity of mucilages is described. Factors governing viscosity are stressed.—G. MIDDLETON. *S. P. C.* (March 1937), 216; through *Am. Perfumer*, 36 (1938), 64. (G. W. F.)

Liquors—Means for Aging. Alternating current is converted by a transformer with simple vibrating contact into a low-tension pulsating current which is applied to the liquor, one electrode being of coiled soft iron wire having large exposed surface.—J. O. and C. F. COFFMAN. U. S. pat. 2,061,960; through *J. Soc. Chem. Ind.*, 57 (1938), 77. (E. G. V.)

Mineral Oils—Photochemical Studies of. I. Photo-Oxidation of Mineral Oils. II. Absorption Spectra of Hydrocarbons and Mineral Oils. Degassed oils from various sources were exposed at room temperature to light from a 300- or 500-watt electric bulb and the amount of oxygen absorbed was measured. The apparatus and technic used are described. The rate of oxidation was proportional to the intensity of the light and the quantity of the light absorbed (time of irradiation). Darkening, preceded in some cases by slight lightening in color, occurred, and oxygenated compounds, carbon monoxide, carbon dioxide and water were formed. The

photo-oxidation of the oils decreased as the amount of sulfuric acid or activated clay used in refining was increased, and was only slightly inhibited by addition of small amounts of pyridine, thiophen, β-napthylamine, etc. Photo-oxidation affected the interfacial tension of the oils against water, especially in the case of Venezuelan oils. The absorption spectra of photo-oxidized oils differed from those of untreated oils only in the visible and ultraviolet regions.—E. VELLINGER. *Ann. Off. nat. Comb. liq.*, 12 (1937), 195; through *J. Soc. Chem. Ind.*, 57 (1938), 18. (E. G. V.)

Organic Substances—Drying of. In the drying of food a continuous circulation of drying medium is maintained; on leaving the goods chamber, part is chilled to condense out water and the dry, cold medium is remixed with the bulk with turbulence, the whole being reheated prior to reentering the goods chamber.—A. E. WIGELSWORTH. U. S. pat. 2,060,389; through *J. Soc. Chem. Ind.*, 57 (1938), 4. (E. G. V.)

Particle Shape. It is suggested that the idea that the quantity of material passing through a sieve in unit time is periodic should be investigated with sieves of various hole shapes, and that particle size should be expressed by vectors with the center of gravity, as origin.—H. H. STEPHENSON. *Chemistry and Industry*, 56 (1937), 726. (E. G. V.)

Refrigerating Medium. A hold-over "brine" or cold accumulator comprises 17–25% by weight of propyl alcohol in water with 0.1–0.2% of alkali chromate to prevent corrosion.—B. E. TIFFANY. U. S. pat. 2,058,924; through *J. Soc. Chem. Ind.*, 57 (1938), 5. (E. G. V.)

Sterilizing Apparatus. Automatic means for creating a vacuum, admitting a heated organic substance, and re-admitting air are described.—A. U. ALCOCK. Brit. pat. 473,338; through *J. Soc. Chem. Ind.*, 57 (1938), 5. (E. G. V.)

Vapor Pressure of Solvents. Nomographic charts are given for the following liquids: acetone, 1-bromo-1-chloroethane, butyraldehyde, carbon disulfide, carbon tetrachloride, chloroform, chloroprene, 1,1-dichloroethane, 1,2-dichloroethane, dichloroethylene (cis), dichloroethylene (trans), dichloromethane, ethanol, ethyl acetate, ethyl bromide, ethyl chloride, ethyl ether, ethyl formate, ethyl methyl ketone, ethylene oxide, isopropanol, isopropyl acetate, isopropyl ether, methanol, methyl acetate, methyl formate, methyl iodide, methyl propyl ether, propylene oxide, 1,1,1-trichloroethane, trichloroethylene, vinyl acetate, acetal, acetic anhydride, isoamyl acetate, *n*-butyl acetate, isobutyl acetate, *n*-butyl alcohol, isobutyl isobutyrate, isobutyl propionate, "cellosolve," crotonaldehyde, 1,2-dibromoethane, 1,3-dichloro-2-butene, dioxane, 2-ethyl butyl alcohol, ethyl *n*-butyrate, ethyl propionate, ethylene chlorohydrin, ethylene diamine, mesityl oxide, methyl amyl acetate, methyl amyl alcohol, methyl *n*-butyrate, methyl isobutyrate, methyl "cellosolve," methyl "cellosolve" acetate, methyl isobutyl ketone, monochlorobenzene, *n*-propyl acetate, *n*-propyl ether, propylene chlorohydrin, propylene dichloride, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane.—D. H. KILLEFFER. *Ind. Eng. Chem.*, 30 (1938), 477–479. (E. G. V.)

Viscosity Problems—Graphical Solutions of. A new chart is described which enables viscosity to be readily transposed into other units at other temperature and viscosity index, properties and proportions of blends, S. A. E. numbers, Ubbelohde pole heights and viscosity-temperature indices to be read off if viscosity at two temperatures is known. A specimen of the chart and full instructions as to its use are given.—*Inst. Mech. Eng.* (Oct. 1937), Suppl., 37–44; through *J. Soc. Chem. Ind.*, 57 (1938), 23. (E. G. V.)

Water and Ethyl Alcohol—Distillation of Mixtures of. No simple formula relates x and y, the weight-% of ethyl alcohol in the liquid and vapor phases. For values of x between 0 and 95.5 (the azeotropic point), however, $dy/dx = f(x)$ approximates closely to a hyperbola. Integrating and determining the constants by experiment, the author obtains $y = 0.0116945x^2 - 1.95329x + 125{,}652\log(1 + x/4)$, which for $x = 0$ to 95.5 gives values of y between those of Sorel and Bergström.—P. VIDAL. *Bull. assoc. chim. sucr.*, 54 (1937), 489; through *J. Soc. Chem. Ind.*, 57 (1938), 96. (E. G. V.)

INORGANIC

Boric Acid—Purifying. Commercial grade boric acid is purified by recrystallizing it from an aqueous solution thereof containing a small proportion of a strong inorganic acid.—FRANTZ F. BERG, assignor to E. R. SQUIBB AND SONS. U. S. pat. 2,113,248, April 5, 1938. (A. P.-C.)

Boric Acid—Sensitive Reaction for. Boric acid is detected by a 0.05% carmine red solution in concentrated sulfuric acid, which changes from red to blue in the presence of boric acid. The sensitivity of the test is 0.0001 mg. of boron in 0.03 cc. The test is applicable to natural salt solution and minerals. The reaction is probably due to the formation of an inner-complex ester of boric acid.—F. P. ZORKINE. *J. Prikl. Khim.*, 9 (1936), 1505–1506; through *Chimie & Industrie*, 39 (1938), 446. (A. P.-C.)

Carbon Monoxide—Determination of Low Concentrations of. Examination of the reaction between carbon monoxide and palladium chloride has led to the development of a modified quantitative test based on this reaction. The new method requires only a small volume of gas and several determinations can be made together in a little more time than is required for a single one. The error of the test is of the same order as that of the iodine pentoxide method.—ANON. *J. Soc. Chem. Ind.*, 57 (1938), 79–82. (E. G. V.)

Cyanides in Water—Detection and Determination of. The sensitivities and sources of error of the phenolphthalein, Prussian-blue, thiocyanate, picrate and Fox's silver iodide tests for determining cyanides are discussed; Fox's test was chosen as the most satisfactory for qualitative purposes. Sharwood's method for direct determination of soluble cyanides is described. Water should be free from cyanide, but in very exceptional cases, where it occurs intermittently, 10 parts per million of potassium cyanide should afford an ample safety for humans, horses, cattle and dogs, and can be easily detected and determined.—R. A. GREENE and E. L. BREAZEALE. *J. Am. Water Works Assoc.*, 29 (1937), 1971–1977; through *J. Soc. Chem. Ind.*, 57 (1938), 325. (E. G. V.)

Fluorine—New Spectrographic Method for Detecting. The method is based on the detection of the silicon spectrum in a melt of lead-boron glass. Crucible-like shapes of this glass are prepared, and silicon tetrafluoride, obtained with sulfuric acid and quartz sand from the sample, is absorbed in a few drops of potassium hydroxide placed in the crucible. After the evolution of silicon tetrafluoride from the fluorine-containing substance is complete, the crucible and content (potassium hydroxide with absorbed silicon tetrafluoride) are melted in a platinum container. The silicon distributes itself homogeneously in the melt. The silicon spectrum is then obtained by interpolation between the spectra of two potassium-containing lead-boron glasses. The method permitted the determination of as little as 0.04 to 0.05 mg. of silicon, corresponding to 0.11 to 0.12 mg. of fluorine.—W. DAUBNER. *Angew. Chem.*, 49 (1936), 830–831; through *Chimie & Industrie*, 39 (1938), 447. (A. P.-C.)

Inorganic Salts—Determination of, in Crude Oils. Into a 750- or 1000-cc. separatory funnel put 100 cc. of the crude oil, 100 cc. of xylene and 4 cc. of a 5% xylene solution (or the equivalent if other than a 5% solution is used) of Destabilizer A. Shake for 30 seconds and add 100 cc. of boiling, chloride free, distilled water. Stopper the funnel and shake, releasing the pressure occasionally at first, for a total time of 5 minutes. Then allow to stand. Break up any loose emulsion that may collect at the oil-water interface by gentle agitation with a long stirring rod. Draw off as much of the aqueous layer as is required for analysis, filter to remove any oil film and analyze the measured portions of the extract by conventional methods. When the salt content of an oil is low, it is advisable to extract larger samples of oil, using proportionately larger amounts of xylene, water and destabilizer.—C. M. BLAIR. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 207. (E. G. V.)

Lead—Determination of, in Drinking Water. A colorimetric method for determining lead in drinking water and lead sulfide is described.—HOLL. *Boll. chim.-farm.*, 76 (1937), 654–656; through *J. Soc. Chem. Ind.*, 57 (1938), 325. (E. G. V.)

Phosphate—Determination of, in the Presence of Interfering Substances. Colorimetric phosphate determinations are often difficult or impossible because of interfering substances. In these cases it is convenient to precipitate the phosphate away from the interfering substance and to determine it colorimetrically in the redissolved precipitate. It is impossible to precipitate the phosphate as a phospho-molybdate in the presence of reducing substances such as ascorbic acid, which reduces the phospho-molybdate. It has been found possible completely to precipitate the inorganic phosphate as calcium phosphate in amounts as small as 0.01 mg. phosphorus, by entrainment on light magnesia powder (magnesium carbonate). The centrifuged precipitate is dissolved in perchloric acid and the colorimetric determination carried out in the regular way.—G. E. DELORY. *Chemistry and Industry*, 57 (1938), 277. (E. G. V.)

ORGANIC

Alkaloids

Ammodendron Conollyi—Alkaloids of. Constitution of Ammodendrine. Ammodendrine $C_{12}H_{20}ON_2$ (I), obtained from the leaves of *Ammodendron Conollyi*, yielded on catalytic hydrogenation dihydroammodendrine, $C_{12}H_{22}ON_2$ (II), which gave acetic acid and 2,3′-bipiperidine on alkaline hydrolysis. As *N*-methyldihydroammodendrine yielded on hydrolysis a *N*-methyl-2,3′-bipiperidine, identical with that obtained by the hydrogenation of racemic *N*-methylanabasine, the constitution of II was established as 1′-acetyl-2,3′-bipiperidine. As to the constitution of I the position of the double bond present in its molecule is not yet established.—A. OREKHOFF and N. PROSKOURNINA. *Bull. soc. chim., mem.* [5], 5 (1938), 29; through *Squibb Abstr. Bull.*, 11 (1938), A-346. (F. J. S.)

Ergocristine and Ergocristinine—New Alkaloidal Pair from Ergot. By careful working up of the alkaloids of Spanish and Portuguese ergot, S. and B. obtained a new complex (I), resembling ergoclavine, but differing in optical activity and in elementary composition from the hitherto described complex ergot alkaloids. I, containing ergosinine and the new alkaloid ergocristine (II), was obtained from the mother liquor after crystallization of ergotoxine (III), and was decomposed by methyl alcohol or acids into its components. When II was refluxed 6 hours with methyl alcohol it yielded its isomer, ergocristinine (IV). II and IV possessed the same empiric formula as III and ergotinine (V), $C_{35}H_{35}O_5N_5$, and resembled them in optical activity, but differed from III and V in crystal form, solubility and pharmacological activity. IV and V were readily differentiated by boiling with 1% alcoholic phosphoric acid, since IV gave a precipitate while V did not. II, $[\alpha]_D -186°$, was more active pharmacologically than IV, $[\alpha]_D +365°$. II was readily crystallized either as the free base or as salts, while IV did not form stable salts and was readily converted to II.—ARTHUR STOLL and ERNST BURCKHARDT. *Z. physiol. Chem.*, 250 (1937), 1; through *Squibb Abstr. Bull.*, 11 (1938), A-173. (F. J. S.)

Ergot Alkaloids—Microscopic Investigation of. I. Ergotamine and Ergotaminine. Addition products of ergotamine with acetone, water, ethanol, methanol, pyridine, benzene, dichloroethylene and ether were prepared and examined crystallographically. These molecular combinations were prepared through action of the solvent on solvent-free ergotamine, whereby the addition product appears as a precipitate. Only the water compound requires a further medium for attaining well-developed crystals, which functions as solvent for both components. Crystals of the water compound can also be prepared through direct action of water, by warming, on other ergotamine combinations. All these molecular combinations (except those with ether, with which no estimation was possible) crystallize in the sphenoidal class. Since they are all optically active substances, this behavior is understandable in accordance with Pasteur's law, whereby all optically active substances must crystallize in one of 11 symmetry classes, which possess no symmetrical plane. All these compounds have no true melting point, but apparently melt under decomposition. On the heating table, certain combinations, *e. g.*, those with acetone, water, pyridine, dichloroethylene and benzene, lose when warmed a portion at least of their volatile components, as indicated by the change in double refraction. The melting points of these compounds lie between 170° and 185° C. The compounds with ethanol and methanol seem to be especially stable, since on warming no change in optical relations is discernible. The decomposition point of both substances lies between 208° and 210° C. Ergotaminine crystallizes without crystal media from pyridine, acetone, chloroform, alcohol and dichloroethylene, in homogenous leaflets, which have the form mostly of triangles and deltoids.—A. KOFLER. *Arch. Pharm.*, 274 (1936), 398–414; through *Chimie & Industrie*, 38 (1937), 930. (A. P.-C.)

Ergot Alkaloids. XIII. The Precursors of Pyruvic and Isobutyryl-Formic Acids. Hydrogenation of ergotinine (I) in acetic acid with platinum oxide catalyst followed by alkaline hydrolysis of the hydrogenation product yielded isobutyrylformic acid (II) in approximately the same yield as previously obtained by alkaline hydrolysis of I itself, and gave no detectable α-hydroxyisovaleric acid (III). As a control, II itself was hydrogenated under similar conditions and was found to be reduced readily and quantitatively to III. Thus either II when combined as such in the alkaloid cannot be catalytically reduced, or II is formed from a precursor during hydrolysis. The latter theory is supported by the finding that no nitroprusside test for pyruvic acid (IV) is given by ergotamine (V) or ergotaminine (VI) or the hydrogenation products of V and VI, while a strong

test for IV is given by the alkaline hydrolysis products of V and VI or the alkaline hydrolysis products of their hydrogenation products. The most satisfactory explanation for these observations is that the precursor of II in the pair I-ergotoxine is α-hydroxyvaline and that of IV in V–VI is α-hydroxyalanine. The results are discussed in relation to the structure of the various ergot alkaloids.—WALTER A. JACOBS and LYMAN C. CRAIG. *J. Biol. Chem.*, 122 (1938), 419; through *Squibb Abstr. Bull.*, 11 (1938), A-369. (F. J. S.)

Ergot Question—Present Status of. This review summarizes the papers dealing with ergot which appeared since 1931. The chemistry and pharmacology of the newer alkaloids (of ergot) is compiled and summarized. No mention is made of the large number of papers in which ergotoxine or ergotamine have been used as tools of research, nor are the clinical uses discussed.—E. E. NELSON and H. O. CALVERY. *Physiol. Rev.*, 18 (1938), 297; through *Am. J. Pharm.*, 110 (1938), 205. (A. C. DeD.)

Heliotropium Lasiocarpum and Trichodesma Incanum—Alkaloids of. The alkaloids heliotrine, $C_{16}H_{27}NO_5$, and lasiocarpine, $C_{21}H_{33}NO_7$, from *Heliotropium lasiocarpum*, and trichodesmine, $C_{18}H_{27}NO_6$, from *Trichodesma incanum* are tertiary bases and esters. Hydrolysis of heliotrine gives the amino-alcohol, heliotridrine and a fatty acid, heliotrinic acid, $C_8H_{16}O_4$. Similarly, lasiocarpine is decomposed to heliotridrine, angelic acid and lasiocarpinic acid, $C_8H_{16}O_5$; and trichodesmine yields an isomer of heliotridrine, trichodesmidine, *dl*-lactic acid and isobutyl acetate formed by the ketonic decomposition of either α-isopropylacetylacetic or isovalerylacetic acid. Catalytic reduction of heliotridrine and trichodesmidine gives the saturated amino alcohols, hydroxyheliotridane, $C_8H_{15}NO$, and hydroxytrichodesmidane, which lose a molecule of water on heating with concentrated sulfuric acid to form unsaturated bases, $C_8H_{13}N$, reduced catalytically to the same saturated base, heliotridane, $C_8H_{15}N$. The dehydrogenation of heliotridane does not yield pyridine bases and it is presumed that heliotridane has a pyrrolizidine nucleus with a methyl group in the 1-position which may be confirmed by the synthesis of 1,3-dimethyl-2-propyl-pyrrolidine.—G. MENCHIKOV. *Izvest. Akad. Nauk S. S. S. R. (Sér. Chim.)*, (1936), 969–981; through *Chimie & Industrie*, 38 (1937), 930. (A. P.-C.)

***l*-Nornicotine and *d*-Nornicotine—Synthesis of.** The alkaloid *l*-nornicotine was found to be the more important of the alkaloids of nicotine, not only because it is found together with *l*-nicotine in the ordinary tobacco, but also because it is found to be the principal constituent of the German tobacco, where it occurs to the extent of about 2%. The synthetic racemic nornicotine was obtained by means of *l*- and *d*-6,6′-dinitro-2,2′-diphenic acid at which time the optical active form of the compound was split up.—E. SPATH and F. KETSLER. *Ber.*, 69 (1936), 2725; through *Chem. Zentr.*, 108 (1937), 1442. (G. B.)

Senecio—Species of, Alkaloids of. The hydrolysis of platiphylline yields the amino alcohol, platynecine, $C_8H_{15}NO$, and platynecinic acid, $C_{10}H_{16}O_4$. Platynecine contains 2 hydroxyl groups in the γ- or δ-position and forms a dibenzyl derivative, $C_8H_{13}N(OBz)_2$, and a dichloride $C_8H_{13}HCl_2$. Elimination of water from platynecine leads to an oxide, $C_7H_{13}NO$. By Hofmann degradation it has been established that the nitrogen atom is situated at the intersection of the two heterocyclic nuclei. Reduction of platynecine dichloride gives heliotridane, $C_8H_{15}N$, previously obtained from the alkaloids heliotrine, lasiocarpine and trichodesmine obtained from the *Boraginaceæ* and thus establishing a connection between these alkaloids and those of the species *Senecio*.—R. A. KONOVALOVA. *Izvest. Akad. Nauk S. S. S. R. (Sér. Chim.)*, (1936), 961–967; through *Chimie & Industrie*, 38 (1937), 930. (A. P.-C.)

Tobacco—New Alkaloids of. Contrary to the method used by other investigators in isolating the nicotine bases from the tobacco liquor, the authors used utmost precaution to prevent racemization and decomposition. The purification of the derivatives obtained was accomplished through fractional distillation; the light volatile base was reacted with nitrogen at 15–20°; the dried chlorhydrated compound was then reacted with chloroform. The ammonium chloride being insoluble, separated out and the chlorhydrate of the secondary and tertiary base remained in solution. The separation of these bases was accomplished by using *p*-toluolsulfochloride when the sulfamide of the secondary base was formed. From the last-named compound, crystals of *p*-toluolsulfonicacidpiperidid separated out; m. p. 96–98°. This product was identical with the derivative which is obtained when piperidin is reacted with *p*-toluolsulfochloride. A small portion of the *p*-toluolsulfamide did not crystallize out so that another method of isolation had to be employed. From the tertiary base, a compound was separated (trimethylamine) which was iden-

tified as a picronolate. The small yield which separated out at 120–140°, was mixed and shaken with acids and yielded a weak base whose picrate was identified as the dipicrate of 2,3-dipyridyl; the trinitro-*m*-cresolate of the two bases melts separately and also collectively at 190–191°. The supposition of other investigators that active peganin can be isolated from *Peganum harmala* was not verified by the authors as no sample of the plant was available. Nevertheless the authors isolated peganin from *Adhatoda vasica* Nees and with careful treatment obtained it in a form which was optically active. The compound *l*-peganin which was obtained from *Peganum harmala* by other investigators is identical with the compound which was obtained by the authors from the plant *Adhatoda vasica* N.—E. SPATH and E. ZAJIC. *Ber.*, 69 (1936), 2448; through *Chem. Zentr.*, 108 (1937), 881. (G. B.)

Veratrum Album—Alkaloids of. II. The Individual Alkaloids and Their Relationship: Protoveratridine, Germerine, Protoveratrine. Analyses of the hydrochloride, picrate, chlorplatinate and chloraurate of protoveratridine indicate the formula $C_{31}H_{49}O_9N$, while analyses of the salts of germerine and molecular weight determination indicate for it the formula $C_{36}H_{57}O_{11}N$. Both gave the same red coloration and butyric odor with concentrated sulfuric acid. Saponification of protoveratridine with alcoholic lye yielded a crystalline base $C_{26}H_{41}O_8N$ and an optically active valeric acid—*lævo* methyl ethyl acetic acid—while hydrolysis of germerine yielded the same crystalline base (germine), the same valeric acid and also methyl ethyl glycollic acid. Germine sinters at 160–170° C., and melts at 220° C., is less soluble in hot than in cold water, is not precipitated by the addition of ammonia or picric acid, nor by Mayer's reagent unless in concentrated solution. Hydrogen peroxide oxidizes it to an amine oxide, m. p. 249° C. It crystallizes from water, methanol, ethanol, acetone or chloroform. It is dextro-rotary and in alcohol has a specific rotation $[\alpha]_D^{20} = +4.8°$. It has a marked similarity to cevine, $C_{27}H_{43}O_8N$, the hydrolytic product of cevadine, another constituent of veratrine. A Zerewitinoff determination and acetylization indicate the presence of five hydroxyl groups in germine. Analyses of hydrochloride, hydrobromide, hydroiodide, hydrorhodanide, picrate and chloraurate indicate the formula $C_{40}H_{63}O_{14}N$ for protoveratrine. Hydrolysis with alcoholic lye yielded three acids: acetic, lævo methyl ethyl acetic and methyl ethyl glycollic; and a base protoverine, $C_{28}H_{45}O_{10}N$ which could not be crystallized or obtained pure. Protoveratrine is a tertiary base with five active hydrogens and with no methoxy or methylenedioxy groups.—W. POETHKE. *Arch. Pharm.*, 275 (1937), 571. (L. L. M.)

Essential Oils and Related Products

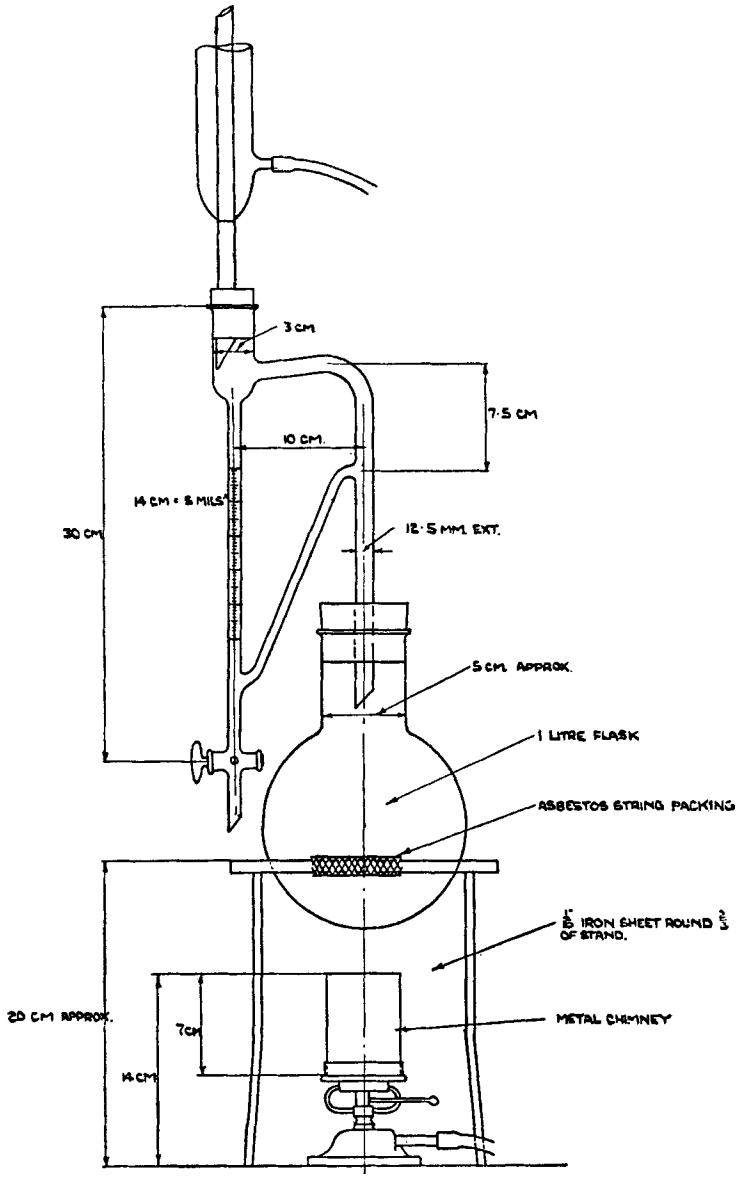
Essential Oils—Determination of, in Their Alcoholic Solutions. The volumetric method of Kaiser and Fürst for the determination of oil of anise and other essential oils in alcoholic solution has been retested and found unreliable. In the author's proposed method the oil is salted out and determined gravimetrically. Place about 200 mg. of the sample in a separatory funnel and weigh by difference; add 80 cc. of 30% ammonium sulfate and shake vigorously; filter the aqueous layer through 1 Gm. of norite, rinsing the separatory funnel twice with 5 cc. of ammonium sulfate; transfer the filter and norite back to the funnel, add 15 cc. of ether, dry with anhydrous sodium sulfate by vigorous shaking and filter into a tared flask containing liquid paraffin, rinsing the funnel with ether. Dry the flask at 40° C., then in a desiccator with quick lime, and weigh.—H. J. VAN GIFFEN. *Pharm. Weekblad*, 73 (1936), 641–647; through *Chimie & Industrie*, 38 (1937), 103. (A. P.-C.)

Essential Oils—Production of, in Belgian Congo. Analyses of geranium oils from the Belgian Congo show that the product compares favorably with those from Algeria and Reunion. The export of various oils from the Congo is discussed.—G. GOETHALS. *Natuurwetensch. Tijds.*, 19 (1937), 233–236; through *J. Soc. Chem. Ind.*, 57 (1938), 225. (E. G. V.)

Lavender Oil—Italian, New Sources of. Analytical data are given for oils from *Lavandula officinalis* grown in Salerno and Perugia.—V. MASSERA. *Boll. chim.-farm.*, 76 (1937), 531; through *J. Soc. Chem. Ind.*, 57 (1938), 104. (E. G. V.)

Matricaria—Oil of. A discussion of the production and use of matricaria and the essential oil obtained therefrom. The flowers yield 0.3 to 0.78%; German flowers yield considerably more than the Hungarian. About 27% of the oil dissolves in the distillation water. Oil obtained from chamomile "dust" has a higher congealing point (22° C.) than that from the flowers (3° C.). The characteristics of the two samples of genuine oil of *Matricaria chamomilla* were: specific gravity at

15° C., 0.919 and 0.924; acid value, 36.5 and 35.0; saponification value, 43.9 and 42.9; soluble in 0.5 volumes or more of 90% alcohol, at 20° C. with separation of paraffin. The constituents were discussed in detail: azulene, sesquiterpenes "B" and "C," sesquiterpene alcohols, paraffins, umbelliferone methyl ether (methoxy cumarin), a fatty acid and furfural. The oil is used in perfumes and cosmetics. Its inflammatory action is discussed.—ERNEST GUENTHER. *Am. Perfumer*, 35 (1937), 45, 46; 36 (1938), 54–56. (G. W. F.)



Volatile Oil Extractor.

Oil of Bitter Almond—Chemistry of. A discussion of the botanical origin of almond oil together with a description of the tree and the chemical aspects of oil of almond including the hydrolysis of the glucoside, the method of obtaining the oil commercially, test for hydrocyanic acid—ferrocyanide test and copper-benzidine test (blue coloration produced when a mixture of aqueous solutions of copper acetate and benzidine acetate are added to the oil). The constants for bitter

almond oil and almond oil free from prussic acid (by precipitation with lime and ferrous sulfate) are: specific gravity 20°/4°, 1.045–1.070 and 1.050–1.055, respectively; refractive index at 20°, 1.532–1.544 and 1.540–1.546, respectively; optical rotation, 0°–0°10′ and 0°–0°10′, respectively. Natural oil of almond is superior to synthetic benzaldehyde because of small amounts of other constituents which exert their effect in dilute solutions. Almond oil is used as a synthetic flavor for apricot, peach and cherry; it is popular in soaps, lotions and other cosmetics.—V. G. FOURMAN. *Am. Perfumer*, 35 (1937), 41, 91–92. (G. W. F.)

Oil of Coriander Seed. A discussion of the growth, production, chemistry and physical properties of oil of *Coriandrum sativum* L. The constants were found to be: specific gravity (15° C.) 0.870–0.885, usually not higher than 0.878; optical rotation 8° to 13°; refractive index (20°) 1.463–1.471; acid number up to 5; ester number 3 to 22.7; soluble in 2 to 3 volumes of 70% alcohol at 20° C. The chemical constituents are reviewed and discussed.—ERNEST GUENTHER. *Am. Perfumer*, 35 (1937), 45–47; 91–92. (G. W. F.)

Orange Oil. The opalescent substance of California orange oil terpene fractions had a boiling range of 150° to 180°. It was not methyl anthranilate and remains unidentified.—R. FORNET. *Seifensieder Ztg.*, 63 (1936), 1043; through *Am. Perfumer*, 36 (1938), 64. (G. W. F.)

Terpeneless Oils. A new method utilizing pentane and alcohol as extractives is described. It is expected that alcohols of citronella oil will be separated in this way.—VAN DIJCK and RUYS. *Perfumery Essent. Oil Record*, 28 (1937), 91; through *Am. Perfumer*, 35 (1937), 46. (G. W. F.)

Volatile Oils—Determination of, in Drugs. Various methods are reviewed. The apparatus shown on page 357 has been found to be convenient and satisfactory. Results are given of experiments designed to minimize the loss of volatile oil involved in grinding the material, and the value for this purpose of using a mixture of glycerin and water in the distilling flask are shown. The percentages of volatile oil yielded by some commercial powders and unground drugs are recorded.—H. O. MEEK and F. G. SALVIN. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 471–485. (S. W. G.)

Glycosides, Ferments and Carbohydrates

α-Amylase—Action of, on Starches. The action of amylases upon amylo-amyloses, Lintner starch erythro-amylose and amylo-dextrine was investigated. The amylo-compounds were broken down more quickly at first by α-amylase than were the erythro-compounds. With β-amylase the reverse was the case. The slowing off of the hydrolysis occurred at lower sugar concentrations the richer the starch was in erythro-substance. The residue not converted into sugar was greater the greater the content of erythro-substance in the substrate.—M. SAMEC. *Hoppe-Seyler's Z.*, 248 (1937), 117; through *Physiol. Abstr.*, 22 (1937), 1014. (F. J. S.)

Bergenia Cordifolia—Chemical and Biochemical Study of. Monthly Variations of Glycosidal Principles. *Leaves.*—Free reducing sugars increase slightly in May (0.75%) and July (0.71%) and increase greatly in October (1.00%) and November (1.60%). Reducing sugars liberated by invertin pass through minima in May (0.39%) and July (0.34%), and then increase in October (1.00%) and November (1.63%). Reducing sugars appearing after treatment with emulsin are low in May (0.25%), June (0.22%) and July (0.20%); increase in August (0.83%) and September (1.10%); then decrease in October (1.03%) and November (0.88%). The glycoside arbutoside was isolated and identified.—G. LAGRANGE. *J. pharm. Belg.*, 19 (1937), 735–739, 751–754. (S. W. G.)

Cornus Mas L.—Glycosidal Variations in, during a Year's Growth. Free reducing sugars show peaks in Dec. (1.48%), Feb. (1.54%), June (1.19%) (plant matures) and Sept. (1.08%) (fruits mature). A sharp drop is noted from June to August (0.59%). The holosides (liberated by invertin) decrease slightly from Dec. (0.72%) to June (0.28%), then increase through September and October (0.89%), dropping in November (0.71%). The heterosides (liberated by emulsin) vary slightly with maxima in April and May of 0.2%. The results are compared with those observed with *Cornus sanguinea* L.—NIHOUL-GHENNE. *J. pharm. Belg.*, 19 (1937), 767–771, 785–787. (S. W. G.)

Heavy Water—Effect of, on the Hydrolysis of Urea by Urease. At 25° ammonium carbamate is completely hydrolyzed in water or D_2O in one hour, whether or not urease is present. The conversion of ammonium cyanate into urea proceeds equally rapidly in water and D_2O, whether or not urease is present, but the hydrolysis of urea by urease proceeds much more rapidly in water (H_2O) than in D_2O, possibly because D_2O inhibits the interaction of substrate and enzyme or be-

cause decomposition of the enzyme substrate compound is catalyzed by D. less than by H.—W. BRANDT. *Biochem. Z.*, 291 (1937), 99; through *Physiol. Abstr.*, 22 (1937), 1019. (F. J. S.)

Hemicelluloses. III. Extraction and Preparation. When hot alcoholic sodium hydroxide is used as a pretreatment before hemicellulose extraction, it must be shown analytically that the furfuraldehyde-yielding constituents have not been attacked. Extensive removal of hemicellulose material is effected by extraction with cold 4% sodium hydroxide, alternated with brief chlorination. Such extracts may contain a high proportion of polysaccharides derived from cellulose. Brief extraction with hot, more dilute alkali has less drastic effect on the cellulose, and such extracts may consist largely of polyuronide hemicellulose. The lignin content of the hemicellulose preparations should always be determined; it may be reduced by brief treatment with chlorine and thorough washing with alcohol of moderate concentration.—A. G. NORMAN. *Biochem. J.*, 31 (1937), 1579; through *Physiol. Abstr.*, 22 (1937), 1018. (F. J. S.)

Nitrates—Rôle of, in Biological Oxidations. In dehydrogenations for which the only H acceptors are O_2 and NO_3', NO_3' is converted into NO_2', which oxidizes leucomethylene blue (I) or reduced flavin. Hence I is anærobically oxidized by NO_3' in the presence of *B. coli* and H donator (*e. g.*, lactate, glucose).—E. AUBEL. *Enzymologia*, 4 (1937), Part II, 51; through *Physiol. Abstr.*, 22 (1937), 1025. (F. J. S.)

Pancreatic Lipase—Action of Sodium Salts of Organic Acids on. Pancreatic lipase is not appreciably activated by sodium acetate, sodium *n*-butyrate, sodium *n*-valerate, sodium benzoate, sodium oxalate, sodium tartrate, citrate, malonate, glutarate, suberate, azelate or sebacate, but is slightly activated by sodium myristate, palmitate and stearate, and greatly activated by sodium oleate.—E. TRIA. *Enzymologia*, 3 (1937), 12; through *Physiol. Abstr.*, 22 (1937), 1023. (F. J. S.)

Pepsin—Crystalline, Multiple Nature of. The behavior of crystalline pepsin (prepared by Northrop's method) in Theorell's cataphoresis apparatus indicates that it consists of at least two proteins.—G. ÅGREN and E. HAMMARSTEN. *Enzymologia*, 4 (1937), Part II, 49; through *Physiol. Abstr.*, 22 (1937), 1025. (F. J. S.)

Pepsin—Evaluation of, and Its Preparations. Neither viscosity measurements alone nor titration values can afford unequivocal conclusions respecting the quality of pepsin preparations. Even in the application of one and the same preparation in varying concentrations different digestive values result. It appears possible, however, that estimation of viscosity / titration value may yet yield a serviceable measure for the evaluation of peptic activity.—H. ESCHENBRENNER. *Pharm. Ztg.*, 81 (1936), 790–792; through *Chimie & Industrie*, 38 (1937), 100–101. (A. P.-C.)

Pepsin and Pepsinogen—Immunological Studies on. A study was made of the seriological reactions of the pepsin from several different species of animals and of pepsin and pepsinogen. Pepsins from swine, cattle and guinea pig precipitate in swine pepsin antiserum, but those from the rabbit, chicken and shark do not. Pepsin antisera react with both pepsin and pepsinogen, but not with serum proteins of homologous species. Pepsinogen antisera react only with pepsinogen. Antisera from serum proteins do not react with the homologous pepsin or pepsinogen.—C. V. GEASTONE and R. M. HERRIOTT. *J. Gen. Physiol.*, 20 (1937), 797; through *Physiol. Abstr.*, 22 (1937), 1028. (F. J. S.)

Peroxidase and Phenolase—Photometric Determination of. Willstätter's procedure is improved by using a photometer in place of a colorimeter and clarifying the ether solution of purpurogallin with 2–4 volume % of alcohol.—L. BARTA. *Biochem. Z.*, 293 (1937), 228; through *Physiol. Abstr.*, 22 (1937), 1028. (F. J. S.)

Phosphatides—Component Fatty Acids of, of Soy Bean and Rape Seeds. The fatty acids of the phosphatides of soy bean and rape seed are qualitatively identical with those present in the glycerides of soy bean and rape seed. Linoleic acid predominates in the soy bean glycerides and phosphatides and in the rape seed phosphatides, while erucic acid predominates in the rape seed glycerides. Detailed analyses are presented.—THOMAS P. HILDITCH and WILLIAM H. PEDELTY. *Biochem. J.*, 31 (1937), 1964; through *Squibb Abstr. Bull.*, 11 (1938), A-98. (F. J. S.)

Racemiase, an Enzyme Which Catalyzes Racemization of Lactic Acids. Among thirty kinds of micro-organisms tested *Staphylococcus ureæ* alone produced racemiase. *Leuconostoc* (*l*-former) and *Lactobacillus plantarum* (*dl*-former) always produced specific forms of lactic acid, but remarkable modifications of the optical properties of fermentation lactic acids were observed with *Lactobacillus sake* (*d*-, *dl*- and *dl* + *d*-formers) when the conditions of cultivation were varied.

It is suggested that this modification of the form of the fermentation lactic acid is due to the presence of racemiase in the bacterial cells.—H. KATAGIRI and K. KITAHARA. *Biochem. J.*, 31 (1937), 909; through *Physiol. Abstr.*, 22 (1937), 1016. (F. J. S.)

Rhamnose—Fermentation of. *Bacterium rhamnosifermentans* decomposes rhamnose with the production of propylene glycol (1 mol. per mol. of rhamnose), formic, acetic and succinic acid. Equimolecular amounts of carbon dioxide and hydrogen are also produced. A possible mechanism for the degradation is suggested.—A. J. KLUYVER and C. SCHNELLEN. *Enzymologia*, 4 (1937), Part II, 7; through *Physiol. Abstr.*, 22 (1937), 1025. (F. J. S.)

Saponin, Æsculus and Its Nonsugar Constituents. The saponin was obtained either by the precipitation from the alcoholic extract of horse chestnut seeds by ether or by the fractional freezing of a saturated solution of the saponin in 96% alcohol. It was found that æsculus saponin does not form a single compound and that all æsculus saponins are built on a nonsugar basis common to all the saponins. The melting point of æsculus saponins is 174° to 206° C. Æsculus saponin cannot be acetylated because in the process of acetylation it is hydrolyzed. On warming the alcoholic solution of the saponin or prosapogenin with 6% sulfuric acid for 100 hours, there was obtained escigenin which was separated from nonhydrolyzed prosapogenin by changing the escigenin into the potassium salt and extracting it with chloroform and alcohol (10:1). By acetylation there was obtained the acetyl derivative of escigenin, the formula of which is $C_{35}H_{54}O_3(CH_3CO)_4$. There was prepared also the phenylhydrazone of escigenin, the formula of which is $C_{35}H_{59}O_4(NNHC_6H_5)_3$, so that the formula of escigenin is $C_{35}H_{54}(CO)_3(OH)_4$, and its molecular weight is 590.46.—E. BURES and F. VOLAK. *Časopis Českoslov. Lékárnictva*, 17 (1937), 21–27, 41–50; through *Chimie & Industrie*, 38 (1937), 929. (A. P.-C.)

Saponin from the Hulls of Gleditschia Horrida, Makino. The saponin was extracted from the drug with methanol, purified by usual methods and hydrolyzed by 5% alcoholic hydrochloric acid. The sapogenin was taken up in ether and shaken with 10% potassium hydroxide. The potassium salt, insoluble in both ether and aqueous potassium hydroxide, was separated, liberated by hydrochloric acid and again taken up in ether. The purified sapogenin exhibited: m. p. 299–300°; $[\alpha]_D^{20}$ + 32.5° in acetone; soluble in methanol and ethanol; intensive red-purple Liebermann reaction; insoluble in camphor; molecular weight by titration 473. It does not add bromine, nor hydrogen with platinic oxide. Neither a crystalline brom- nor an acetyl-lactone was obtainable. Consequently gleditschia-sapogenin differs from hederagenin in lacking a reactive double bond, and, unlike ursolic acid, is stable to hot alcoholic potassium hydroxide. CH_2N_2 gives mono-methyl ester $C_{30}H_{47}O_4\ CH_3$, m. p. 230.5°. The diacetate, m. p. 219°, shows a molecular weight of 540 by titration. Accordingly, the sapogenin is an isomer of hederagenin, siaresinolic acid and sumaresinolic acid.—S. KUWADA. *J. Pharm. Soc. Japan*, 55 (1935), 242–243. (R. E. K.)

Urease—New Sources of. Using jack or soy bean under standard conditions for the estimation of urea in ox blood and liver, abnormally high values were obtained; the error is aggravated by prolonging the time of action or increasing the concentration of the enzyme. These effects are negligible when urease from the seed of the watermelon (*Citrullus vulgaris*) is used.—M. DAMODARAN and P. M. SIVARAMAKRISHNAN. *Biochem. J.*, 31 (1937), 1041; through *Physiol. Abstr.*, 22 (1937), 1017. (F. J. S.)

Other Plant Principles

Camphor—Synthetic, Purification of. Camphor is dissolved to saturation in glacial acetic acid and the solution diluted with water to 25% acetic acid; the precipitated camphor is filtered off. The impurities (pinene, borneol) are esterified by, and remain dissolved in, the acetic acid.—MONTECATINI. Brit. pat. 474,097; through *J. Soc. Chem. Ind.*, 57 (1938), 105. (E. G. V.)

Derris Uliginosa. A cultivated sample of *D. uliginosa*, Benth. (true name *D. trifoliata*, Lour.), contained 5.02% of ether extract, including 0.47% of rotenone, and is economically valueless. Its appearance is described.—J. N. MILSUM. *Malay. Agr. J.*, 26 (1938), 18–19; through *J. Soc. Chem. Ind.*, 57 (1938), 426. (E. G. V.)

Rotenone—Occurrence of, in Millettia Pachycarpa. From samples of roots of *Millettia pachycarpa* 4% of total resins and 1.2% of rotenone have been isolated.—T. P. GHOSE and S. KRISHNA. *Current Sci.*, 6 (1937), 57; through *J. Soc. Chem. Ind.*, 57 (1938), 103. (E. G. V.)

Fixed Oils, Fats and Waxes

Edible Oil Deodorizing Equipment and Methods. The earlier methods used in various countries for deodorizing oils are outlined. Treatment of the oil with superheated steam *in vacuo* is the only method now used. Various types of modern plants are described.—A. P. LEE and W. G. KING. *Oil and Soap*, 14 (1937), 263; through *J. Soc. Chem. Ind.*, 57 (1938), 80. (E. G. V.)

Fats—Causes of Rancidity of. Rancidity is due to both hydrolytic and oxidative processes.—A. ZINOVIEV and Z. KOLODESHNAJA. *Maslob. Zhir. Delo*, No. 4 (1937), 22; through *J. Soc. Chem. Ind.*, 57 (1938), 79. (E. G. V.)

Fatty Oils—Colorimetric Reactions of. Color reactions of fatty oils with acetic anhydride may be caused by certain constituents other than the unsaponifiable material. Jesser and Thomae's claim that 10% of soya-bean oil in poppy-seed oil can be detected colorimetrically is disputed. Tables give the color reactions of various fatty oils with acetic anhydride and arsenious chloride, according to Heller and according to Jesser and Thomae. A reply from the latter is appended.—H. Heller. *Angew. Chem.*, 50 (1937), 752; through *J. Soc. Chem. Ind.*, 57 (1938), 80. (E. G. V.)

Flaxseeds—Chemical Constitution of Oils from Superior and Inferior. The compositions and quantities of oils obtained from Abyssinian Yellow and Bison varieties of flaxseeds grown in various localities in Minnesota have been compared. The oils from the former variety always contained a higher percentage of linolenic acid and a lower percentage of oleic acid than those from the latter variety. The compositions of the oils varied with the district where the seeds were grown, but the oil contents of the various seeds were fairly constant. The iodine value of an oil appeared to be a varietal characteristic.—R. A. GROSS and C. H. BAILEY. *Oil and Soap*, 14 (1937), 260; through *J. Soc. Chem. Ind.*, 57 (1938), 80. (E. G. V.)

Oil of Nageshwar [Ironwood] Seed (Mesua Ferrea). The seeds (from Assam) consist of 27% of husk and 73% of kernel containing 68.2% of oil. The cold-pressed oil had: d^{32} 0.922, n_D^{32} 1.4674, acid value 10, saponification value 196, iodine value 90, Reichert-Meissl value 1.26, Polenske value 0.6, acetyl value 0, unsaponifiable matter 3.2%. The fatty acids consisted of palmitic 8.2, stearic 15.8, arachidic (?) 1.0, oleic 55.4 and linoleic acid 19.6%. The presence of a coloring matter, giving an intense yellow, water-soluble dye with alkali, limits the employment of the oil for soapmaking, for which it is otherwise suitable.—N. G. CHATTERJI and A. C. GUPTA. *Oil Colour Trades J.*, 91 (1937), 1656; through *J. Soc. Chem. Ind.*, 56 (1937), B., 696. (E. G. V.)

Oils—Production of, from Fish Livers of Low Oil Content. II. Modified Digestion Process. The wash liquors after centrifugation of the digested livers are re-extracted with an edible (for example, cod liver oil) to recover vitamin dissolved in emulsified oil.—H. N. BROCKLESBY and K. GREEN. *Biol. Board Can. Progress Repts.*, 33 (1937), 7; through *J. Soc. Chem. Ind.*, 57 (1938), 80. (E. G. V.)

Olive Oil. World production, imports and exports of olive oil is given.—ANON. *Chemist and Druggist*, 128 (1938), 166. (A. C. DeD.)

Olives—Parasitic Diseases of, and Physico-Chemical Changes in the Extracted Oil. Infection with *Macrophoma dalmatica* decreases the oil content of the fruit and considerable variation is observed in the characteristics of the expressed oil, particularly an increase in the iodine and Hehner values.—R. SALGUES. *Compt. rend soc. biol.*, 124 (1937), 817–819; through *J. Soc. Chem. Ind.*, 56 (1937), B., 462. (E. G. V.)

Seed Fats—Solid, Fatty Acids and Glycerides of. III. Seed Fat of Madhuca (Bassia) Latifolia (Mowrah Fat). Many solid or semi-solid fats can be separated by systematic crystallization from acetone into two or more fractions, each of which is a simpler mixture of mixed glycerides than the fat as a whole. The component glycerides in each fraction can then be estimated fairly accurately, when the component acids of each have been determined by the ester-fractionation, and the content of tri-C_{18}glycerides has been obtained by determining the tristearin content of each fraction after complete hydrogenation. The approximate proportions of the component glycerides in the whole fat are thus obtained. In the two cases so far studied by this method (cacao butter and mowrah fat), the observed proportions of the major component glycerides of the fats are close to those derived from a simple numerical calculation based on the proportions of the component acids in the whole fat. Mowrah fat is estimated to contain the following molar per-

centages of component glycerides: dipalmitostearins 1, "oleo"-dipalmitins 1, "oleo"-palmitostearins 27, palmitodi-"oleins" 41 and stearodi-"oleins" 30%. (If the fat also contains 5% of tri-"olein" the figures for "oleo"-palmitostearins, palmitodi-"oleins" and stearodi-"oleins" would become, respectively, 32, 36 and 25%). The main components are, at all events, about 40% of palmitodi-"oleins" and 25–30% each of stearodi-"oleins" and "oleo"-palmitostearins. These results resemble those found in the case of cacao butter in their general adherence to the rules of even distribution of the fatty acids among the glycerol molecules. There is the usual minimum proportion of fully saturated glycerides, the preponderance of monopalmito- over monostearoglycerides following preponderance of palmitic over stearic acid in the total fatty acids, and the presence of considerable amounts of the trebly mixed glycerides containing a radical each of palmitic, stearic and unsaturated C_{18} acids. The only marked difference in type between the two fats is that mowrah fat appears to contain almost negligible quantities of the simpler mono-"oleo"-glycerides, "oleo"-dipalmitin and "oleo"-stearin.—T. P. HILDITCH and M. B. ICHAPORIA. *J. Soc. Chem. Ind.*, 57 (1938), 44–48. **IV. Seed Fat of Madhuca Butyracea (Pulwara Butter).** The component acids of this fat were found to be mainly palmitic (57%) and oleic (36%). The fat is remarkable for its high content of palmitic acid and its very low content of stearic acid, the latter feature placing it apart from other seed fats of the same genus or, indeed, of the same family (Sapotaceæ). The fat also contains more fully saturated glycerides than is usual in a seed fat with the observed proportions of saturated and unsaturated acids. The glycerides were studied by resolving the fat into two fractions by systematic crystallization from acetone; the chief components were about 62% of "oleo"-dipalmitins and about 23% of palmitodi-"oleins," with subordinate amounts of tripalmitin (about 8%) and, probably, "oleo"-palmitostearins (about 7%).—W. J. BUSHELL and T. P. HILDITCH. *Ibid.*, 57 (1938), 48–49. **V. Shea Butter.** The component glycerides of shea butter (the seed fat of *Butyrospermum Parkii*, Sapotaceæ) have been reinvestigated by the more detailed methods recently made available. The results confirm and extend those of a previous study in which the general character of the components was established. The chief glycerides in the fat were stearodi-"oleins" (about 45%), oleodistearins (about 35%) and palmitodi-"oleins" (about 10 %); minor amounts of palmitostearins, tri-"olein," and possibly oleopalmitostearin were also present. The fat conforms fairly closely to the usual "evenly distributed" type, and the amounts of palmito and stearo-di-"oleins" are calculable (within a few units) from the proportions of the fatty acids combined in the whole fat. In shea butter, as in cacao butter, mowrah fat and phulwara butter, the linoleic acid is found to be combined almost wholly in di-unsaturated glycerides, and is almost absent from the mono-unsaturated glycerides. This is shown to be merely a necessary consequence of the operation of the "rule of even distribution," linoleic acid being a minor component and oleic acid a major component in all four fats.—T. B. GREEN and T. P. HILDITCH. *Ibid.*, 57 (1938), 49–53. (E. G. V.)

Tea-Seed Oil—Japanese. The production of tea-seed oil from *Camellia japonica* L., *Camellia sasanqua*, Thmub. and *Camellia theifera* has increased considerably of late due to modern methods of production. The first two mentioned varieties produce seeds which contain from 30 to 35% of pure oil. *Camellia theifera* is cultivated in Oshima Island, Japan, and in this country tea-seed oil is known as Tsubaki oil. Tea-seed oil expressed in China on a considerable scale is used as an edible oil after first removing the saponin. The oil, which is straw-colored, closely resembles olive oil in its characteristics except those of its unsaponifiable matter. The Japanese oil produced in modern oil mills, in which the whole process is said to require less than one hour, is said to contain less than 0.1% of free acid as compared with 44% when produced by the old method. The oil cake now finds use in the cosmetic field by Japanese manufacturers in shampoos and similar products. Tea-seed or Tsubaki oil is considered to be the rarest and most expensive of all commercial vegetable oils.—ANON. *Chemist and Druggist*, 128 (1938), 23; through *Am. J. Pharm.*, 110 (1938), 145. (A. C. DeD.)

Fatty Acids—Twitchell Separation of. The Twitchell, Cocks-Christian-Harding and Baughman-Jamieson methods for the quantitative separation of liquid and solid fatty acids have been critically examined. None of the methods gives an entirely reliable result, particularly when isooleic acids are present. The most important factors influencing the precipitation of lead isooleate from alcoholic solution are: neutralization of the fatty acids, presence of potassium acetate and accurate control of temperature at 15°.—R. C. STILLMAN and J. T. R. ANDREWS. *Oil and Soap*, 14 (1937), 257; through *J. Soc. Chem. Ind.*, 57 (1938), 79. (E. G. V.)

Vegetable Fats—Occurrence of Traces of Hexadecenoic (Palmitoleic) Acid in. Cottonseed and palm oils contain 1% or less of hexadecenoic acid, while soy bean oil appears to contain about twice this quantity. Still smaller portions of a tetradecenoic acid may also be present in soy bean and cottonseed oils. The observations are of general interest in that they indicate that hexadecenoic acid is present in vegetable seed and fruit-coat fats, although only in traces; the acid would therefore appear to occur in all classes of natural fats, becoming, however, a major component only in fats from aquatic flora and fauna. The small amounts present in the land vegetable fats will have no perceptible influence on their general properties. The proportion of acid in seed and fruit-coat fats seems to be approximately constant at about 1% or less, and has no apparent relation either to the amount of palmitic acid, or to that of oleic and linoleic acids, which is concurrently present.—J. P. HILDITCH and H. JASPERSON. *J. Soc. Chem. Ind.*, 57 (1938), 84–87. (E. G. V.)

Vegetable Oils—Mechanical Processing of. The technic employed for extracting vegetable oils from seeds and for bleaching and deodorizing the oils is described.—W. W. MOSS. *Trans. Amer. Soc. Mech. Engrs.*, 59 (1937), 715; through *J. Soc. Chem. Ind.*, 57 (1938), 79. (E. G. V.)

Wool Fat—Composition of. Cerotic acid has been isolated from the fatty acid mixture obtained by saponifying wool fat with alcoholic caustic potash. After purification *via* the ethyl ester and the lithium salt, it had m. p. 78° C. and was identical with the product isolated from beeswax. Lanocric acid separated as a gray, insoluble residue when the mixture of fatty acids was dissolved in ether, and, after recrystallization from carbon tetrachloride, had m. p. 102.5° C. Ceryl alcohol, isocholesterol and cholesterol were isolated from the unsaponifiable fraction of wool fat by several crystallizations and precipitations from ethyl and methyl alcohols, but, contrary to the results of former investigators, no carnaubyl investigators, no carnaubyl alcohol could be detected.—A. HEIDUSCHKA and E. NIER. *J. prakt. Chem.*, 149 (1937), 98–106; through *Am. J. Pharm.*, 110 (1938), 158. (A. C. DeD.)

Unclassified

Amyrins. To characterize the amyrins, they were converted to methyl xanthogenates. The methyl ester of alpha amyrin xanthogenate crystallizes from ethyl acetate as colorless needles melting at 218° C., while the corresponding beta amyrin compound is similarly obtained as large plates melting at 177° C. Pyrolysis above the melting point of these compounds yields the amyrilenes. Oxidation of alpha amyrin yielded the ketone, alpha amyrone, m. p. 126° C., the dinitrophenylhydrazone of which melted at 218° C. Vacuum distillation of the mother liquor yielded colorless prismatic crystals of $C_{21}H_{36}O$, m. p. 158° C., soluble in ether and ethyl acetate, slightly soluble in ethanol and methanol, the oxime of which crystallized as colorless needles melting at 219° C., with decomposition. Hydrogenation of the oxime (m. p. 235° C.) of alpha amyrone by the method of Skida did not occur, but on treatment with platinic oxide in glacial acetic acid, it was reduced to amyramine, $C_{30}H_{51}N$, colorless needles melting at 140° C., the picrate of which is obtained as yellow matted needles decomposing at 220° C. Further oxidation of alpha amyrone with chromic acid yielded a neutral product in the form of small scaly crystals of $C_{21}H_{34}O$, m. p. 230° C., in which the function of the oxygen atom was not ascertained; and an acid product which upon conversion to its methyl ester, m. p. 250° C., with diazo methane and subsequent saponification yielded a dibasic acid $C_{21}H_{32}(COOH)_2$. Oxidation of the acetate of beta amyrin with chromic acid yielded a mixture of the normal hydroxy beta amyrin acetate, m. p. 293° C., $[\alpha]_D^{21} = +2.5°$, and the iso compound, m. p. 253° C., $[\alpha]_D^{21} = +61°$. Saponification of the normal compound generated hydroxy beta amyrin, m. p. 207° C., while iso hydroxy beta amyrin was obtained as matted needles, m. p. 222–223° C. Oxidation of amyrin acetate with perhydrol gave a quantitative yield of the normal compound without any isomer. Further oxidation of the normal compound with chromic acid yielded a dibasic acid, $C_{10}H_{38}(COOH)_2$, decomposing at 304–305° C. for which the name amyranthene acid is proposed. From this was prepared the anhydride, decomposing at 310–311° C., and the dimethyl ester, colorless needles melting at 184–185° C. Oxidation of hydroxy beta amyrin acetate with other agents such as selenium dioxide in nitrobenzene or potassium permanganate afforded resinous degradation products. Amyrilene, $C_{30}H_{48}$, m. p. 173–177° C., $[\alpha]_D^{21} = +112°$ and its isomer, m. p. 103–105.5° C., $[\alpha]_D^{21} = +155°$ were obtained by the action of hydrochloric acid on amyrin for varying lengths of time. The possibility

of a third isomer is suggested.—H. DIETERLE, H. BRASS and F. SCHAAL. *Arch. Pharm.*, 275 (1937), 557. (L. L. M.)

Camphor—a New Oxidation Product of. Energetic oxidation of *d*-camphor with chromic acid in acetic anhydride yielded 5-oxo-camphor, traces of camphor-quinone and a new oxo-camphor, which was isolated as its dioxime. Hydrolysis of the new product to trimethyl-2,3,3-cyclopentanone-1-acetic acid-4 (I) indicates its structure as oxo-6-camphor (II). Resolution of I gave acids $[\alpha]_D^{15} - 77.5°$ and $+50.1°$, whereas the acid prepared from *d*-α-campholenic-nitrile showed $[\alpha]_D^{15} + 79.17°$. It was found subsequently that the latter still contained the racemic acid, which crystallized after seeding. Optically pure I was obtained as follows: 40 Gm. of dioxy-dihydro-α-campholenic nitrile (from *d*-camphor) were warmed one hour on a water-bath with 650 cc. of 15% potassium hydroxide. The mixture was acidified and extracted with ether; the crystalline acid recovered by distilling the ether was washed with chloroform, recrystallized from ethyl acetate: yield, 14 Gm.; $[\alpha]_D^{26} + 64.6°$; m. p. 144–145°. Eight grams of the acid so obtained and 250 cc. of 20% sulfuric acid were warmed one hour on the water-bath for hydrolysis, decolorized with carbon, filtered and extracted with ether. The keto-acid was extracted from the ether by bicarbonate solution, liberated with acid and taken up again by ether. It was finally recovered as a syrup which crystallized after two months' refrigeration and was recrystallized from benzene-petrolic ether: colorless monoclinic prisms, m. p. 56–58°; $[\alpha]_D^{31} + 182.2°$ in absolute ethanol; yield, 3 Gm.; semicarbazone, m. p. 230°; oxime, m. p. 126–128°. The levo-series was prepared by identical reactions: *l*-α-campholenic-nitrile, $[\alpha]_D^{27} - 8.9°$; *l*-dioxy-dihydrocampholenic acid, m. p. 144–145°, $[\alpha]_D^{26} - 65.1°$; 1-2,3,3-trimethyl-cyclopentanone-1-acetic acid-4, m. p. 56–58°, $[\alpha]_D^{31} - 181.9°$, semicarbazone and oxime m. p. 230° and 126–128°, respectively. By mixing equal quantities of *d*- and *l*-compounds, the racemates were formed: keto-acid m. p. 65–66°; semicarbazone m. p. 24°, oxime m. p. 184–185°.—K. MIYAKE. *J. Pharm. Soc. Japan*, 55 (1935), 191–193. (R. E. K.)

Camphoric Amides—Preparation of Nitrogen-Substituted. Interaction of the mixed chlorides from *d*-camphoric acid and phosphorus pentachloride with diethylamine in benzene gives *d*-camphordicarboxybisdiethylamide, melting point 130°, optical rotation +90° in absolute ethyl alcohol, plus some *l*-camphordicarboxybisdiethylamide (I); *l*-isocamphordicarboxybis-diethylamide, melting point 80°, and *d*-camphordicarboxybisdimethyl, melting point 91°, boiling point 175°/2 mm., -dibutyl-, boiling point 220–222°/1 mm., -diamyl-, boiling point 230–232°/1 mm. and -methylethyl-amide, melting point 61°, boiling point 180°/2 mm., are similarly prepared. I is also prepared from *d*-camphoricmonodiethylamide through the acid chloride, as are also *d*-camphordicarboxy-α-diethylamide-β-methylethyl-amide, melting point 56°, boiling point 173°/2 mm., and -α-dimethylamide-β-diethylamide, melting point 41–42°, boiling point 187°/3 mm. The products are said to have therapeutic value.—G. B. ELLIS. Brit. pat. 473,995; through *J. Soc. Chem. Ind.*, 57 (1938), 105. (E. G. V.)

***p*-Chlorophenol from *p*-Dichlorobenzene—Preparation of.** *p*-Chlorophenol is obtained in 85% yield by autoclaving *p*-dichlorobenzene 1, sodium hydroxide 3.375 and methyl alcohol 10.7 Gm. mols for 25 hours at 200°; presence of not more than 20% of water in the methyl alcohol does not affect the yield, but methyl alcohol cannot be replaced by water, phenol or ethyl alcohol.—V. MINAEV, B. FEDOROV and G. SARNIT. *Prom. Org. Khim.*, 4 (1937), 19; through *J. Soc. Chem. Ind.*, 57 (1938), 36. (E. G. V.)

Cyclopentanoperhydrophenanthrenes—Manufacture of Water-Soluble Derivatives of. Water-soluble derivatives are obtained by sulfonating (sulfuric acid-acetic anhydride) cyclopentanoperhydrophenanthrene derivatives which have 1 CO in ring A or B. Sulfonic acids are obtained from cholestenone, melting point 193–195°, cholesten-7-one, melting point 178–180° (decomposition), androstenedione, decomposition 196° (methyl ester, melting point 159–160°), progesterone, decomposition 190–192°, cholestanone, melting point 146–148° and coprostanone.—A. CARPMAEL, *I. G. Farbenind.* Brit. pat. 473,629; through *J. Soc. Chem. Ind.*, 57 (1938), 105. (E. G. V.)

Lactones and Lactames—Isolation of. The authors believe that the change or conversion of lactones into lactames has a more significant value than formerly believed. The ammonia group and the primary amine group were replaced with a simple 5-ring lactone and in all cases the expected lactame was yielded. The lactame was identified as α-pyrrolidone and the yield was

quite satisfactory.—E. SPÄTH and J. LINTNER. *Ber.*, 69 (1936), 2727; through *Chem. Zentr.*, 108 (1937), 1421. (G. B.)

Petroleum—Synthetic Products from.—G. EGLOFF. *J. Inst. Petroleum Tech.*, 23 (1937), 645; through *J. Soc. Chem. Ind.*, 57 (1938), 16. (E. G. V.)

Phenolic Compounds—Manufacture of, Containing a Chloromethyl Group and Nitrogen-Containing Condensation Products Therefrom. Phenolic compounds containing a chloromethyl radical are prepared by treating a phenol containing in the nucleus at least one long aliphatic hydrocarbon chain (not less than 4 carbons) with formaldehyde solution saturated with hydrochloric acid. By interaction with organic nitrogen bases which may contain an acid group, if desired in presence of solvents or diluents, they give products which are soluble in water, alone or with alcohol. The preparation is described of chloromethyl compounds from isobutyl-(I), dodecyl-(II), isooctyl-(III) and diisooctyl-phenol (IV), and a technical mixture (V) of isododecyl-, tridecyl- and tetradecyl-, phenol, and of the condensation products of the above derivatives of I with pyridine, melting point 260° (decomposition), of II with pyridine, triethyl amine, aniline and phenyl methyl amine, of III with pyridine and sodium sulfanilate, of IV with pyridine and of V with pyridine, melting point 200–212°, quinoline, trimethyl amine and dimethyl phenyl amine.—W. W. GROVES. Brit. pat. 478,571; through *J. Soc. Chem. Ind.*, 57 (1938), 354. (E. G. V.)

Sterol Derivatives—Preparation of. β- and *epi*-Cholestenol are converted by sulfur oxychloride at 40° with Walden inversion into *epi*-, melting point 110–111°, and β-chlorocholestane, melting point 100°, respectively. Preparation of similar bromine compounds is also claimed.—PARKE, DAVIS AND CO., assignees of R. E. MARKER. Brit. pat. 473,923; through *J. Soc. Chem. Ind.*, 57 (1938), 105. (E. G. V.)

5-Substituted-2,4-Dioxo-Thiazolidines with Narcotic Properties—Synthesis of. 2,4-Dioxo-5,5 dialkyl-thiazolidines may be synthesized by condensation of the corresponding dialkyl-brom-acetic acids with thiourea and saponification of the 2-imino-4-oxo-5,5 dialkyl-thiazolidines thus obtained. The 5,5-diethyl-; 5,5-dipropyl-; and 5,5-phenyl-ethyl-2,4-dioxo-thiazolidines were thus obtained. By direct treatment of 2-imino-4-oxothiazolidine with allyl bromide in alkaline solution, the diallyl compound was obtained which was saponified to 2,4-dioxo-5,5 diallyl-thiazolidine. These compounds are crystalline, colorless, odorless, weakly acid, slightly soluble in water and readily soluble in ether, alcohol or benzene. Some of these compounds in oral or intravenous doses have a hypnotic action comparable to the dialkyl-barbituric acids. Details of the pharmacological action are to be published elsewhere.—H. ERLENMEYER and HARALD VON MEYENBURG. *Helv. Chim. Acta*, 20 (1937), 1388. (G. W. H.)

Sulfonic Acid Amide Compounds—Manufacture of. Acyl derivatives of *p*-aminobenzenesulfonamides or aminobenzenedisulfonamides, in which the acyl group is the residue of an aliphatic or araliphatic monocarboxylic acid of not less than 3 carbon atoms, are said to have activity against streptococci (unlike the lower acyl derivatives) resembling that of *p*-aminobenzamide; their manufacture by standard methods is claimed.—A. CARPMAEL, *I. G. Farbenind.* Brit. pat., 474,423; through *J. Soc. Chem. Ind.*, 57 (1938), 104. (E. G. V.)

Vinylacetylene and Divinylacetylene—Production of. Adding acetylene to a mixture of 1500 Gm. of cuprous chloride, 585 Gm. of ammonium chloride, 625 Gm. of water and 45 Gm. of freshly precipitated copper, the temperature during the reaction being kept at 65°, two new compounds were obtained in about six hours providing the laboratory conditions were ideal. About 75 Gm. of each (vinylacetylene and divinylacetylene) were obtained, besides small quantities of aldehydes and other acetylene derivatives. When the two above-named compounds were condensed at −5°, the condensate obtained consisted principally of divinylacetylene. During the process of distillation of vinylacetylene, a product was obtained which consisted of about from 40–60% of divinylacetylene; other ingredients obtained were: 1–2% of aldehydes and other carbohydrates. The yield of vinylacetylene contains about 10–15% of acetylene. The number of polymers that can be obtained from the gas acetylene is dependent on the absorption of the gas itself.—P. SHAWORONKOW. *Russ. Promyschlenostorganitscheskoi Chimii*, 2 (1936), 219; through *Chem. Zentr.*, 108 (1937), 1668. (G. B.)

BIOCHEMISTRY

Acetone—Determination of, in Blood and Urine. The method is based on the reaction of acetone with Nessler's solution to form a creamy-white precipitate. 0.002 mg. acetone in 0.5 cc.

blood or urine can be determined without initial precipitation of proteins. The sample of blood or acidified urine is heated over an excess of sodium bisulfite which absorbs the acetone; the Nessler's solution is added to this, and the resulting turbidity compared with that produced by standard solutions. The determination takes twenty minutes. The results agree with those obtained by Van Slyke and Behre-Benedict. Of the possible interfering substances, aldehyde may account for 5–15% of the value found. Foreign ketones—*e. g.*, butanone—are also included in the estimation.—J. C. ABELS. *J. Biol. Chem.*, 119 (1937), 663; through *Physiol. Abstr.*, 22 (1937), 997. (F. J. S.)

Acetylcholine—Biological Synthesis of. The authors have demonstrated conclusively that acetylcholine is produced in minced (ox) brain and to a preponderating extent in the grey matter. The results appear to show that acetylcholine is synthesized biologically from choline and aceto-acetic acid, presumably by enzymic action. The research is of especial interest owing to the function of acetylcholine as a transmitter of nervous action.—E. STEDMAN and E. STEDMAN. *Nature*, page 39; through *Chemist and Druggist*, 128 (1938), 478. (A. C. DeD.)

Albumin and Globulin—Determination of, in Serum. I. Errors Involved in the Filtration Procedure. Following precipitation of globulin by the addition of sodium sulfate, filtration through paper results in a significant adsorption loss of albumin to an extent independent of albumin concentration, but dependent on the type and quantity of paper. Re-filtration of the filtrate through the same paper finally produces saturation with albumin. The adsorbed albumin is not eluted by 22% aqueous sodium sulfate. A modified procedure to avoid this source of error is described.—H. W. ROBINSON, J. W. PRICE and C. G. HOGDEN. *J. Biol. Chem.*, 120 (1937), 481; through *Physiol. Abstr.*, 22 (1937), 1035. (F. J. S.)

Alcohol—Ethyl, Micro-Determination of. The method of Nicloux for the micro-determination of ethyl alcohol was modified to give good results with 0.025–0.5% of alcohol. Leuco-methylene blue was used as external indicator for the dichromate titration.—AL. IONESCO-MATIU and C. POPESCO. *Bull. soc. chim. biol., Paris*, 19 (1937), 911; through *Physiol. Abstr.*, 22 (1937), 1012. (F. J. S.)

Amino Acids, Peptides and Cyclopeptides—New Method of Isolating, from Protein Hydrolysates. The basis of this method is that the sulfuric acid hydrolysate is reduced to a solid mass by the addition of lime, treatment with alcohol and desiccation. Extraction in the Soxhlet (I) with ether or chloroform for cyclopeptides, (II) with methyl alcohol for many amino acid salts and (III) water, for amino acids insoluble in alcohol follows. Copper salts are now formed by treatment with sulfuric acid and copper carbonate and the mass is again dehydrated and extracted with methyl alcohol, when the copper salts of isovaline, isoleucine, proline and oxyproline and other cyclic compounds pass into the extract. Methods of maceration are discussed, and the use of the autoclave is recommended instead of prolonged heating.—V. S. SADIKOV. *Compt. rend. acad. sci., U. R. S. S.*, 14 (1937), 313; through *Physiol. Abstr.*, 22 (1937), 1011. (F. J. S.)

Anti-Anemic Preparation. Fresh gastric material containing anti-anemic principles is treated with a suitable extractant that removes the pepsin without injuring the anti-anemic substances. The extractant is separated and the residual gastric material is concentrated.—EDWARD A. GREENSPOON. U. S. pat. 2,103,075, Dec. 21, 1937. (A. P.-C.)

Antigonadotropic Factor. Reversibility of the Prolan-Antiprolan Effect. The inactivation of prolan by antiprolan is a reversible process, since prolan and antiprolan may be released from a neutral prolan-antiprolan mixture and thereby be reactivated. The assumption is made that antiprolan is neither an antihormone nor a ferment, but is possibly a new kind of factor approaching closely the immume bodies to which it is in some respects similar.—BERNHARD ZONDEK and FELIX SULAMN. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 343. (A. E. M.)

Ascorbic Acid—Determination of, in the Blood. The ascorbic acid content of extracts of whole human blood prepared according to E. and E.'s method has been determined by titration against 2:6-dichlorophenol-indophenol and methylene blue. The same values having been found, it is concluded that all the interfering substances which reduce 2:6-dichlorophenol-indophenol and which do not reduce methylene blue are removed by precipitation with mercuric acetate.—ADRIANUS EMMERIE and MARIE VAN EEKELEN. *Biochem. J.*, 31 (1937), 2125; through *Squibb Abstr. Bull.*, 11 (1938), A-136. (F. J. S.)

Ascorbic Acid—Determination of, in Plasma. A Macromethod and Micromethod. A study of the velocity of reduction over 30-second intervals of 2,6-dichlorophenol-indophenol by

metaphosphoric acid filtrates of plasmas has been made. A procedure which accurately measures this reduction over the first 30 seconds and permits detection of the presence of more slowly acting reducing substances has been described for the determination of ascorbic acid concentration of plasma. The procedure reduces the errors due to fading of the dye and reading of the end-point that are inherent in the ordinary titration of ascorbic acid with 2,6-dichlorophenol-indophenol. As written, it is directly applicable to the Evelyn photoelectric colorimeter. With the microapparatus satisfactory results can be obtained from as little as 0.1 cc. of plasma.—ROWLAND L. MINDLIN and ALLAN M. BUTLER. *J. Biol. Chem.*, 122 (1938), 673; through *Squibb Abstr. Bull.*, 11 (1938), A-421. (F. J. S.)

Ascorbic Acid—Distribution of, in the Body. The following vitamin C contents are given: suprarenal gland 135.7 mg. in cattle and 190 mg. in the horse; pituitary 170 mg. (anterior), 200 mg. (intermediary) and 60 mg. (posterior); liver 26.6 mg.; parathyroid 44 mg. (horse); ovary, without yellow body, about 20 mg., the yellow portion 140 mg. Relationships are indicated between the vitamin C content of the glands and their physiologic functions.—A. GIRAUD, A. R. RATSIMAMANGA, C. P. LEBLOND, M. RABINOWICZ and H. DRIEUX. *Bull. soc. chim. biol.* (June 1937); through *J. pharm. Belg.*, 19 (1937), 860. (S. W. G.)

Ascorbic Acid—Enzymic Determination of. The application of ascorbic acid oxidase is described. The reaction is not inhibited by neutralized trichloroacetic acid. Some sources of ascorbic acid contain impurities (not precipitated by mercuric acetate) which reduce the indophenol reagent, but are not enzymically oxidized.—M. SRINIVASAN. *Biochem. J.*, 31 (1937), 1524; through *Physiol. Abstr.*, 22 (1937), 1056. (F. J. S.)

Ascorbic and Thioglycollic Acids—Histidine Breakdown by. When ascorbic acid or thioglycollic acid acts upon histidine in the presence of oxygen, opening of the imidazol ring occurs with the production of ammonia. Part of the nitrogen split off is in the form of a labile intermediate which is only converted into ammonia by the action of the strong alkali (sodium hydroxide). If the experiment is performed at acid reaction, twice as much ammonia is found on distillation of the products with sodium hydroxide as on distillation with sodium carbonate. Under these conditions two atoms of nitrogen have been split off per molecule of histidine. If the experiment is carried out at neutral or alkaline p_H, distillation with sodium carbonate gives more than half of the total nitrogen as ammonia; the increase in "carbonate" ammonia is probably due to deamination of the side chain, and the amount is found to be equivalent to the carbon dioxide produced during the experimental period. Natural *l*-histidine is more readily attacked by ascorbic acid and thioglycollic acid than *d*-histidine. When hydrogen peroxide, ozone or ultraviolet light acts upon histidine, all three nitrogen atoms are split off. Two of these distil as ammonia, when carbonate is used; the third only when sodium hydroxide is used. Isatin does not attack the imidazol ring; it deaminates only the side chain. The enzymic breakdown of histidine in the liver and kidney is discussed in the light of these results.—P. HOLTZ and G. TRIEM. *Hoppe-Seyler's Z.*, 248 (1937), 5; through *Physiol. Abstr.*, 22 (1937), 1073. (F. J. S.)

Bananas—Vitamin Studies in. I. Vitamin A, B_1 and C Contents of Ripe Bananas. Ripe bananas contained 71–95 international units of vitamin A, 4–5 of B_1, and approximately 57 of C per ounce. The titration method does not determine the whole of the physiologically active C in bananas.—P. L. HARRIS and G. L. POLAND. *Food Research*, 2 (1937), 311; through *J. Soc. Chem. Ind.*, 57 (1937), 99. (E. G. V.)

Bilirubin—Determination of, with Photoelectric Colorimeter. A method is described for the accurate photoelectric determination of both direct and indirect bilirubin in serum, in which protein precipitation and consequent loss of bilirubin by adsorption were eliminated. The interfering effect of yellow serum pigments in the color determination was overcome by the use of a specially selected light filter, which also eliminates the necessity for artificial color standards. All the bilirubin in serum reacts with diazo reagent even in the presence of serum proteins, provided that a sufficiently high concentration of alcohol (50%) is present. Bilirubin added to serum is recovered with an average error of +2%. By a modified method a quantitative study of the behavior of the direct reaction of bilirubin in serum was possible.—H. T. MALLOY and K. A. EVELYN. *J. Biol. Chem.*, 119 (1937), 481; through *Physiol. Abstr.*, 22 (1937), 995. (F. J. S.)

Bilirubin—Estimation of, in Blood Plasma. One cubic centimeter of plasma is carefully layered with 0.5 cc. of diazo reagent; a colored ring at the junction shows a positive "direct" reaction. The fluids are mixed and 0.5 cc. of saturated ammonium sulfate, followed by 3 cc. of

absolute alcohol are added. After shaking for one minute the mixture is filtered and compared with a methyl red standard, using a green light filter.—G. A. D. HASLEWOOD and E. J. KING. *Biochem. J.*, 31 (1937), 920; through *Physiol. Abstr.*, 22 (1937), 1030. (F. J. S.)

Biuret Reaction of Organic Substances of Low Molecular Weight. The biuret reaction is given by arginamide and arginine anhydride but not by histidine, succinimide, serine, colamine, arginine or α-benzoylarginine. At least two adjacent $CO.NH_2$, $CS.NH_2$ or $C(:NH)NH_2$ groups are essential for the biuret reaction.—R. KRETSCHMAYER and H. JESSERER. *Biochem. Z.*, 292 (1937), 419; through *Physiol. Abstr.*, 22 (1937), 1013. (F. J. S.)

Blood, Feces and Urine—Utilization of the Fluorescence Produced by Sulfuric Acid in the Determination of Bile Acids in. Blood feces and urine contain substances in addition to bile acids which yield fluorescent solutions in sulfuric acid and hence intensity of fluorescence is not a measure of bile acid content. The substances cannot be removed chemically. Cholic and glyco- and taurocholic acid exhibit a selective absorption band at 385.0 mμ, spectrographic examination of which enables the bile acid content to be determined. Cholesterol, dihydrocholesterol and indican interfere.—M. JENKE and F. BANDOW. *Hoppe-Seyler's Z.*, 249 (1937), 16; through *Physiol. Abstr.*, 22 (1937), 1062. (F. J. S.)

Bromine—Action of, on Proteins. Hydrolytic, enzymic and methylation investigation of brominated caseinogen, collagen and gelatin indicates that the reacted bromine is not attached to the cyclic amino acids—*e. g.*, in the phenolic nucleus of tyrosine. Tyrosine and histidine do not react stoichiometrically with bromine; histidine, and probably also tyrosine are structurally modified on bromination. The evidence obtained indicates a binding of bromine by the peptide linking $(.CH_2.CO.NH.CH:)$.—F. LIEBEN, R. TANDLER and P. WEISS. *Biochem. Z.*, 292 (1937), 82; through *Physiol. Abstr.*, 22 (1937), 991. (F. J. S.)

Bromine Content of Blood. The bromine in 3 cc. of blood is converted first into silver bromide by the Carius method and then into zinc bromide with zinc dust. The bromine is then determined as previously described. For the determination of bromine in serum and plasma, organic matter is destroyed in an open vessel at 100° and the analysis is complete in one hour; 100 cc. of human blood contain 0.2–0.4 mg. of bromine.—H. DOERING. *Biochem. Z.*, 291 (1937), 81; through *Physiol. Abstr.*, 22 (1937), 1037. (F. J. S.)

Bromine—Rôle of, in Nutrition. Rats on an adequate synthetic diet containing less than 0.5 p. p. m. of bromine and others on the same diet supplemented with 16.5–20.2 p. p. m. of bromine did not differ in food intake, rate of growth or reproductive power, but ate less and did not grow as well as rats on a stock diet containing 16.5–20.2 p. p. m. of bromine: the females failed to maintain their young. The young of the rats of the first group contained much less bromine than those of the third. The bromine content of the rats of the second group was much greater than that of those of the third group, the bromine: chlorine ratio of the diet of the former being much less than that of the diet of the latter. Bromine is probably not an essential constituent of the diet of the rat.—P. S. WINNEK and A. H. SMITH. *J. Biol. Chem.*, 121 (1937), 345; through *Physiol. Abstr.*, 22 (1937), 1051. (F. J. S.)

Carbohydrate Complexes—Differentiation of, on Micro-Analysis of Plant Materials. The apparatus described permits the micro-determination of seven fractions of a carbohydrate complex—*viz.*, material soluble in hot alcohol, soluble in cold water, but insoluble in alcohol, soluble in warm water, hydrolyzable by diastase, soluble in hot water, hydrolyzable by 2% sulfuric acid and not hydrolyzable by dilute sulfuric acid. The method gave good results in determination of the constituents of a mixture of sucrose, erythrodextrin, inulin, potato starch and cellulose.—S. M. STREPKOV. *Biochem. Z.*, 290 (1937), 378; and *Z. anal. Chem.*, 108 (1937), 406; through *Physiol. Abstr.*, 22 (1937), 990. (F. J. S.)

Carica Papaya Latex and Latex Preparations—Hydrolytic Properties of. The latex hydrolyzes both gelatin and peptone. The ether-insoluble fraction may be separated to give a centrifugate with the properties of papain. The supernatant liquid, treated with alcohol, yields a precipitant with a lower activity toward peptone, and contains a thermostable activator of peptone, but not of gelatin cleavage. No activator was found in the fruit press juice.—M. FRANKEL, R. MAIMIN and B. SHAPIRO. *Biochem. J.*, 31 (1937), 1926; through *Physiol. Abstr.*, 22 (1937), 1005. (F. J. S.)

Carotene Content of Certain Vegetable Foodstuffs—Factors Affecting. Parboiling causes a slight loss of carotene (I) in rice, but the I content after "home-pounding" is greater in raw rice

owing to easier removal of the husk. Vacuum-drying of leaves at 100° does not affect I, but exposure of fresh leaves to diffuse sunlight causes a slight loss, and preservation under water in presence of formaldehyde or toluene causes variable losses; an atmosphere of carbon dioxide prevents much loss from coriander in water with toluene. Storage of coriander and spinach leaves at various temperatures causes loss of I, the rate of destruction increasing with temperature, but decreasing as the leaves become dry. Boiling does not affect I in leafy vegetable or potatoes, but remove it from legumes. Sprouting of pulses causes gradual loss of I until leaves form, when it rises suddenly and rapidly.—N. K. De. *Indian J. Med. Research*, 24 (1936), 201; through *J. Soc. Chem. Ind.*, 57 (1938), 99. (E. G. V.)

Cherry—Cuticle of, Wax-Like Constituents of. The skins of Bing cherries (*Prunus avium* L.) were examined with respect to the constituents soluble in petroleum ether and ethyl ether. From the petroleum-ether extract were isolated or identified solid fatty acids consisting of a ternary mixture of palmitic, stearic and a small amount of acid higher than C_{18}; liquid fatty acids, linoleic and oleic acids; a small amount of glycerol; and a hydrocarbon fraction consisting predominantly of nonacosane admixed with a hydrocarbon of longer chain length. The ether extracts yielded *d*-glucosidylsitosterol and ursolic acid. The yields of the petroleum ether and ethyl ether extracts amounted to 0.8 and 1%, respectively, of the dried skins. A comparison of these figures with the corresponding figures from apples and pears indicates that herein may be the explanation for the less efficient protective surface coating of the cherry.—K. S. Markley and C. E. Sando. *J. Biol. Chem.*, 119 (1937), 641; through *Physiol. Abstr.*, 22 (1937), 997. (F. J. S.)

Chloride—Errors in Analysis of, in Albuminous Urine. Determinations by the Volhard and indicator adsorption methods give inaccurate results unless the urine (especially in nephritis) is deproteinized. The iodate method of Sendroy can be used without removal of proteins, and is also applicable to the urine of men taking aspirin.—J. Sendroy, Jr. *J. Biol. Chem.*, 120 (1937), 441; through *Physiol. Abstr.*, 22 (1937), 999. (F. J. S.)

Chlorides—Micro-Determination of. The method employs the Volhard reaction and the open Carius digestion technic. Micro-volumetric measurements are made with the precision syringe of Krogh and Keys and the Rehberg microburette. 0.2 cc. of blood is required for analysis. The method is not inferior in speed or accuracy to the best macro-procedures.—A. Keys. *J. Biol. Chem.*, 119 (1937), 389; through *Physiol. Abstr.*, 22 (1937), 995. (F. J. S.)

Chloride—Micro-Determination of, in Biological Fluids by Means of Solid Silver Iodate. I. Gasometric Analysis. II. Titrimetric Analysis. III. Colorimetric Analysis. I. Solutions containing chlorine are shaken with solid silver iodate, and the soluble iodate so formed is determined in the solution by its oxidative reaction with alkaline N_2H_4, the evolved nitrogen being measured manometrically. With 0.02 cc. of serum the error is 1%. No removal of proteins, either by precipitation or digestion, from urine, plasma or serum is required, although protein-free filtrates of serum or whole blood can be used. The reactions involved in the method are discussed from the theoretical viewpoint. II. The iodate formed in the solution is determined volumetrically, using acidified potassium iodide and sodium thiosulfate, with starch indicator. As in the gasometric procedure, proteins need not be removed, and the accuracy and rapidity of the two methods are about the same. III. The iodine liberated as above is determined colorimetrically, either as free iodine or as the blue complex with starch. The method is applicable to salt solutions and protein-free filtrates only. It is not accurate nor as rapid as the above methods, but it can be used for the determination of extremely small amounts of chlorine—*e. g.*, that contained in 0.0006 mg. of sodium chloride.—J. Sendroy, Jr. *J. Biol. Chem.*, 120 (1937), 335, 405, 419; through *Physiol. Abstr.*, 22 (1937), 998. (F. J. S.)

Cholesterol—Solubility of, in Bile Salt Solutions. The solubility of cholesterol in bile salt solutions increases with the increase in concentration of the latter to maximum values, which are more rapidly attained with deoxycholates than with cholates. Solutions of unconjugated salts appear to be better solvents than those of conjugated salts. Coupling with NH_2 acids decreases the solvent effect of cholic and deoxycholic acids.—J. T. Bashour and L. Bauman. *J. Biol. Chem.*, 121 (1937), 1; through *Physiol. Abstr.*, 22 (1937), 1061. (F. J. S.)

Cholesterol and Cholesterilene—Chemical Activation of. Cholesterol acquires antirachitic properties after heating with sulfuric acid, sulfoacetic acid, fuming sulfuric acid or chlorosulfonic acid in acetic acid solution. In most cases sulfur dioxide is evolved in a side reaction. The treatment of cholesterol with sulfuric acid acetic anhydride produces an antirachitic substance, but not

a provitamin D which is activatable by ultraviolet irradiation. Various acids and salts are effective reagents in converting cholesterol and cholesterilene into antirachitic products. The temperature, time and proportion of the reagent are important. Potassium and ammonium cholesteryl sulfate decompose on heating above their melting points to form antirachitic products and the respective potassium or ammonium acid sulfate. Dichloresteryl phosphate also yields an antirachitic product when heated above its melting point. Cholesterol can be converted into an antirachitic product by heating with potassium bisulfate, copper sulfate, zinc chloride, aluminum chloride hexahydrate, phosphoric anhydride or trichloroacetic acid. Cholesterilene yields an antirachitic product when heated with potassium bisulfate, ammonium bisulfate or phosphoric anhydride; also by treatment with hydrochloric acid in ether solution.—J. C. Eck and B. H. Thomas. *J. Biol. Chem.*, 119 (1937), 621; through *Physiol. Abstr.*, 22 (1937), 996. (F. J. S.)

Colloids—Biological, Classification of. Schemes for classifying colloids are suggested and a large number of references are given.—St. J. Przylecki. *Kolloid-Z.*, 79 (1937), 129; through *Physiol. Abstr.*, 22 (1937), 1012. (F. J. S.)

Creatine and Creatinine—Micro-Method for Determination of. The creatinine is adsorbed on prepared fuller's earth from acid solution and eluted by alkaline picrate; estimation is carried out by "compensated absolute" colorimetry. The method is applicable to 5 cc. of solution containing 5–80 μg. of creatine with an error of the order of $\pm$ 1 μg. Recovery from tissue extracts and perfusates, even in the presence of an excess of glucose, arginine, glycine or trichloroacetic acid, is quantitative.—R. B. Fisher and A. E. Wilhelmi. *Biochem. J.*, 31 (1937), 1131; through *Physiol. Abstr.*, 22 (1937), 1002. (F. J. S.)

Creatinine—Determination of, in Blood. A modification of the method of Folin is described. A step photometer or, better, an absolute colorimeter is used. The creatinine content of healthy human whole blood, plasma and serum is 0.5–1.0 mg. per 100 cc. The value remains constant in the individual and is not affected by bleeding, by consuming large amounts of meat or water, or by giving amino acids or diuretics. The creatinine content of cerebro-spinal fluid, pleural exudates or ascites is of the same order as that of blood.—H. Popper, E. Mandel and H. Mayer. *Biochem. Z.*, 291 (1937), 354; through *Physiol. Abstr.*, 22 (1937), 1040. (F. J. S.)

Datescen, Morin and Quercetin. The absorption spectra of these flavones and some of their derivatives are recorded.—R. Grinbaumowna and L. Marchlewski. *Biochem. Z.*, 290 (1937), 261; through *Physiol. Abstr.*, 22 (1937), 990. (F. J. S.)

Diabetes—Indispensable Reactions for the Definite Proof of, in the Examination of Urine. F. states that the following tests are necessary: (1) Reduction tests with Fehling's, or Nylander's reagent or with *o*-nitrophenyl-propionic acid indicating glucose, fructose, pentoses and lactose or other reducing substances which might appear in urine when certain medicinals are taken. (2) Fermentation tests in which monosaccharides of the hexose series are fermentable and the disaccharides and pentoses are not. The procedure is as follows: Take three test-tubes provided with corks holding a glass U-tube and introduce (*a*) tap water and yeast, (*b*) 1% dextrose in tap water and yeast and (*c*) urine and yeast; (*a*) indicates if the yeast itself contains fermentable substances, (*b*) shows if the yeast might ferment dextrose solution, (*c*) indicates if the urine contains fermentable sugars; if (*c*) shows fermentation, glucose or fructose might be present. (3) Osazone formation and the melting points of the crystalline products. (4) To distinguish between glucose and levulose, a polarimeter must be used and this is done by treating the urine sample with animal charcoal or lead acetate and observing the rotation of the clear filtrate. Warning is given on a diagnosis based only on one of these tests.—K. Feist. *Apoth. Ztg.*, 53 (1938), 133–134. (H. M. B.)

Enterocrinin, a Hormone Which Excites the Glands of the Small Intestine. The name enterocrinin is proposed for a hormone which has the property of exciting the glands of the small intestine and is an important factor in the secretion of succus entericus. This hormone is now obtained free from vasodilatin from the small and large intestines of several species of animals (swine, dog, etc.). It differs from secretin in that its administration does not excite the pancreas but augments the secretion of enzymes as well as fluid.—E. S. Nasset. *Am. J. Physiol.*, 121 (1938), 481; through *Am. J. Pharm.*, 110 (1938), 141. (A. C. DeD.)

Erythrocytes—Effect of Roentgen Rays, on the Colloidal Properties of. The author studied the effect of 200 kv. Roentgen radiations on the osmotic properties of sheep erythrocytes. It was found that the susceptibility to hemolysis of erythrocytes which were irradiated when fresh

was increased by irradiation; however, this effect was reversed when the cells were irradiated after they had been kept in physiological saline for several days at low temperatures. Briefly the results are interpreted as meaning that the hemoglobin of fresh cells is split to compounds of smaller molecules by Roentgen radiation, while that of aged cells is coagulated.—HELEN Q. WOODARD. *J. Physical Chem.*, 42 (1938), 47; through *Am. J. Pharm.*, 110 (1938), 98. (A. C. DeD.)

Estriol—Extraction and Spectral Detection of, in the Urine of Pregnant Women. To 100 cc. of urine add hydrochloric acid to turn Congo paper dark blue, then add 1.5 cc. more of concentrated hydrochloric acid. Autoclave for 1 hour at 120° C. or reflux for 4 hours. This hydrolyzes the estriol-glucuronic acid union. Add 5 Gm. of fuller's earth, shake 30 minutes and centrifuge. Discard the solution and extract the sedimented earth with three 20-cc. portions of half-normal sodium hydroxide and one 10-cc. portion of 95% alcohol. Combine the four extracts and extract in a separatory funnel with 5 cc. of chloroform. Draw off the chloroform and mix it with an equal volume of a 1:2 sulfuric-acetic acid mixture. After standing for several hours the mixture separates and the lower layer shows a greenish fluorescence in daylight or a bright yellow fluorescence in Wood's light from a quartz mercury lamp if estriol is present. This can be used to detect pregnancy. Urine from non-pregnant women gives only a faint blue fluorescence when treated in the same manner.—H. BIERRY and B. GOUZON. *Compt. rend. soc. biol.*, 124 (1937), 320–323; through *Chimie & Industrie*, 38 (1937), 869. (A. P.-C.)

Estrogenic Substance—Synthesis of, from Animal Sterols. It seems possible to synthesize from agnosterol the follicular hormone or a product having the same activity. The isocholesterol of lanolin contains 8% of this sterol which is inactive and which possesses an ultra-violet absorption spectrum almost identical with that of the natural follicular hormone. The synthesis is based on blocking the hydroxyl group by acetylation and the double bonds by bromination, condensing with maleic anhydride, and cutting the side chain by chromic acid oxidation. There is finally obtained a resinous mass, which could not be identified chemically, so that it is as yet impossible to state whether it is impure follicular hormone or a new product derived from a sterol. Biological assays carried out first by the Allen-Doisy method, and then on female rabbits and monkeys, showed that the product possesses high estrogenic potency when injected subcutaneously in doses of 0.1 mg. in solution in oil.—I. REMESOW and N. TAVASTSTJERNA. *Rec. trav. chim. pays-Bas*, 55 (1936), 791–797; through *Chimie & Industrie*, 38 (1937), 937. (A. P.-C.)

Ethyl Alcohol—Manufacture of, from Crude Batate. Acid Hydrolysis and Amylo-Processes. Addition of 10% of crude sugar molasses to crude batate mash which had been hydrolyzed by dilute hydrochloric acid, and subsequent fermentation with *Sacch. robustus*, gave an 85% yield of ethyl alcohol. By the amylo-process, using *Rhizopus javanicus*, an 80% yield of ethyl alcohol (calculated on the original starch) was obtained.—R. NAKAZAWA, M. NAKANO and K. KOBAYASI. *J. Agr. Chem. Soc. Japan*, 13 (1937), 815; through *J. Soc. Chem. Ind.*, 57 (1938), 96. (E. G. V.)

Fermentation—Theories of. Theories are reviewed.—S. S. EPSTEIN and S. LAUFER. *Am. Brewer*, 68 (1935), 14; through *J. Soc. Chem. Ind.*, 56 (1937), 718. (E. G. V.)

Flavin—Determination of, in Foodstuffs. Flavin (I) is extracted from foodstuffs with 20% methyl alcohol acidified to p_H 1.0, and after evaporation of the methyl alcohol it is adsorbed on fuller's earth and eluted with a mixture of methyl alcohol, pyridine and water. The eluate is distilled in vacuum to small bulk, treated with acetone, centrifuged and neutralized to p_H 7.0. I is then determined colorimetrically by comparison of its fluorescence in ultraviolet light against that of a standard. Light is excluded as far as possible and the solution is kept acid to avoid destruction of I. Analytical results are given for 40 foodstuffs; they agree fairly closely with results from biological assay.—G. N. MURTHY. *Indian J. Med. Research*, 24 (1937), 1083; through *J. Soc. Chem. Ind.*, 57 (1938), 99. (E. G. V.)

Fluorine—Ingested, Transference of, from Parent to Offspring. Fluorine fed to female rats as sodium fluoride or tea infusion was transferred to the young during gestation and probably lactation. The more fluorine was given, the more was transferred. The dentine of the offspring was irregular.—E. REID and R. G. CHENG. *Chinese J. Physiol.*, 12 (1937), 233; through *Physiol. Abstr.*, 22 (1937), 1077. (F. J. S.)

Fluorine Intoxication—Chronic, Serum Phosphatase Activity in Generalized Osteosclerosis Due to, in Man. Chronic fluorine intoxication should be considered as a possible cause of obscure

generalized osteosclerosis, particularly if associated with normal serum phosphatase activity.—KAJ ROHOLM, ALEXANDER B. GUTMAN and ETHEL B. GUTMAN. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 376. (A. E. M.)

Follicular Hormone—Synthesis of an Isomer of the, from Vegetable Sterols. Starting from neo-ergosterol, obtained by dehydration of ergosterol in sunlight and in presence of eosin, there was prepared what is probably one of the stereo-isomers of the follicular hormone. After blocking the nuclei of the neo-ergosterol by acetylation and bromination, the side chain was attacked by progressive oxidation, first with ozone and then by Grignard's method using phenyl magnesium bromide. The final product has a composition corresponding to the formula $C_{18}H_{22}O_2$, but has not yet been completely studied. Biological tests proved that its potency was identical with that of the follicular hormone.—I. REMESOW. *Rec. trav. chim. Pays-Bas*, 55 (1936), 797–803; through *Chimie & Industrie*, 38 (1937), 938. (A. P.-C.)

Folliculin—Crystallized, Industrial Extraction of Physical and Biological Determinations. In obtaining folliculin from the urine of pregnant mares, in which it is at maximum concentration between the 5th and 7th month of gestation, a reliable control method for the determination of folliculin is needed. The Kober-Marrian colorimetric determination cannot be used at low concentrations owing to the dark colors of the liquids. A spectrophotometric method, with application of Beer's law, is described in detail, with curves showing characteristic maximum absorption ratios at $\lambda = 2775$ Angstrom units of alcohol solutions of folliculin and related substances, at definite concentrations. However, this rapid method checks with results by the biological Allen-Doisy method only near the end of the manufacturing process; hence the biological method, although expensive, is thus far the only one available for determination of folliculin at low concentrations. The successive stages of manufacture are described.—MELLE. D. VAN STOLK, H. PENAU and R. LEROY DE LENCHÈRE. *J. pharm. chim.*, 24 (1936), 249–266; through *Chimie & Industrie*, 38 (1937), 936. (A. P.-C.)

Fructose Content of Spinal Fluid. Spinal fluid (from normal and meningitis cases) contains a substance having the properties of fructose. It is present in higher concentration than in the blood (3 mg./100 cc. in comparison with 0.5 mg. in blood), and varies in amount with the concentration of the total sugar.—R. S. HUBBARD and N. M. RUSSELL. *J. Biol. Chem.*, 119 (1937), 647; through *Physiol. Abstr.*, 22 (1937), 1087. (F. J. S.)

Fucoidin. Pure fucoidin was isolated from the droplets exuded by *Laminaria digitata* leaves. It is a polymer of a carbohydrate sulfuric acid ester containing fucose, sodium, potassium and a little calcium and magnesium.—G. LUNDE, E. HEEN and E. ÖY. *Hoppe-Seyler's Z.*, 247 (1937), 189; through *Physiol. Abstr.*, 22 (1937), 1007. (F. J. S.)

Furfuraldehyde—Gravimetric Determination of. The relative merits of the thiobarbituric acid and phloroglucinol methods for the gravimetric estimation of furfuraldehyde are discussed and objections to the adoption of the former as a general precipitant of the aldehyde in the analysis of woods are raised. Diphenylthiobarbituric acid may be suitable as a precipitant in this particular analytical work.—W. G. CAMPBELL and L. H. SMITH. *Biochem. J.*, 31 (1937), 535; through *Physiol. Abstr.*, 22 (1937), 1001. (F. J. S.)

Gall-Bladder Evacuant (Cholagogues)—New Method for Testing. The authors chose the telescope fish since it served as a new general test animal for the evaluation of medicinal products. This fish, *Carassius auratus* var. *macrophthalmus* Duerigen, native to China, has transparent scales which make the fish appear scaleless. It is four to six inches or more long, is translucent or even transparent to light. It thus permits the visibility of the green gall-bladder, a round globular bile reservoir approximately one-twelfth of an inch in diameter, directly below the swim bladder. A concentrated or spot light behind the fish and possibly magnification with a hand lens permits the observation of the gall-bladder. Upon injection into the major tail vein (caudal) of minute amounts of cholecystokinin (approximately 0.03 mg.) the gall-bladder progressively emptied its contents until the decrease in volume was obvious after one to one and one-half hours, and evacuation complete after two and two and one-half hours. The green or yellow bile excreted from the gall-bladder was subsequently found as an obvious pigment in the intestinal canal. With purified cholecystokinin as a reference standard and the young, "scaleless," telescope fish as the test animal, the author aims to evaluate cholagogic substances or those of possible value in stimulating bile flow.—A. VIEHOEVER. *Am. J. Pharm.*, 110 (1938), 188. (A. C. DeD.)

Glucose and Fructose—Destruction of, by Oxygen. The interconversion of dilute buffered carbohydrate solutions and the oxidation of fructose by oxygen gas are independent phenomena separable from one another under carefully controlled conditions. The oxidation takes place in the presence of phosphate and arsenate solutions, but not in the other buffer systems studied. The oxidation may be brought about by the catalytic action of traces of impurities in the phosphate and arsenate used. Glucose treated similarly is not destroyed under conditions which show up to 40% destruction of fructose in six hours.—M. CLINTON and R. S. HUBBARD. *J. Biol. Chem.*, 119 (1937), 467; through *Physiol. Abstr.*, 22 (1937), 995. (F. J. S.)

Glucose—Photo Electric Determination of, in Blood and Urine. The method depends on the diminution of color due to the reduction of $Fe(CN)_6'''$.—W. S. HOFFMAN. *J. Biol. Chem.*, 120 (1937), 51; through *Physiol. Chem.*, 22 (1937), 998. (F. J. S.)

Glucose—Quantitative Determination of Small Amounts of, in Mixtures Containing Maltose. A method is described for the quantitative determination of small amounts of glucose and maltose in the presence of each other. Fermentation of maltose is completely inhibited in alkaline solutions which permit full fermentation of glucose. The total reducing power is determined by the use of a strongly alkaline copper reagent which ensures full oxidation of maltose and non-fermentable polysaccharides as well as of glucose.—M. SOMOGYI. *J. Biol. Chem.*, 119 (1937), 741; through *Physiol. Abstr.*, 22 (1937), 997. (F. J. S.)

Glucoses—Methylated, Disintegration of, in Alkaline Medium. The reducing properties of various mono- and polymethylglucoses to various reagents and under varying conditions were examined. The results of Sobotka (*J. Biol. Chem.*, 69 (1926), 267) are generally confirmed. With mild treatment by alkaline ferricyanide at 70° C., oxidation of 3- and 3:5:6-derivatives has a higher initial velocity, but diminishes more rapidly than that of glucose; a similar relationship exists between the 2- and 2:3:4:6-derivatives. Transformation of 2-methylglucose occurs more readily than that of glucose. With periodic acid, production of aldehyde increases with proximity of $.CH_3$ to C_6, and with increase in the number of $.CH_3$ groups. Data for the equilibrium potentials of methylglucoses are given.—N. ARIYAMA and T. KITASATO. *J. Biochem. Tokyo*, 25 (1937), 357; through *Physiol. Abstr.*, 22 (1937), 1010. (F. J. S.)

Glucosone—Production of, from Carbohydrates. Plasmolyzed by toluene, bromobenzene, or chloroform, cultures of *A. parasiticus* Speare and an unnamed mould of the *flavus* section of the *flavus-oryzæ* series of the Aspergilli converted glucose in dilute aqueous solutions into glucosone; the optimum conditions for this oxidation are given. Under the same conditions soluble starch, maltose and sucrose gave much better yields of glucosone than those obtained from glucose.—C. R. BOND, E. C. KNIGHT and T. K. WALKER. *Biochem. J.*, 31 (1937), 1033; through *Physiol. Abstr.*, 22 (1937), 1001. (F. J. S.)

Glyceric Acid and Its Esters—Determination of. A highly specific method of determining glyceric, phosphoglyceric and diphosphoglyceric acids is described, depending on the production of a blue color on heating glyceric acid with naphthoresorcinol in concentrated sulfuric acid. The method determines 0.15–0.40 mg. with an error of 1–4%. A modification for the determination of serine is described.—S. RAPOPORT. *Biochem. Z.*, 289 (1936), 406; through *Physiol. Abstr.*, 22 (1937), 990. (F. J. S.)

Gonadotropic Hormone—Source of Error in, Determinations. Various precipitating methods of gonadotropic substances in urine include a fat-insoluble estrogenic substance that interferes with a reliable assay in immature rats or mice.—ALLAN PALMER. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 295. (A. E. M.)

Halibut—Chemical and Biochemical Studies of. I. Iced and Frozen Muscle Juice. Halibut-muscle juice stored at 1.5° showed no change in p_H, conductivity, oxidation-reduction potential, or index of refraction until the sixth day, when bacterial decomposition set in. Denaturation of proteins was progressive from the outset, and changes occurred which rendered the proteins more susceptible to denaturation after freezing and thawing.—W. A. RIDDELL, H. N. BROCKLESBY and L. I. PUGSLEY. *Biol. Board Can., Progress Repts.*, No 33 (1937), 13; through *J. Soc. Chem. Ind.*, 57 (1938), 98. **II. Iced Fish.** The trimethylamine content of the muscle of halibut kept on ice remained constant for approximately 12 days, and then rose rapidly as bacterial decomposition set in. Within this time only a very slight increase in amino acids occurred, so that little autolysis could have taken place.—H. N. BROCKLESBY and W. A. RIDDELL. *Ibid.*, 13; through *Ibid.*, 98. (E. G. V.)

Hemoglobin—Comparative Investigation of Methods of Determining, in Blood. A spectral colorimetric method for determination of reduced hemoglobin is described and shown to give trustworthy results and good agreement with results by gas analysis. A similar method for determination of hematin is described and also iodometric and colorimetric methods for determination of iron in 1–2 cc. of blood. The hemoglobin content can be calculated from the iron content with considerable accuracy. Comparative tests by these methods with twenty-five samples of whole blood gave results showing good agreement.—W. WEISE. *Biochem. Z.*, 293 (1937), 64; through *Physiol. Abstr.*, 22 (1937), 1033. (F. J. S.)

Hemoglobin—Determination of Blood, in Anemia. Place exactly 0.5 cc. of blood (1 cc. of anemic blood) in a 50-cc. flask, add, drop by drop, 2 cc. of concentrated sulfuric acid and mix. Add 2 cc. of saturated potassium persulfate solution and mix. Heat for 10 minutes on a water-bath at 80°, cool, dilute to about 25 cc. with distilled water and add 2 cc. of 10% sodium tungstate (Folin-Wu reagent), mix and allow to cool to room temperature. Make up to 50 cc., mix, filter through a dry filter into a dry flask. Transfer exactly 20 cc. of the clear filtrate to a tube graduated at 20 and 25 cc. Measure into a similar tube exactly 1 cc. of a standard solution containing 0.1 mg. of iron in each cc. and add from a pipette 0.8 cc. of concentrated sulfuric acid. Dilute to 20 cc. with distilled water and allow to cool. Add to both tubes at the same time 1 cc. of saturated potassium persulfate solution and 4 cc. of potassium thiocyanate solution (146 Gm. in 500 cc. distilled water + 20 cc. acetone). Mix and compare in a colorimeter. *Calculations.*—E = divisions read for standard and I = divisions for sample. The mg. of iron in 100 cc. of blood $= \frac{E \times 50}{I}$. Hemoglobin contains 0.0335 mg. % iron. $\frac{I \times 3.35}{E \times 50}$ = amount of hemoglobin in 100 cc. of blood.—L. SERVANTIE. *Bull. soc. pharm. Bordeaux*, 75 (1937), 211–217. (S. W. G.)

Hexosamines—Oxidation of. *d*-Glucosamine and *d*-Glucosaminic Acid. The oxidation of *d*-glucosamine and *d*-glucosaminic acid with chloramine T in aqueous solution was studied. Both substances were easily oxidized at 37.5° C., yielding *d*-arabinose as the principal product, together with small amounts of *d*-erythrose cyanhydrin. Acetyl *d*-glucosamine is not oxidized under these conditions.—R. M. HERBST. *J. Biol. Chem.*, 119 (1937), 85; through *Physiol. Abstr.*, 22 (1937), 993. (F. J. S.)

Hog Stomach Preparations—Peptic Activity of. The following method is proposed. *Solutions Required.*—1. Casein substrate. One-half Gm. of pure casein is dissolved in 40 cc. of water plus 20 cc. of *N*/10 sodium hydroxide by warming and stirring on a water bath. Solution is effected in about 5–10 minutes. To this solution is added rapidly and with vigorous stirring 30 cc. of *N*/10 hydrochloric acid, the solution filtered and the volume made up to 100 cc. The casein substrate prepared in this way is only slightly opalescent. 2. Dilute hydrochloric acid. One liter of solution is prepared by adding enough distilled water to 120 cc. of *N*/1 hydrochloric acid. 3. Pepsin solution. A weighed quantity of the hog stomach preparation passing No. 40 sieve is shaken at intervals with the dilute hydrochloric acid for 2 hours at room temperature. A dilution of 1 Gm. of the preparation in 1 liter of acid is usually suitable for comparative estimations. 4. A saturated solution of ammonium sulfate. *Procedure.*—Into each of seven tubes (12 x 1.4 cm.) is pipetted 1 cc. of the 0.5% casein solution, followed by 0.7, 0.6 . . . . 0.2, 0.1 cc. of the filtered pepsin solution, by means of a 1-cc. pipette graduated in 1/100 cc. The solutions are then diluted to 4 cc. with the dilute hydrochloric acid, mixed and incubated for 1 hour at 40°. The test-tubes are marked at 4 cc. and the acid can thus be run in from a burette. After incubation, 0.5 cc. of saturated ammonium sulfate solution is added to each tube, the solutions are mixed and their turbidities compared as rapidly as possible. The tubes are held in front of a card with light face, 8 point Gill Sans type print on it. That tube through which the print is just readable is known as the index tube. The amount of hog stomach preparation in this tube will digest 0.005 Gm. of casein.—F. E. RYMILL and C. A. MACDONALD. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 323–326. (S. W. G.)

Hydroxy-Fatty Acids—Hydroxyl Number of. Details are given of a method previously described (*Physiol. Abstr.*, 21 (1936), No. 3086).—K. HINSBERG. *Biochem. Z.*, 289 (1936), 294; through *Physiol. Abstr.*, 22 (1937), 889. (F. J. S.)

Icterus in Blood Donors. Report of two blood donors universal type, developing icterus after giving 400 cc. of blood. Recovery in 10 days. Probable cause due to hemolysis caused by

rapid ingestion of large quantity of water to balance loss of blood.—ARESKY AMORIN and LUIZ MARTINS. *Rev. Soc. Med. e Cirurgia de Rio de Janeiro*, 50 (1936), 575; through *Rev. brasil. med. Farm.*, 13 (1937), 64. (G. S. G.)

Insulin—Crystallization of. Crystallized insulin was obtained by Scott's method modified by the addition of zinc and ferric salts.—B. STALLMAN. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 77; through *Physiol. Abstr.*, 22 (1937), 1068. (F. J. S.)

Insulin—Effect of Tannic Acid and Zinc on the Absorption of. The authors confirm previous findings that tannic acid prolongs the hypoglycemic action of insulin, and show that the addition of zinc to the tannic acid-insulin complex still further prolongs the action. Tannic acid-insulin-zinc suspensions with a tannic acid-insulin ratio of 2:1 have been shown to produce a hypoglycemia as prolonged as that produced by protamine-insulin-zinc suspensions. The 3:1 and 2:1 ratios of tannic acid to insulin have been found to be equally efficient, and the latter is recommended for clinical use as it is less likely to produce local reactions on injection. The efficiency of tannic acid as an insulin precipitant has been investigated, and results are given which show that, in a suspension containing tannic acid and insulin in the ratio of 2:1, 99 to 100% of the insulin is precipitated. It is suggested that the evidence submitted justifies a clinical trial of tannic acid-insulin-zinc containing tannic acid-insulin in the ratio of 2:1 and 1 mg. of zinc to each 500 units of insulin.—W. A. BROOM and E. M. BAVIN. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 334–342. (S. W. G.)

Insulin—Inactivation of, by Normal Blood. Insulin mixed with normal human blood was incubated at 37° C. for various periods. Blood sugar was estimated in rabbits which were injected with insulin obtained by this procedure. Blood sugar was not decreased by insulin which had been twenty-two hours in contact with blood. The insulin-destroying activity of the blood varied with the age of the individual. The contact period required was twenty-eight hours for the ages of 20–60 years, eighteen hours above 60 years.—H. KOHL, H. SELBACH and A. JANNING. *Arch. exptl. Path. Pharmakol.*, 185 (1937), 212; through *Physiol. Abstr.*, 22 (1937), 1068. (F. J. S.)

Insulin Preparations—Physico-Chemical Method for Assay of. Insulin in amounts of 1.5–2 units can be determined by a polarographic method, which has been employed with satisfactory results by a commercial laboratory for two years and verified by M. and W. The method depends upon the effect of insulin on the curve of ion stream potential plotted against ion stream intensity when a solution containing insulin, cobalt chloride, ammonium chloride, ammonium hydroxide and water is subjected to electrolysis. The curve is obtained automatically by means of the Leybold polarograph. Most of the contaminating substances interfering with the determination in crude insulin preparations can be removed by treatment with concentrated alcohol. The resultant alcoholic solution can be directly subjected to polarographic analysis. The method is cheaper and more convenient than biological assays.—K. MULLI and H. WERNER. *Deut. med. Wochschr.*, 63 (1937), 1941; through *Squibb Abstr. Bull.*, 11 (1938), A-177. (F. J. S.)

Iodine Content of Blood. Blood iodine is determined by digesting with chromium trioxide and sulfuric acid, adding a large amount of oxalic acid, and distilling in a slow current of air. The distillate is collected in aqueous potassium hydroxide, concentrated, neutralized, treated with bromine, and is titrated with 0.001*N* sodium thiosulfate. Values for healthy men averaged 0.0035 and for women 0.0026 mg. per 100 cc. The value is not affected by the administration of thyroid gland, but in Graves' disease and in health is increased (sometimes very greatly) by administration of iodine or potassium iodide.—E. J. BAUMANN and N. METZGER. *J. Biol. Chem.*, 121 (1937), 231; through *Physiol. Abstr.*, 22 (1937), 1037. (F. J. S.)

Iron—Availability of, of Grape Juice. It was demonstrated that the grape juice employed in this study aids in the regeneration of hemoglobin and is a good source of nutritionally available iron. The addition to the diet of ten ounces of grape juice daily aids in the prevention of secondary anemia. In view of the consistent gain in hemoglobin in subjects displaying definite secondary anemia, it may be concluded that grape juice is beneficial in the treatment of secondary anemia.—WILLIAM FISHBEIN, JOSEPH K. CALVIN and JOHANNA HEUMANN. *Arch. Pediatrics*, 55 (1938), 42; through *Squibb Abstr. Bull.*, 11 (1938), A-337. (F. J. S.)

Iron—Inorganic, Determination of, in Animal Tissues. A modified method for the estimation of inorganic iron in animal tissues involving the use of homogenization and heat is described. The low results for inorganic iron in liver and blood when sodium pyrophosphate is added are due

to partial precipitation of the iron as iron pyrophosphate. Only part of the iron in liver is in the inorganic form.—D. R. BORGEN and C. A. ELVEHJEM. *J. Biol. Chem.*, 119 (1937), 725; through *Physiol. Abstr.*, 22 (1937), 997. (F. J. S.)

Lead—Determination of, in Whole Blood. A modification of the dithizone method is described for the determination of small amounts (0.5–10 $\times$ 10^{-4} Gm.) of lead in blood, etc. (5–10 cc.), in which the removal of iron is unnecessary and all precipitation and filtration are avoided. Oxidative action of iron is exluded by the addition of $Na_2S_2O_4$. Precipitation of iron is avoided by the presence of ammonium citrate and the iron is converted into a stable complex by the addition of potassium cyanide. Dithizone is extracted in nitrogen. The maximum and mean scattering of results correspond with an accuracy of 6.5 and 3.8%, respectively.—H. KRAFTSTRÖM, K. WÜLFERT and O. SYDNES. *Biochem. Z.*, 290 (1937), 382; through *Physiol. Abstr.*, 22 (1937), 1036. (F. J. S.)

Lead—Estimation of, in Biological Materials. The various dithizone methods for estimation of lead were applied to a large variety of biological materials. The authors give a critical survey of the tests, together with a recommended extraction procedure. Interference by bismuth, tin, calcium phosphate and iron are discussed. A new titration procedure which eliminates the necessity of providing expensive photometric equipment is described; standardization of the dithizone solution is avoided.—M. K. HORWITT and G. R. COWGILL. *J. Biol. Chem.*, 119 (1937), 553; through *Physiol. Abstr.*, 22 (1937), 996. (F. J. S.)

Lead—Simple Method for the Determination of, in Urine. To 50 cc. of urine add 5 cc. of concentrated nitric acid, evaporate, ignite to a white ash, dissolve in 20 cc. of 10% nitric acid, add 25 cc. of a solution containing 1 Gm. of nitric acid, 1 Gm. of potassium cyanide and 50 cc. of ammonia per 100 cc.; after 5 to 10 minutes add 3 cc. of a 0.005% solution of dithizone in chloroform and shake for 30 seconds. In presence of lead the chloroform layer turns a more or less deep red. The quantitative determination can be carried out colorimetrically. A positive test is obtained with as little as 0.0001 mg. The urine of normal individuals gives a negative test; when saturnism exists, the test becomes positive.—L. PRETI and S. MAUGERI. *Medicina Lavoro*, 27 (1936), No. 2, 33–38 (1936); through *Chimie & Industrie*, 38 (1937), 453. (A. P.-C.)

Lecithin—Extraction of, from Soya-Bean Oil Residues. Optimum purity and yield are obtained by extraction with acetone (which removes water, waxes and phosphatides with phosphorus to nitrogen ratio other than 1 to 1) and extraction of the residue with methyl alcohol, this extract being precipitated with acetone. The application of the process is exemplified by analytical data of residues of German and Italian origin.—E. SALMOIRAGHI. *Ann. chim. applicata*, 27 (1937), 332; through *J. Soc. Chem. Ind.*, 57 (1938), 79. (E. G. V.)

Liver Extracts—Color Reaction Applied to. The material was finely minced, mixed with four times its weight of water, heated on a boiling water-bath for 1 hour, filtered, the residue was washed with hot water and the filtrate diluted to give 5 cc. per Gm. of tissue taken. Five cubic centimeters of urea cyanide reagent were added to 2.5 cc. of the extract and after shaking, 2 cc. of Folin uric acid reagent were added. The mixture was allowed to stand at room temperature for 30 minutes, and then diluted with distilled water so that the reading with a 1-cm. cell in a Lovibond Tintometer was about 5 blue units. Blue value (blue units per Gm.) = tintometer reading $\times$ final dilution. The author's findings are summarized as follows: Two types of chromogen have been demonstrated in normal liver. The precipitable chromogen has been found to be absent from the liver of one case of untreated pernicious anemia, but present in the liver of one case of treated pernicious anemia. The chromogen contained by other tissues has been found, with one exception, to be very small compared to that in liver. Chromogen has been shown to be present to a large extent in autolyzed yeast and to a much smaller extent in dried acetone yeast (*i. e.*, bakers' yeast) and to be absent from yeast nucleic acid and the mixed pentose-nucleotides of yeast. Wheat embryo extract has been shown to be rich in chromogen. A great difference has been shown between various commercial liver extracts both in their total chromogen content and in that of lead acetate-precipitable chromogen. A brief discussion of the possible significance of chromogenic material is given.—G. E. SHAW. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 380–386. (S. W. G.)

Magnesium in Milk Products. Determination by a Micro-Method. The material is ashed, dissolved in hydrochloric acid, the calcium (if present) precipitated as calcium oxalate at p_H 3, the ammonium salts and soluble oxalate are removed by ashing, the residue is dissolved in

hydrochloric acid and the magnesium precipitated as magnesium ammonium phosphate, the phosphorus of which is determined by a molybdate colorimetric method. Technic is described by which the magnesium to phosphorus ratio in the magnesium ammonium phosphate precipitate may be controlled. The error of the method is within ±2%. Magnesium contents of various milk products are given.—J. H. BUSHILL, L. H. LAMPITT and D. J. FILMER. *J. Soc. Chem. Ind.*, 56 (1937), 411T. (E. G. V.)

Male Hormones. In a number of cases the administration of male hormones had a favorable influence on general debility.—W. STEMMER. *Münch. med. Wochschr.* (July 30, 1937), 1205; through *Brit. Med. J.*, 4006 (1937), 782B. (W. H. H.)

Manganese—Essentialness of, for the Normal Development of Bone. Studies are described showing the necessity of manganese in the diet of chicks and of hens used for breeding, to prevent perosis. Chicks on a diet adequate in manganese have about 0.2 mg. manganese per 100 Gm. of bone. Rabbits, dogs and rats also have manganese in their bones, indicating that it may be generally necessary for bone development.—W. D. GALLUP and L. C. NORRIS. *Science*, 87 (1938), 18; through *Squibb Abstr. Bull.*, 11 (1938), A-227. (F. J. S.)

***d*-Mannitol—Production of, from Glycerol by Molds of the Aspergillus Glaucus Group. I.** *Aspergillus glaucus* cultivated at 16–30° converts 20–30% of the glycerol, present as sole carbon source, into *d*-mannitol, maximum yield being obtained with glycerol concentration of 5–10 volume % and p_H 7.0.—I. YAMASAKI and M. SIMOMURA. *Biochem. Z.*, 291 (1937), 240; through *Physiol. Abstr.*, 22 (1937), 991. (F. J. S.)

Margarine—Raising the Vitamin A Content of, with Carotine Preparations. The author made several tests on rats with margarine which had been made rich in vitamin A artificially and was able to obtain favorable results in the growth factor. The source of the vitamin A was an extract from the roots of *Daucus carota* and from stinging nettles. The root extract contained 10,000 to 13,000 vitamin A units per Gm. which corresponded to 80 to 100 units per Gm. of dried root. About 8 Gm. of extract were obtained from 1 Kg. of dry root. One kilogram of dried stinging nettles yielded 4.2 Gm. extract.—S. N. MATZKO. *Z. Untersuch. Lebensm.*, 72 (1936), 143; through *Pharm. Weekblad*, 74 (1937), 912. (E. H. W.)

Molds—Physiological Degeneration and Regeneration of, Producing Citric Acid. Molds propagated for long periods frequently undergo spontaneous degeneration, those strains of *Aspergillus niger* which produce citric acid losing much of their power to do so and producing instead increased amounts of oxalic acid. Degenerated strains temporarily recover part of their citric acid-producing power when grown on soil containing sucrose or glucose. In strains producing much citric acid before degeneration the power is restored to or above its original level by long-continued (approximately one year) growth, with frequent transfer to fresh portions of medium, on malt wort containing peptone or guanidine, or on other liquid media containing material favorable (urea is unfavorable) to regeneration. Accumulation of oxalic acid occurs when the medium contains guanidine urea.—T. CHRZASZCZ and M. ZAKOMORNY. *Biochem. Z.*, 291 (1937), 312; through *Physiol. Abstr.*, 22 (1937), 991. (F. J. S.)

Neutral Salts—Action of, on Proteins. A preliminary communication on the mechanism of the action of neutral salts on proteins. The percentage of total nitrogen extracted from collagen by salt solutions, always greater than that extracted by water, depends on the nature of the ions of the salts. Salt solutions with bivalent cations extract more nitrogen than solutions of salts with monovalent cations. The amino-nitrogen was, however, less than that of aqueous extracts. The differences between results obtained by the methods of Van Slyke and of Sorensen are discussed.—I. A. SMORODINZEW and S. A. PAVLOV. *Bull. soc. chim. biol., Paris*, 19 (1937), 915; through *Physiol. Abstr.*, 22 (1937), 1012. (F. J. S.)

Nitrogen, Sulfur, Potassium and Chloride Metabolism in Vitamin B_1 Deficient Rats. Though vitamin B_1 is significant in oxidative processes in cells of the central nervous system and possibly in cellular metabolism in general, its complete depletion is not associated with disturbances in the metabolism of the most essential elements of the diet.—MARTHA SANDBERG, DAVID PERLA and OLIVE M. HOLLY. *Proc Soc. Exptl. Biol. Med.*, 37 (1937), 350. (A. E. M.)

Phosphatases in Blood Plasma and Inorganic Phosphorus in Blood—Micromethods for the Estimation of. The amount of phosphatases in blood plasma is increased in certain bone diseases. Since it is desirable to make a series of determinations of blood phosphatases for which only a small quantity of blood would be available for each observation, a microtechnic was developed

for which 50 cu. mm. of blood plasma suffices for duplicate determinations and for blank experiments. The activity of plasma phosphatases is inhibited much more by barbituric acid buffers than by ammonia buffers. The p_H of optimum phosphatase activity depends on the time of reaction, being 9.0 for 21 hours, 8.7 for 45 hours and 8.65 for 70 hours. This is explained by assuming that enzymic processes and destruction of enzyme occur most rapidly in the most alkaline solutions. The activation of blood phosphatase by magnesium described by Kay (*J. Biol. Chem.*, 89 (1930), 235–247) has been confirmed. These observations are embodied in the following method: add 50 cu. mm. of capillary blood to 1 cc. of 0.9% sodium chloride and centrifuge the solution to obtain the clear plasma solution (A); simultaneously make a hematocrit estimation on heparin blood, to be used in calculating the actual volume of blood plasma. Add 200 cu. mm. of A to 200 cu. mm. substrate (8 cc. of normal ammonia, 12 cc. of normal ammonium chloride, 1 Gm. of sodium β-glycerophosphate and 2 cc. of molar magnesium chloride, made up to 100 cc.), allow to stand at 37° C. for 24 hours, and stop the reaction by adding 300 cu. mm. of 10% trichloroacetic acid. Carry out a blank determination by mixing simultaneously 200 cu. mm. of A, 200 cu. mm. of substrate and 200 cu. mm. of trichloroacetic acid. Remove the precipitated protein by centrifuging. To 400 cu. mm. of the clear supernatant liquid add 100 cu. mm. of sulfuric acid-molybdate solution (B) (100 cc. of ammonium molybdate, 45 cc. of ten times normal sulfuric acid and 105 cc. of water) add 100 cu. mm. of amidol solution (C) (15 Gm. sodium sulfite and 1.5 Gm. amidol in 100 cc. of water; this solution is diluted 5 times with water just before use; if kept dark and cold, it is stable for 2 weeks). The intensity of the blue color formed is determined with a photometer after 15 minutes. If the blue color formed is several times too intense, dilute the solution with a solution consisting of 1 part of B, 1 part of C and 4 parts of trichloroacetic acid. A phosphatase unit is defined as the amount of phosphatase that will liberate 1 mg. of phosphorus under the above conditions. Phosphatase estimations of healthy individuals showed that 100 cc. of blood plasma of children under 1 year contains 160 to 240 phosphatase units; this value is 40 to 140 for children 3 to 13 years old, and 30 to 50 for adults of 20 to 30 years. Owing to the difficulties in separating blood serum from the corpuscles, whole blood is used for the determination of inorganic phosphorus in blood, as follows: add 50 cu. mm. of blood to 600 cu. mm. of 1% trichloroacetic acid, then add 300 cu. mm. of 15% trichloroacetic acid, separate the precipitated protein by centrifuging and use 400 cu. mm. of the supernatant liquid for the determination of phosphorus as described above.—E. LUNDSTEEN and E. VERMEHREN. *Compt. rend. trav. lab. Carlsberg*, 21 (1936), 147–165; through *Chimie & Industrie*, 38 (1937), 869. (A. P.-C.)

Phosphates—Organic, of Urine. Inorganic phosphorus is removed with magnesium hydroxide mixture (p_H 8.8–9.0), an aliquot of the filtrate is digested with 60% $HClO_4$ plus 1 or 2 drops of 30% hydrogen peroxide, and the PO_4''' produced is determined colorimetrically. A diet rich in organic phosphorus raises the urinary excretion of organic phosphorus.—J. J. RAE. *Biochem. J.*, 31 (1937), 1622; through *Physiol. Abstr.*, 22 (1937), 1062. (F. J. S.)

Polysaccharide—Water-Soluble, from Barley Leaves. A cold water extract of barley leaves contained a polysaccharide made up of fructofuranose units linked by bonds, each of which engages the reducing group of one fructofuranose unit (C_2) and the C_6 position of the contiguous fructofuranose unit.—W. N. HAWORTH, E. L. HIRST and R. R. LYNE. *Biochem. J.*, 31 (1937), 786; through *Physiol. Abstr.*, 22 (1937), 1001. (F. J. S.)

Potassium—Blood, Photometric Estimation of. Blood (7–8 cc.) is deproteinized by trichloroacetic acid and ashed in the presence of $HClO_4$. The ash is dissolved in a little dilute $HClO_4$ and is treated with H_2PtCl_6. The precipitated K_2PtCl_6 is separated, treated with KI-H_2SO_4 and extinction coefficients of the red-colored solution of K_2PtI_6 are measured photometrically.—A. HEIDUSCHKA and H. OBER. *Biochem. Z.*, 292 (1937), 191; through *Physiol. Abstr.*, 22 (1937), 1036. (F. J. S.)

Potassium—Photo-Electric Determination of, in Minute Quantities of Serum. A photoelectric modification of the Jacobs-Hoffman colorimetric method is described. Slight alterations in the reagents and washing procedures are also recorded.—W. S. HOFFMAN. *J. Biol. Chem.*, 120 (1937), 57; through *Physiol. Abstr.*, 22 (1937), 1037. (F. J. S.)

Production of Substances for Promoting the Growth of Backward Infants. Whole colostrum (preferably from cows), or the proteins (casein, globulin and albumin) separated therefrom

by known methods, is/are dried and defatted.—G. GROH. Brit. pat. 467,825; through *J. Soc. Chem. Ind.*, 57 (1938), 105. (E. G. V.)

Progestin in the Pregnant Mare. Pregnant mare's corpora lutea constitute the best natural source of progestin yet discovered.—JIRO KIMURA and WILLIAM R. LYONS. *Proc. Soc. Exptl. Biol. Med.*, 37 (1937), 423. (A. E. M.)

Protein—Effect of Quality of, on Oestrus Cycle. Rats kept on a diet containing 5% casein as the sole source of protein soon ceased to show even the vaginal changes characteristic of regularly occurring oestrus. The addition of gelatin brought about a partial restoration, while the addition of gliadin rapidly produced a normal sexual rhythm. The deficient diets did not produce permanent sterility.—P. B. PEARSON, E. B. HART and G. BOHSTEDT. *J. Nutrition*, 14 (1937), 329; through *Physiol. Abstr.*, 22 (1937), 1083. (F. J. S.)

Proteins—Combination of, with Copper, Nickel and Cobalt. Caseinogen in alkaline solution combines stoichiometrically with copper, nickel and cobalt (as hydroxides) to give violet, gold-yellow and red-brown colored derivatives, respectively, dialysis of which yields a blue neutral copper derivative of equal copper content and a neutral cobalt derivative of the same color and cobalt content; the nickel compound is decomposed to nickel hydroxide. Compounds of copper, nickel and cobalt with zein, edestin, fibrin, gelatin, and Witte's, silk and caseinogen peptone were investigated. The compounds with peptones are less defined than those with proteins. The presence of the metals prevents *N*-methylation, while the methylated proteins behave abnormally only with nickel. The metals probably combine at the peptide linking. No reaction occurs between iron and proteins.—H. JESSERER and F. LIEBEN. *Biochem. Z.*, 292 (1937), 403; through *Physiol. Abstr.*, 22 (1937), 993. (F. J. S.)

Provitamin D—Plant. The provitamin D of the sterols in cottonseed oil and Scopolia root was isolated and found to be ergosterol, not 7-dehydrositosterol as had been believed. The cottonseed oil and Scopolia root were chosen for this investigation since their phytosterol fractions contained 5.0 and 1.40% provitamin, more than that contained in other plant sources, *i. e.*, spinach, beans, horse-chestnuts, carrots, wheat seedlings, white cabbage and turnips. The identification of the provitamin as ergosterol was accomplished by the preparation of the acetate and dinitrobenzoate and the irradiation product and comparing these with the corresponding derivatives of ergosterol, 7-dehydrositosterol and 7-dehydrostigmasterol.—A. WINDAUS and F. BOCK. *Z. physiol. Chem.*, 250 (1937), 258; through *Squibb Abstr. Bull.*, 11 (1938), A-138. (F. J. S.)

Sandal (Santalum Album, L.)—Wax from the Leaves of. The saponified wax yields a small amount of fatty acid, the unsaponifiable material consisting of palmitone (*n*-hentriacontan-16-one), 44%; *d*-10-hydroxypalmitone, m. p. 96.4–96.6°, 6%; and mixed primary alcohols (approximately 75% of *n*-$C_{28}H_{57}$.OH and 25% of *n*-$C_{30}H_{61}$.OH), 50%; no paraffin is present. *n*-Hentriacontan-10:16-dione, m. p. 87.9–88.1°, *d*-*n*-hentriacontan-10-ol, m. p. 81–81.2°, and *n*-triacontan-15-one, m. p. 78.8–79.2°, were prepared.—A. C. CHIBNALL, S. H. PIPER, H. A. EL MANGOURI, E. F. WILLIAMS and A. V. V. IYENGAR. *Biochem. J.*, 31 (1937), 1981; through *Physiol. Abstr.*, 22 (1937), 1006. (F. J. S.)

Silica—Biochemistry of. The largest amount of silicon is found in fully developed plants grown on sandy soil. Among the most prominent silicon plants, containing the therapeutically active, soluble silicic acid, may be counted especially Equisetum (arvense) and Polygonum (aviculare). Silicon occurs either in the seeds of cardamom fruits and in the fibers of cocos nucifera, inasmuch as the silica bodies, there present, are completely soluble in hydrofluoric acid. Silicon occurs as silicic acid or inorganic silicates in Equisetum (heimale). Silicon probably occurs in the equisetum epidermis also in an organic combination with the cellulosic material of the cell wall for the following reasons: the epidermal tissue, after prolonged treatment with freshly prepared copper oxide ammonia solution, in order to dissolve any adhering cellulose, and washing with water (*a*) was charred, upon heating, proving the presence of organic matter; (*b*) becomes soft when treated with hydrofluoric acid, giving a cellulose reaction with chlorzinciodide; (*c*) showed considerable resistance to attack of cellulose destroying bacteria. *Daphnia magna* yielded, undried, 0.0875% of silica, present in the mandibles, and probably also in the chitinous shell. The ash yielded 0.982% of silica.—ARNO VIEHOEVER and SAMUEL C. PRUSKY. *Am. J. Pharm.*, 110 (1938), 99. (A. C. DeD.)

Stearic Acid—Synthesis of. A preliminary communciation of the synthesis of stearic acid by catalytic hydrogenation of hexadecaheptenalmalonic acid.—R. KUHN, C. GRUNDMANN and

H. TRISCHMANN. *Hoppe-Seyler's Z.*, 248 (1937), IV–V; through *Physiol. Abstr.*, 22 (1937), 1007. (F. J. S.)

Sugars—Combination of, with Amino Acids in Oxygen. Heating to 70° C. in a current of oxygen of a mixture of glycine and glucose (especially when the molecular ratio is 1:1.5) in phosphate buffer at p_H 8 produces an evolution of carbon dioxide, diminution of p_H, formation of lactic acid and disappearance of glucose much greater than when the glucose is similarly treated without glycine. The effect is very marked with iron phosphate buffers. The glycine is practically unchanged by the treatment.—B. BAUMINGER and F. LIEBEN. *Biochem. Z.*, 292 (1937), 92; through *Physiol. Abstr.*, 22 (1937), 992. (F. J. S.)

Sulfanilamide—Determination of, in Blood and Urine. Sulfanilamide may be determined in urine, blood and other body fluids by a method based on diazotization of the sulfanilamide and subsequent coupling of the diazo compound with dimethyl-α-naphthylamine to form a purplish red dye which can be estimated colorimetrically. The reaction is given by one part of sulfanilamide in 20,000,000 parts of water. It depends on the presence of an amino group substituted in the benzene ring and probably can also be used to determine any derivative of sulfanilamide in which the amino group is free or can be freed by hydrolysis. In the mouse, rat, cat, rabbit, monkey and man, but not in the dog, sulfanilamide is excreted as the acetyl derivative, as was previously shown, and hence the acetylsulfanilamide must be hydrolyzed before the determination.—E. K. MARSHALL, JR., and DOROTHEA BABBITT. *J. Biol. Chem.*, 122 (1937), 263; through *Squibb Abstr. Bull.*, 11 (1938), A-201. (F. J. S.)

Sulfanilamide—Porphyrinuria Following. Sulfanilamide Dermatitis. Urines of patients undergoing sulfanilamide treatment, and for some time afterward, contain abnormal amounts of ether-soluble porphyrin; daily outputs up to 463γ—nearly ten times the normal—have been recorded. Healthy adult rats have been treated with 0.4, 0.3 and 0.1 Gm. of sulfanilamide per day for long periods, the drug being added to a standard artificial diet, and porphyrin excretion in urine and feces determined for three-day periods. An immediate rise was observed. The urinary excretion rose to approximately 9, 7 and 2 times the normal level with the different doses, maxima being reached in 2 to 3 weeks. The excretion in the feces was also increased and the extra porphyrin had the properties of coproporphyrin. From the urines, coproporphyrin III was isolated as the crystalline tetramethyl ester. The excretion of coproporphyrin III indicates that the mechanisms of hemoglobin synthesis and pigment metabolism are susceptible to the action of sulfanilamide and the possible bearing of such action on some of the recorded toxic effects on man—aganulocytosis, sudden anemia and light dermatitis—is obvious. Some of the more acute toxic conditions—colic, vomiting, etc.—usually attributed to met- and sulfhemoglobinæmia, are also seen in acute porphyrinuria. The advisability of urinary porphyrin determinations during sulfanilamide treatment is indicated.—CLAUDE RIMINGTON. *Chemistry and Industry*, 57 (1938), 87. (E. G. V.)

Sulfur—Ethereal, Estimation of, in Serum and Urine. The inorganic sulfate content is determined before and after acid hydrolysis for 15 minutes at 100° C.; the difference gives the "ethereal" sulfate.—S. LORANT and A. HERZOG. *Biochem. Z.*, 292 (1937), 98; through *Physiol. Abstr.*, 22 (1937), 991. (F. J. S.)

Suprarenal Cortex Extracts—Standardization of. In normal children injection of the active extract of suprarenal cortex raises the blood sodium, and experiments on rabbits proved that this rise is to a certain extent proportional to the quantity of hormone injected. On the basis of this observation a method of assaying the efficiency of cortical extracts could, the authors believe, be devised.—G. TÖRÖK and L. NEUFELD. *Lancet*, 233 (1937), 1485. (W. H. H.)

Thiocyanate—Determination of, in Tissues. The tissue is digested with alcoholic potassium hydroxide and the digest is freed from alcohol and deproteinized by nitric-tungstic acid. The filtrate is made alkaline and pigments are removed by carbon, CNS′ being determined colormetrically as the ferric salt in the resulting solution. With 75×10^{-6} Gm. of CNS′ the error is approximately 8%.—B. B. BRODIE and M. M. FRIEDMAN. *J. Biol. Chem.*, 120 (1937), 511; through *Physiol. Abstr.*, 22 (1937), 999. (F. J. S.)

Thiophene Series—Pepper-Like Derivative of. The preparation of 2-phenyl-thiophen-5-carboxylic acid piperidide is described.—W. STEINKOPF and R. GORDING. *Biochem. Z.*, 292 (1937), 368; through *Physiol. Abstr.*, 22 (1937), 992. (F. J. S.)

Tunny Oil—Vitamin Content and Therapeutic Value of. Clinical and biological tests indicate the relatively high therapeutic efficacy and vitamin D content of the oil.—S. SANNA. *Boll. chim.-farm.*, 76 (1937), 497; through *J. Soc. Chem. Ind.*, 57 (1938), 104. (E. G. V.)

Tyrosine and Tryptophan—Mercuric Salts and Nitrous Acid in the Colorimetric Determination of, Present in Solution. In the determination of tyrosine and tryptophan contents of hydrolysates of plant-leaf proteins by the method of Folin and Ciocalteu a turbidity often develops. A modified procedure for the determination of tyrosine is described in which tyrosine is first treated with mercuric salts, the resulting product with nitrous acid giving a red color. The precipitate of tryptophan mercuric sulfate, which separates while tyrosine is being mercurated, is redissolved and treated with nitrous acid under defined conditions. The color thus produced is suitable for the determination of tryptophan. The course of the reactions between tyrosine and tryptophan and mercuric salts and nitrous acid has been investigated and the effect of interfering substances determined.—J. W. H. LUGG. *Biochem. J.*, 31 (1937), 1422; through *Physiol. Abstr.*, 22 (1937), 1003. (F. J. S.)

Urea—Effect of, on the Degree of Hydration of Proteins. The amount of sodium chloride required to precipitate fibrinogen from solution in physiological aqueous sodium chloride is increased by the addition of urea in concentrations not less than $0.25M$, η of the fibrinogen solutions being increased. Urea also increases η of gelatin solutions and in sufficient concentration delays or prevents coagulation of blood. These results are explained by supposing that the degree of hydration of proteins is increased by urea.—F. HEIM. *Biochem. Z.*, 291 (1937), 88; through *Physiol. Abstr.*, 22 (1937), 991. (F. J. S.)

Vitamin A and D—Distribution of, in Some Organs of British Columbia Herring, Pilchard, Grayfish and Halibut. The vitamin A content of the body oil of the pilchard, herring and grayfish is low compared with that of the liver oil but oil from the viscera of halibut was richer in A than the liver oil. The vitamin A of the viscera is best extracted with another fish oil of low A content.—L. I. PUGSLEY. *Biol. Board Can. Progress Repts.*, 33 (1937), 8; through *J. Soc. Chem. Ind.*, 57 (1938), 80. (E. G. V.)

Vitamin B_1—Chemical Assay of. The author shows that the quantitative measurement of vitamin B_1 (by fluorescence of the thiochrome produced from vitamin B_1 on treatment with alkaline ferricyanide) gives results which are too low owing to incomplete extraction. Vitamin-B pyrophosphate is insoluble in isopropyl alcohol and is therefore omitted in chemical assay. In consequence, yeast preparations may, on chemical assay, appear inert, though known to have the usual activity of 6–10 international units per Gm. of vitamin B_1.—M. PYKE. *Nature*, No. 3582, page 1141; through *Chemist and Druggist*, 129 (1938), 15. (A. C. DeD.)

Vitamin B_1—Chemical Method for Determining. In a small test-tube mix 6 cc. of Kinnersley and Peters reagent (100 cc. of normal sodium hydroxide, 5.76 Gm. sodium bicarbonate and 100 cc. of water), 3.2 cc. of diazotized sulfanilic acid (0.5%), 3 drops of 40% formaldehyde and 1 cc. of the extract to be tested; shake quickly, place for 10 minutes in a water-bath at 90° to 95° C., and compare colorimetrically. The preparation of the solution to be tested is described in detail.—W. A. DEVJATNIN. *Compt. rend. acad. sci. U. R. S. S.*, 4 (1936), 67–71; through *Chimie & Industrie*, 38 (1937), 451. (A. P.-C.)

Vitamin B_1—Destruction of, in Blood. No appreciable destruction of vitamin B_1 occurs when the aqueous hydrochloride at p_H 6.0 is kept at 0° for three months, or at 37° for twenty-four hours. In oxalated blood, fresh or boiled, it is stable at 19° for twenty-four hours, but appreciably destroyed at 37°.—P. C. LEONG. *Biochem. J.*, 31 (1937), 1391; through *Physiol. Abstr.*, 22 (1937), 1039. (F. J. S.)

Vitamin B_1—Determination of, in Blood by a Modification of Schopfer's Test. The method of Schopfer for the determination of small amounts of vitamin B_1 by means of its growth-promoting activity on *Phycomyces Blakesleeanus* can be used with certain modifications for the determination of vitamin B_1 in small amounts (2 cc.) of blood. The validity of the test is discussed. —A. P. MEIKLEJOHN. *Biochem. J.*, 31 (1937), 1441; through *Physiol. Abstr.*, 22 (1937), 1039. (F. J. S.)

Vitamin C in Citrus-Juice Beverages and Canned Grapefruit Juice. Samples of dairy-type citrus beverages contained 8–227 units of C per ounce, one sample of orangeade nil, and carbonated citrus beverages 0–5. Loss of C is rapid in the first-named even at cold-storage temperature.

Canned grapefruit juice lost on an average 25% of its C in 9–15 months.—J. A. ROBERTS. *Food Research*, 2 (1937), 331; through *J. Soc. Chem. Ind.*, 57 (1938), 99. (E. G. V.)

Vitamin C Content of Orange Peel and Its Pharmaceutical Preparations. Twelve varieties of Chinese medicinal orange peel show 0.0024 to 0.0179% of ascorbic acid. Drying orange peel in the absence of direct sunlight causes a slow diminution of ascorbic acid content. The ascorbic acid content of the tincture diminishes rapidly during storage. It is most stable in 90% alcohol, less stable in 70% alcohol and least stable in water. The titration values of orange peel infusion agree closely with those obtained by biological assay.—H. C. HOU. *Chinese Med. J.*, 50 (1936), 1227–1234; through *Chimie & Industrie*, 38 (1937), 937. (A. P.-C.)

Vitamin C—Distribution of, in Chinese Vegetables. The vitamin C content was estimated by iodine titration and by Bersey and King's method before and after treatment with hydrogen sulfide in twenty-two vegetables, including cabbage, kale, mustard, mallow, celery, parsnips, colza, turnip tops, spinach, amaranth, fennel, garlic, onion, pea shoots, cauliflower, beet tops, coriander and leek. In most of them there was more vitamin C in the leaves than in the stem and in the lamina than in the petiole; half had more in the inner and half in the outer leaves, half had more in the flower and half in the leaves. In carrots, radishes and turnips the leaves contained more vitamin than the roots, where the outer layer was the richest.—H. C. HOU. *Chinese J. Physiol.*, 12 (1937), 249; through *Physiol. Abstr.*, 22 (1937), 1056. (F. J. S.)

Vitamin G and Synthetic Riboflavin. The Sherman-Bourquin method of estimation of vitamin G is a test for riboflavin. One unit is equivalent to 2.0–2.5 micrograms of riboflavin.—O. H. BESSEY. *J. Nutrition*, 15 (1938), 11; through *Am. J. Pharm.*, 110 (1938), 142. (A. C. DeD.)

Volatile Substances—Manometric Estimation of. A simple method was devised for the manometric estimation of the concentration of ether in manometric vessels, depending on the variation with temperature of the solubility of volatile liquids or gases in water. It may be of use with substances other than ether whose partition coefficients vary sufficiently with temperature.—M. JOWETT. *Biochem. J.*, 31 (1937), 1097; through *Physiol. Abstr.*, 22 (1937), 1002. (F. J. S.)

White Bean—Metabolic Effects of. In rats, a diet containing 25% of white bean meal diminishes the basal metabolic rate, but does not affect the blood-sugar level. The metabolism apparatus of Belák and Illényi is more suitable for use with small animals than is that of Benedict.—A. ILLÉNYI and L. ZSELYONKA. *Biochem. Z.*, 291 (1937), 266; through *Physiol. Abstr.*, 22 (1937), 1076. (F. J. S.)

Wines—Spectrophotometry of Coloring Matters of. I. Irpinian Wines and the Commoner Artificial Dyes. Spectrophotometric analysis indicates that the natural and artificial coloring matters may be clearly differentiated. The results for 13 wines are tabulated.—C. VIOLANTE and G. BEMPORAD. *Ann. chim. applicata*, 27 (1937), 399; through *J. Soc. Chem. Ind.*, 57 (1938), 96. (E. G. V.)

ANALYTICAL

Acriflavine—Determination of, and Related Compounds in Pharmaceutical Preparations and Surgical Dressings. The following summary is given: Modifications of the ferricyanide method previously published are given for the determination of acriflavine, euflavine and proflavine, in various pharmaceutical preparations and surgical dressings, and suitable preliminary treatment for extraction of the medicament is described. It is shown that errors in the estimation may arise, due to reducing impurities which are liable to occur in the fabric or basis of the preparation. In view of the small proportion of medicament usually present in these preparations, errors due to impurities in glyco-gelatin base may amount to 5–10% of the amount of medicament present. The reducing action of glycerin may be controlled by suitable precautions, and the error due to this cause is then small. Surgical dressings containing euflavine may vary in strength due to selective adsorption, unless the manufacture is properly controlled; these dressings are also liable to deteriorate after manufacture, owing to the effect of light on the dyestuff. The effect of reducing impurities in the gauze itself varies with different samples, and may introduce errors varying from 5 to 13%.—G. F. HALL and A. D. POWELL *Quart. J. Pharm. Pharmacol.*, 10 (1937), 486–497. (S. W. G.)

Adrenaline—Chemical Determination of, in Solutions Containing Protein. Recoveries (iodine determination) of no more than 61% of epinephrine added to plasma (0.1 mg. per cc.)

were achieved when the solutions were deproteinized with trichloroacetic acid. Recoveries of 77–89% were obtained in the ultrafiltrate when deproteinization of plasma was accomplished by ultrafiltration. The loss was not due to oxidation, since the yield in the ultrafiltrate was not altered by the presence of glycine and guanidine, which protect epinephrine from oxidation, nor by allowing the solutions of epinephrine in plasma to stand in air up to four hours. When 1 cc. of 2*N* hydrochloric acid was mixed with 14 cc. of plasma containing 0.05 to 0.2 mg. per cc. epinephrine, the ultrafiltrates contained 1.10 (+ 4%) times the concentration of epinephrine in the plasma. Tables are given showing the effects of alkali on the determination of epinephrine by the iodine method.—JOHN L. D'SILVA. *Biochem. J.*, 31 (1937), 2171; through *Squibb Abstr. Bull.*, 11 (1938), A-350. (F. J. S.)

Alcohol—Purification and Utilization of. (III). Utilization and (IV,V) Purification of Light Fractions from Dehydration. III. The light fractions, consisting of ethyl alcohol contaminated with aldehydes, amines, furfuraldehyde, benzene and methyl alcohol, and obtained as by-products of the azeotropic dehydration of ethyl alcohol, may be utilized for the preparation of low-quality products. **IV.** Ethyl alcohol containing not more than 0.02% of aldehydes cannot be obtained from the light fractions by rectification. Experiments on a semi-industrial scale indicate that 95% of the aldehydes can be removed by heating with sodium hydroxide before rectification. **V.** Purification is affected on an industrial scale as follows. One gram of sodium hydroxide per Gm. of aldehydes present is added to the material, which is then maintained at room temperature for 12–24 hours, and at 70° for 6 hours, after which it is slowly distilled until the aldehyde content of the residue falls to 0.06%. The distillates obtained up to this point consist of an azeotropic mixture of ethyl alcohol, methyl alcohol, benzene, benzine and water, followed by a fraction (14%) containing 60–70% of methyl alcohol and 0.7–0.9% of aldehydes. The residue is then rapidly distilled at a rate such that the distillate contains not less than 92.5% by volume of ethyl alcohol; the product so obtained in 70% yield contains more than 0.02% of aldehydes, and may be used for the preparation of denatured alcohol.—L. KOWALCZYK. *Przemysl Chem.*, 21 (1937), 8; through *J. Soc. Chem. Ind.*, 56 (1937), B., 646. (E. G. V.)

Alcohols—Little Known Method for the Detection of. M. recommends the method of Whitemore and Lieber (*Ind. Eng. Chem., Anal. Ed.*, 7 (1935), 127) as a practical and quick method for the pharmacist to identify and determine alcohols. The alcohols in the presence of carbon disulfide and potassium hydroxide produce a xanthogenate. These compounds when titrated with iodine are converted into dixanthogens and the iodine used is dependent upon the molecular weight of the alcohol portion in the xanthogenate. The alcohol may be characterized accurately by the iodine number and the melting point of the xanthogenate. The alcohol (as free as possible of water) is warmed with the alkali and, after cooling, add alcohol-free ether and with vigorous shaking, small amounts of carbon disulfide. Filter off the precipitate which forms immediately, by suction, wash with ether or petroleum ether and purify by recrystallization from anhydrous and alcohol-free acetone or reprecipitation with ether. After drying, dissolve 0.15–0.25 Gm. accurately weighed in 200 cc. water and titrate after the addition of starch solution with 0.1*N* iodine to a blue color. In practice M. states that the original liquid may be used and even if two alcohols are present in the preparation, fractional distillation is not necessary; also small quantities of water do not interfere since the xanthogenate will form and the portion dissolved in the water can be salted out by the addition of an excess of alkali hydroxides. Further advantages of the method are discussed. The following table is given:

Xanthogenate of	Iodine Used Mg.	M. P. C.	Xanthogenate of	Iodine Used Mg.	M. P. C.
Methyl alcohol	869.0	195–215	Sec. hexyl alcohol	587.5	Decomp.
Ethyl alcohol	793.0	215.3	Cellosolve	622.0	185.7
N-propyl alcohol	729.0	205.7	.....	...	199
N-butyl alcohol	675.0	223.9	Cylcohexanol	593.0	Decomp. 242.0
N-amyl alcohol	628.0	225.0	Monoethyl ether ethylene glycol	668.0	202.5
Tetrahydrofurfural alcohol	587.5	213.2	Monobutyl ether ethylene glycol	547.0	167.9
Sec. propyl alcohol	729.0	Decomp. 236.0	Carbitol	512.0	.....

Xanthogenate of.	Iodine Used Mg.	M. P. C.	Xanthogenate of.	Iodine Used Mg.	M. P. C.
Sec. butyl alcohol	675.0	244.1	Monobutyl ether	.....	.....
Sec. amyl alcohol	628.0	211.7	Diethylenegylcol	460.0	.....
.....	...	...	Furfuyl alcohol	599.0	154.4
.....	...	...	Allyl alcohol	738.0	Decomp. at 178.

WALTER MEYER. *Apoth. Ztg.*, 52 (1937), 1440–1441. (H. M. B.)

Arsenic Compounds—Pharmaceutically Important. II. In the D. A. B. VI method of testing Liquor Kalii Arsenicosi and Acidum Arsenicosum, the solution of As_2O_3 is insured by means of ammonia. This contribution discusses the reaction when ammonia is so used, the compounds cyclohexylammonium metarsenite and its metarsenic acid complex (formed when hexahydroaniline is used instead of ammonia), and the compound ammonium chloride arsenous oxide.—K. BRAND and ERWIN ROSENKRANZ. *Pharm. Zentralhalle*, 78 (1937), 685; through *Squibb Abstr. Bull.*, 11 (1938), A-347. (F. J. S.)

Arsenic and Antimony—Determination of, in Organic Compounds and Mixtures. Schukle and Villecz have published a method for determining arsenic in organic compounds (*Z. anal. Chem.*, 76 (1929), 81–103). After the destruction of the organic matter, the trivalent arsenic is titrated with potassium bromide and potassium bromate. The same reaction can be used for the determination of antimony. Moreover, it is easy to separate arsenic from antimony by taking advantage of the fact that arsenic trichloride is volatile in a stream of hydrochloric acid gas. Thus the distillate can be titrated bromometrically for arsenic and the residual liquid titrated for antimony. The method of destroying organic material varies according to the nature of the sample. Further details are given concerning the method and the results of about 40 experiments are tabulated, with particular attention to the analysis of tartar emetic and neoarsphenamine.—E. SCHULEK and R. WOLSTADT. *Z. anal. Chem.*, 108 (1937), 400–406; through *Chimie & Industrie*, 38 (1937), 932. (A. P.-C.)

Arsenobenzene Preparations of the Neoarsphenamine Type—Estimation of Arsenic and of Total and Volatile Sulfur as a Means of Controlling. For estimating arsenic the method of Schulek and P. v. Villecz (*Z. anal. Chem.*, 76 (1929), 81–103) is recommended. For total sulfur the authors resort to oxidation in a Kjeldahl flask with concentrated nitric acid followed by treatment with 30% hydrogen peroxide, and finally with concentrated hydrochloric acid. Since oxalic acid may result from possible sugar-like vehicular matter, a further oxidation must be effected, decinormal potassium permanganate; excess of this reagent is eliminated with hydrogen peroxide, the solution is neutralized with ammonia (using methyl red indicator), and the sulfate precipitated by the method of Winkler. In estimating the volatile sulfur, a distillation apparatus is illustrated, in which the sample is heated with 80% phsophoric acid; the volatilized formaldehyde, sulfur dioxide, sulfur and hydrogen sulfide are received in a mixture of potassium hydroxide solution and saturated bromine water. The sulfate in the distillate is then treated by the Winkler method.—E. SCHULEK and L. S. SZLATINAY. *Arch. Pharm.*, 275 (1937), 268–275; through *Chimie & Industrie*, 38 (1937), 931. (A. P.-C.)

Bismuth—Determination of, by Means of Antipyrine-Methyleneamine. To the bismuth solution add successively acetic acid, potassium iodide until the precipitate redissolves, and then drop by drop a saturated alcoholic solution of antipyrine-methyleneamine, heat 10 to 20 minutes on the water-bath (the color of the precipitate turns to orange red), filter, wash with alcohol saturated with the double salt and then with a little pure alcohol, dry at 105° C. to 110° C. The composition of the precipitate corresponds to the formula $[(C_{11}H_{11}N_2OCH_2)_3N]_2.3HBiI_4$; the factor is 0.18566. The reaction is sensitive to 1:200,000 and can be used as a spot test for the detection of bismuth.—S. TAKAGI and Y. NAGASE. *J. Pharm. Soc. Japan*, 56 (1936), 74–76; through *Chimie & Industrie*, 38 (1937), 31. (A. P.-C.)

Bismuth—Determination of, by Means of Potassium Chromium Thiocyanate, $K_3[Cr(SCN)_6]$. Bismuth is precipitated as bismuth chromium thiocyanate, $Bi[Cr(SCN)_6]$ when a 10% solution of potassium chromium thiocyanate is added to a 0.3–1*N* solution of bismuth in nitric acid or sulfuric acid. The residue is transferred to a frit crucible, washed with cold water and dried at 120–130° until constant weight. Conversion factor = 0.34295. The chromium contained in the residue may be transformed also to chromate by oxidation and the latter determined titrametrically. This bismuth determination may be carried out in the presence of alkali metals, alkaline-earth metals and of the metals of the sulfur-ammonium group.—SCHERING A.-G., special print; through *Squibb Abstr. Bull.*, 11 (1938), A-293. (F. J. S.)