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PHARMACEUTICAL ABSTRACTS

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ABSTRACTORS

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Antiseptics—Bactericidal Properties of Commercial. In a further study of the effect of p_H on the bactericidal properties of commercial antiseptics, tests have been made on adjusted solutions of Amphyl, Chlorazene, gentian violet, Listerine, Lysol, malachite green, mandelic acid, Mercurochrome, Mercurophen, methylene blue, Pepsodent antiseptic, potassium dichromate, potassium permanganate, sodium nitrate, zinc sulfate, Zonite and Sulphonmerthiolate. *Escherichia coli* and *Staphylococcus aureus* were used as test organisms, over a p_H range of 3 to 8 and on the unadjusted solutions of the antiseptics. The bactericidal activity of Chlorazene, gentian violet, Listerine, Lysol, malachite green, mandelic acid, Pepsodent antiseptic and potassium permanganate, is definitely enhanced by an increase in the hydrogen ion concentration of the solution which seems to indicate that the hydrogen ion effect may be independent of the molecular structure of the antiseptic. Mercurochrome, Mercurophen and the zinc sulfate solutions were tested only as the unadjusted solutions. Negative results were obtained for sodium nitrate in the concentrations tested. These results check, in general, with the postulates previously reported by Degering and collaborators and by other workers. —W. A. BITTENBENDER, E. F. DEGERING, P. A. TETRAULT, C. F. FEASLEY and B. H. GWYNN. *Ind. Eng. Chem.*, 32 (1940), 996-998. (E. G. V.)

Ascorbic Acid—Concentrations in Inflammatory Lesions of. Changes in vitamin C concentration of dermal lesions similar to those observed in reactions due to diphtheria toxin were found in areas in which comparable lesions had been induced by heat. On the other hand, the dose of toxin that was associated with changes in the ascorbic acid concentration of the skin of guinea pigs did not cause such changes in rats in which it induced no inflammatory lesions. These experiments suggest that the alterations observed in the vitamin C content of the skin are associated with the development of the inflammatory lesion and are not directly influenced by the presence of diphtheria toxin. An inverse correlation (−0.52) was found between the total vitamin C in the sample of guinea-pig skin and its weight per unit of area, suggesting further that the amount of vitamin C in a localized lesion determines the degree of capillary permeability and thus controls the edema of the reaction.—C. C. TORRANCE. *J. Infect. Diseases*, 67 (1940), 53; through *Bull. Hyg.*, 16 (1941), 33. (T. C. G.)

Bacteria—Action of High Frequency Sound Waves on. A number of experiments are given which were used to make a thorough investigation of the killing action of high frequency sound on some of the commonly found bacteria.—D. LEGALLEY and G. W. PATTERSON. *Am. J. Pharm.*, 112 (1940), 373. (A. C. DeD.)

Bactericides—Process for the Preparation of. Phosphoric acid dichloride derivatives of bactericidal amino compounds containing sulfur are made to react with bactericidal amines.—PRODUITS ROCHE, SOC. ANON. Belg. pat. 435,994, Sept. 30, 1939. (A. P.-C.)

Bacterium Alkalescens—Pathogenicity and Toxicity of. Nabarro and Edward recently produced evidence suggesting that *Bact. alkalescens* is pathogenic for man. Two of the strains from the cases described by these workers have been tested for pathogenicity in mice, guinea pigs and rabbits. Large doses injected parenterally caused death, and smaller doses gave rise to diarrhea, rectal discharge and sometimes focal necrosis in internal organs. Similar effects were produced by filtrates of 10 day cultures and toxicity is probably due to an endotoxin liberated by autolysis. A gluco-lipid fraction obtained from the organisms was also toxic. It thus appears that the toxicity to animals of *Bact. alkalescens* is similar in nature and degree to that of *Bact. flexneri*, but, as the author points out, similar endotoxins have been obtained from nonpathogenic organisms such as *Chr. prodigiosum*, so that the animal experiments recorded do not assist greatly in estimating the pathogenicity of the organism for man.—D. G. EDWARDS. *J. Path. Bact.*, 51 (1940), 245; through *Bull. Hyg.*, 16 (1941), 41. (T. C. G.)

Chemical and Physical Agents—Effects of, on Cercarias of Schistosoma Mansoni. Tests *in vitro* show different results from those on experimental animals. The parasite may be unaffected by temperature increase *in vitro*, but is inactivated perhaps by the tissue juices at the same temperature in the host. It promptly accommodates itself to the host. *In vitro*, both ultraviolet light and sunlight destroy the cercaria. The cercarias resist refrigeration at 5° or 6° C. for 4 to 6 days, reviving as temperature is raised. Some have survived 12 to 13 days at low temperature. Lethal temperature is 40° C. for 6 hours, to 45° C. for $\frac{1}{2}$ hour. Ultraviolet light injures in 20 minutes and kills in 45 minutes. A p_H of 4.6 to 11.0 in solution has no effect on them. Physiological salt solution or glucose 2.7% merely hold them in a resting stage, from which they revive to attack a host. Potassium or calcium salts are toxic in concentration of 0.1 Gm. per 100 cc.—CECIL A. KRAKOWER. *Puerto Rico J. Pub. Health and Trop. Med.*, 16 (1940), 45. (G. S. G.)

Diphtheria—Alum-Precipitated Toxoid in. The results of immunization with alum-precipitated toxoid and the duration of the immunity were tested in thirty-one towns and rural communities in Hungary. This was done by making Schick tests on children vaccinated one to five years previously. The results of 22,129 Schick tests were analyzed separately for children of preschool age (2-6) and for school children (7-11). Results in both groups indicate that an adequate immunity developed after one injection and that this lasts for a sufficiently long period in the epidemiological conditions now prevailing in Hungary.—F. C. FARAGO. *Lancet*, 239 (1940), 68. (W. H. H.)

Dust-Borne Bacteria—Reduction of, by Treating Floors. Viable streptococci can be recovered from the air of rooms in which blankets artificially infected with streptococci have been beaten. Streptococci retain almost their full virulence in blankets for four weeks. Sweeping a dry dusty floor redistributes into the air a large proportion of the bacteria deposited on it, but the application of crude liquid paraffin before sweeping greatly reduces the aerial contamination. Ward floors should therefore be "sticky" rather than highly polished.—M. VAN DEN ENDE, D. LUSH and D. G. EDWARD. *Lancet*, 239 (1940), 133. (W. H. H.)

Endemic Typhus Fever—Recent Extension in the Southern United States of. During the last 10 years the incidence of endemic typhus fever has increased rapidly in the Atlantic and Gulf states from North Carolina to Texas. In most states more cases were reported in 1939 than in any previous year. The increase in number of cases has occurred mainly in the large cities. The most highly endemic centers are in southern Georgia, southeastern Alabama and southeastern Texas. Savannah, Ga., reported more cases in 1939 than any other city. Virginia and Maryland have reported very few cases of typhus since the discovery of Rocky Mountain spotted fever in these states. In order to prevent further spread of the disease it will be necessary to institute more vigorous rat control programs than have been carried on in the

past.—H. E. MELENEY. *Am. J. Pub. Health*, 31 (1941), 219. (T. C. G.)

Equine Encephalitis—Tests of Vaccination with Formolized Antigens. A vaccine was made of a suspension of a saline triturate of cerebrum from horses and guinea pigs sacrificed at complete paralysis. The suspension was 10% in saline with 0.4% formol. This was inactivated and sterilized. This injected subcutaneously gave complete protection to 80% of experimental infected guinea pigs. Intramuscular and interperitoneal injections are equally good. Only 10% of the horses treated survived, but this may be due to the small number used and also to the fact that injections were cerebral.—A. RIGLOS and A. ROTTGARDT. *Rev. sudamericana endocrinol. inmunol. quimioterap.*, (April 1939); through *Rev. Med. Cienc. Afin.*, 2 (1940), 282. (G. S. G.)

Escherichia Coli—Induced Slow Lactose Fermentation in. A report on the exposure (up to several days) of *Esch. coli* to metallic copper (0.1–1.0 p. p. m.) in distilled water is presented. Copper ions inhibit the ability of *Esch. coli* to ferment lactose. After exposure to copper the growth on Endo agar plates resembles atypical colonies, (*i. e.*, they are clear, smooth, glistening, from bluish through pink to red in color, and without metallic luster, resembling *Eberthella typhosa*); this was more noticcable with increased copper and more prolonged exposure. Distilled water for media preparation must be free from copper, to avoid producing such atypical *Esch. coli* results.—M. E. CALDWELL. *J. Am. Water Works Assoc.*, 32 (1940), 659–660; through *J. Soc. Chem. Ind.*, 59 (1940), 573. (E. G. V.)

Ferrets—Use of, in Laboratory Work and Research Investigation. Much miscellaneous but useful information pertaining to the use of ferrets in laboratory investigations is collected together from both published and unpublished sources. Average figures of physiological measurements and practical directions for the breeding, maintenance and handling of the animals are given. Notes on the common natural diseases and their treatment are also included. In a section devoted to artificial infections particular reference is made to the published investigations on canine distemper, human influenza and swine influenza. Finally methods of inoculation by various routes and methods for the collection of blood, urine, feces and turbinate tissue are described in detail.—N. J. PYLE. *Am. J. Pub. Health*, 30 (1940), 787; through *Bull. Hyg.*, 16 (1941), 36. (T. C. G.)

Fungicidal Testing—Comparison of Methods for. Since fungi differ morphologically and physiologically from bacteria, modifications in the usual technique for testing bactericidal and bacteriostatic substances must be employed. It is important to use a test suspension of fungi which contains the mature growth of the organism. This means that the suspension must contain the various types of spores. For *Monilia* and related species, 48 to 72 hours' incubation will produce spores, while *Aspergillus*, *Penicillium*, etc., require 72 to 96 hours. Species which produce ascospores require 10 to 14 days' growth before mature spores develop. Since most fungi do not develop normally in liquid media, test suspensions should be grown on solid media. In the author's experience, the agar plate method has proved unsatisfactory for mycologic work, except as confirmatory evidence. Glass beads should not be used in any stage of the preparation of the test suspension since they tend to injure the spores and mycelia. The author recommends growing the test culture on Sabouraud's medium and removing the growth by washing with distilled water. To break up clumps of the spores and mycelia, the suspension should be filtered through sterile gauze. The substance to be tested is diluted according to the Food and Drug Administration method and after inoculating the test organism, samples are removed with a loop at 5-, 10- and 60-minute intervals. The results are read after 72 hours' incubation at room temperature when *Monilia*, *Cryptococci*, etc., are used as the test organisms. When the dermatophytes, *Aspergilli*, etc., are used as the test organisms, the results should be observed after a week's incubation.—A. MCCREA. *J. Lab. Clin. Med.*, 25 (1940), 538. (T. C. G.)

Germicidal Preparation. Aqueous preparations of a tertiary-butyl-phenol and another germicidal phenol possess germicidal powers greater than the arithmetic sum of those of the individual components. The use of *p*-$C_6H_4Bu\gamma$.OH and *p-tertiary*-butyl-*m*-cresol with chloro-phenols and cresols is claimed.—E. KLARMANN, assignor, to LEHN AND FINK PRODUCTS CORP. U. S. pat. 2,085,318; through *J. Soc. Chem. Ind.*, 59 (1940), 94. (E. G. V.)

Germicidal Preparation—Production of. Mixed cresol in excess is condensed with C_5H_{11}.OH, the product extracted with alkali, and the soluble amylcresols are separated after acidification. *E. g.*, cresol (972) and zinc chloride (1005) are heated to 150–160° and *n*-, *iso*- or *tertiary*-C_5H_{11}.OH (528) is added with water and distilled (boiling point 145–160°/21 mm.; 474, 363, or 357 parts, respectively). The distillate is shaken with 10% sodium hydroxide (2750 parts), the clear aqueous solution spearated, and the amylcresols are separated again by acidification.—M. C. HART, assignor, to UPJOHN COMPANY. U. S. 2,082,625; through *J. Soc. Chem. Ind.*, 58 (1939), 1304. (E. G. V.)

Lactic Acid Bacteria—Growth Substances for. After a review of some pertinent reports the author outlined the expcriments which they used to show that adenine, guanine, thymine or uracil are necessary for the growth of certain lactic acid bacteria on media of known composition. Where continued growth occurs in the absence of an added supply of these compounds, its rate is greatly increased by their presence. A discussion of the results is included.—ESMOND E. SNELL and HERSCHEL K. MITCHELL. *Proc. Nat. Acad. Sci. U. S.*, 27 (1941), 1–7. (W. T. S.)

Lauryl Sulfate Tryptose Broth—Detection of Coliform Organisms with. Most of the media in common use for the detection of coliform bacteria in water and milk contain a dye or other ingredient intended to supress the growth of the gram positive organisms. However, these substances also surpress the growth of the gram negative bacteria to a varying degree. By the addition of tryptose to the medium, the authors have been able to stimulate the growth of the so-called "slow-lactose fermenters" which are suppressed by the test media in common usage. The authors also found that by the addition of some surface tension depressant to the medium the growth of the gram positive organisms was inhibited without affecting the growth of the desired gram negative organisms. After a study of a number of these depressants, sodium lauryl sulfate (Duponol W. A. Paste or Nacconol N. R. F. S.) was selected as being best suited for the purpose. Comparative studies with the lauryl sulfate tryptose broth and other standard media indicated the value of the new medium since gas production in this medium invariably gave a confirmatory test.—W. L. MALLMANN and C. W. DARBY. *Am. J. Pub. Health*, 31 (1941), 127. (T. C. G.)

Measles—Biologic Prophylaxis of. Measles is very contagious and brief contact with a person so infected can spread the virus by coughing, sneezing or talking. Immunity is procured without suf-

fering the infection by vaccination with (1) convalescent serum (2) extract of placenta (3) serum from navel cord and (4) serum from adults who have had measles many years before. It is recommended that blood from any patient suffering from measles, if he is free from syphilis, leprosy, tuberculosis and malaria should be used to form a "bank" of convalescent serum. Blood from cord and placenta of healthy women who have previously had measles may also be added to the bank. Children exposed to, or ill with, measles can be treated with serum from brothers, sisters or parents who have previously had the infection.—JUAN F. R. BEJARANO. *Rev. Med. Cienc. Afin.*, 2 (1940), 682. (G. S. G.)

Meningococcus—Enhancing Action of Egg Yolk on Virulence of, for Mice. Emulsions of egg yolk of certain viscosity have been found to exert an enhancing effect on the virulence of two freshly isolated strains of meningococcus for white mice when the proper amount of egg yolk was employed and the intraäbdominal route was used for inoculation. As little as 10 organisms were able to kill white mice in 16–48 hours.—K. H. PANG. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 848. (A. E. M.)

Metallic Mercury—Physicochemical Nature of the Bactericidal Action of. When very pure mercury is shaken with very pure water in a Pyrex flask in the presence of air enough mercury dissolves to make the solution bactericidal. A faint test for mercury can be obtained with diphenylcarbazide. A drop of mercury added to a test-tube of bacterial culture kills the bacteria if air is admitted, but not in the complete absence of oxygen.—M. LISBONNE, R. SEIGNEURIN and G. RENOUX. *Compt. rend. soc. biol.*, 131 (1939), 697–699; through *Chimie & Industrie*, 42 (1939), 1023. (A. P.-C.)

Nicotinamide and Related Compounds—Role of, in the Metabolism of Certain Bacteria. With glucose as a substrate the respiration (or reduction of methylene blue) by dysentery bacilli grown on a medium deficient in nicotinamide can be stimulated not only by the addition of diphosphopyridine or triphosphopyridine nucleotide but also by the addition of nicotinamide, nicotinic acid, methyl nicotinate and other derivatives of nicotinic acid. The stimulation produced by coenzymes is not as great as that produced by an equivalent amount of nicotinamide but the activity of the coenzymes is increased by autoclaving and then becomes essentially equal to their nicotinamide content. Methyl nicotinate is slightly more active than nicotinamide. Nicotinic acid is less active than the amide but becomes more active during the course of the experiment, indicating a possible synthesis of the amide from the acid. When cells of *Proteus vulgaris* grown on a medium deficient in nicotinamide are used, their respiration with glucose as a substrate is stimulated by the same compounds which stimulate the respiration of the dysentery organism; but if lactate is substituted for glucose only intact diphosphopyridine nucleotide will stimulate respiration. All the nicotinic acid derivatives which stimulate the oxidation of glucose by the dysentery organism also stimulate the oxidation of glucose monophosphate and glutamate. *Proteus* behaves toward glutamate as it does toward lactate but is unable to oxidize glucose monophosphate in the presence of nicotinamide or any of its derivatives. The evidence presented in incompatible with the hypothesis that nicotinamide serves simply as a building block for diphosphopyridine nucleotide, triphosphopyridine nucleotide, or both, and the effects observed cannot be adequately explained by differences in rates of diffusion.—FELIX SAUNDERS, ALBERT DORFMAN and STEWART A. KOSER. *J. Biol. Chem.*, 138 (1941), 69. (F. J. S.)

4-Nicotinylaminobenzenesulfonamide. This compound, of relatively, low toxicity and suitable for the treatment of various bacterial infections, is obtained by a process involving reaction of *p*-aminobenzenesulfonamide with a nicotinyl chloride (suitably by heating in anhydrous pyridine). The purified product melts at 257° C.—TROY C. DANIELS, assignor to RESEARCH CORP. U. S. pat. 2,192,828, March 5, 1940. (A. P.-C.)

2-(*p*-Nicotinylaminobenzenesulfonamide) pyridine. This compound (consisting of white crystals that melt at about 261° C.), useful in combating streptococcal and, to some extent, pneumococcal infections, is produced by a process involving the reaction of 2-(*p*-aminobenzenesulfonamide)pyridine with nicotinyl chloride (suitably in the form of the hydrochlorides). Various operative details are described.—ELMER H. STUART, assignor to ELI LILLY & CO. U. S. pat. 2,186,773, Jan. 9, 1940. (A. P.-C.)

Patch Test Strip for Testing for Tuberculous Infection. A strip for use in the diagnosis of tuberculosis or allergic reactions consists of a strip of adhesive tape having on its adhesive one or more patches of absorbent material, such as filter paper, saturated with tuberculin or with an allergen. For the tuberculin test, alternate patches saturated with tuberculin and control bouillon, respectively, may be used. The patches may be prepared by dissolving or suspending the allergens in a fat or in methyl stearate, saturating the filter paper therewith, hardening it by cooling and then applying it to the adhesive tape.—HERMANN VOLLMER. U. S. pat. 2,190,745, Feb. 20, 1940. (A. P.-C.)

Penicillin as a Chemotherapeutic Agent. The results are clear cut and show that penicillin is active *in vivo* against at least three of the organisms inhibited *in vitro*. It would seem a reasonable hope that all organisms inhibited in high dilution *in vitro* will be found to be dealt with *in vivo*. Penicillin does not appear to be related to any chemotherapeutic substance at present in use and is particularly remarkable for its activity against the anaerobic organisms associated with gas gangrene.—E. CHAIN, M. A. JENNINGS, H. W. FLOREY, J. ORR-EWING, A. D. GARDNER and A. G. SANDERS. *Lancet*, 239 (1940), 226. (W. H. H.)

Pharyngeal Secretion of the Bee—Bactericidal Properties of the, Serving as Food for the Larvæ. The pharyngeal secretion of the bee possesses bactericidal and bacteriostatic properties. The bacteriostatic action toward *Staphylococcus aureus* and *Bacillus metiens* is greater than that toward *Escherichia coli* or *B. typhosus*. On the other hand, the bactericidal action is greater toward gram-negative organisms. The germicidal action varies with the p_H: it is already weak at p_H 6 and completely destroyed at p_H 8. Temperature exerts a definite action: at 43° C. sterilization is complete in 5 minutes; at 22° to 25° C., in 10 to 30 minutes; and at 5° C. it is not yet complete after 48 hours. The active principle can be isolated by extraction with alcohol and acetone.—C. S. MCCLESKEY. *J. Econ. Entom.*, 32 (1939), 581–587; through *Chimie & Industrie*, 43 (1940), 587. (A. P.-C.)

Phenylacetic Acid—Bacteriostatic Properties of, Effect of Ortho-Substituents on. Mineral acids are bacteriostatic, in general inversely proportional to the p_H of the solution, but organic acids are specific to a high degree. Correlations between structure, chemical and physical properties, bacteriostatic and bactericidal activity are briefly summarized. The present study has been on *o*-substituted phenylacetic acids and the bacteriostatic properties as compared with the corresponding member of the *p*-series. Experimental work is reported in some detail and results are tabulated. The *o*-substituted

derivatives and related compounds were tested against *Staphylococcus aureus* and *Escherichia coli*. A solution of 1,4-dioxan was first used as a test medium. Oxindole was more effective against *Escherichia coli* than against *Staphylococcus aureus*. None of the simple *ortho*-substituted phenylacetic acids were as effective as the acid itself. In decreasing order they were hydroxy, chloro, bromo, methyl and nitro. Phenylpropionic acid was less effective than *trans*-cinnamic or hydrocinnamic acid; furylacrylic acid was less effective than furylpropionic. Replacing an α-hydrogen of diphenylacetic acid by a hydroxyl group decreased the bacteriostatic properties. A phenyl group was superior to a furyl group and far superior to a hydrogen atom in the α-position. An iodine atom in the 2-position of *p*-nitrophenylacetic acid greatly increased its effectiveness. In all except the hydroxy derivatives that have been studied, the *para*-isomer is superior to the *ortho*-isomer.—C. F. FEASLEY, B. H. GWYNN, ED. F. DEGERING and P. A. TETRAULT. *Jour. A. Ph. A.*, 30 (1941), 41. (Z. M. C.)

Pollen Therapy—Oral. Oral pollen therapy was employed at the William Beaumont General Hospital, El Paso, Texas, in the treatment of patients with hay fever over a period of 3 years. In 154 observed cases the results have been comparable to those which would have been expected if the hypodermic method had been used. All patients except 3 came from the semiarid region of west Texas. These 3 patients were ragweed sensitive patients who were given oral treatment, using a Western ragweed extract, when under exposure to the Eastern species, and were completely relieved of symptoms. In the present-day treatment of hay fever, desensitization with oral pollen extracts cannot be entirely relied upon to supplant parenteral injections of the antigen. However, a large number of patients can be given as much relief by the oral route as by the hypodermic injections. Indeed, under certain circumstances, the oral method is the one of choice.—S. C. SCHWARTZ. *J. Lab. Clin. Med.*, 25 (1940), 566. (T. C. G.)

Quinine—Specificity of, in Staphylococcus Aureus Infections. The *Staphylococcus aureus* is the microorganism responsible for most of the infections seen by traumatic and industrial surgeons. This organism is also the cause of most of the postoperative wound infections and acute and chronic infections involving bones. Such infections contribute largely to general morbidity in industrial and traumatic surgery and specificially increase morbidities when complicating healing traumatized tissues. Infections resulting from the successful invasion of the tissues by the coccus should be accorded the consideration they deserve which is far greater than that presently given them. Few, if any, escape its invasion during a lifetime but fortunately most people are proteeted, to some degree at least, by their own antistaphylolysins and antileukocidins, the cumulative result of man's long exposure to and contact with the organism. Many factors influence the body's ability to produce or even maintain normal or average production of antibodies. Local anesthesia is commonly used in minor and major operative procedures where the *Staphylococcus aureus* is the known or suspected invading bacterial factor. Quinocaine, a local anesthetic containing 0.648% of quinine hydrobromide, offers much assistance in combating both this infection, *per se*, and the spread of the infection from its usually localized area. The quinine hydrobromide content of this longer-acting local anesthetic offers a certain degree of protection against infection in clean operative wounds, by reason of its inhibiting effect upon the growth of most pathogens and upon the *Staphylococcus aureus* in a specific manner. In the presence of such an infection this specific action is of prime importance.—D. N. INGRAM. *Clin. Med. Surg.*, 47 (1940), 278. (W. H. H.)

Sabouraud's Medium for Isolation of Pathogenic Fungi—Gentian Violet in. All mycologists have met with the fact that material seen to be loaded with mycelia and spores will not grow because of excessive bacterial contamination. Ch'in in 1938 reported that Sabouraud's medium for primary isolation containing 0.015% potassium tellurite or 0.05% cupric sulfate surpassed ordinary Sabouraud's medium because the salt suppressed the growth of bacteria but not of fungi. As late as 1912, J. W. Churchman noted the bacteriostatic effect of gentian violet. Two basic media were tested, containing different minute amounts of gentian violet, for growth of *Trichophyton* strains. Ordinary Sabouraud's medium (4% dextrose, 1% Fairchild's peptone and 2% agar) and peptone-free dextrose medium of Legge, Bonar and Templeton, with p_H values of 5.2, 5.4, 5.6, 5.8 and 6 and containing 0.001, 0.0004, 0.0002 and 0.0001% gentian violet were heavily inoculated with stock *Trichophyton* (*Trichophyton interdigitale* and *Trichophyton rosaceum*) cultures, with and without added heavy bacterial contamination and also with primary impure growths of *Trichophyton* molds arising from human infectious materials. The inoculated tubes (15 cc. of medium slanted in 25 by 150 mm. culture tubes) were kept at room temperature. Observations and records were frequently made. The dye was found to inhibit markedly the growth of skin bacteria without affecting the *Trichophyton* growth, the best results being given by a plain Sabouraud medium at p_H 5.8 prior to sterilization and containing 1 to 500,000 (0.0002%) gentian violet.—S. S. EPSTEIN and F. D. SNELL. *Arch. Dermatol Syphilol*, 42 (1940), 308; through *Bull. Hyg.*, 16 (1941), 46. (T. C. G.)

Sedimentin Index. The sedimentin index is the measurement in arbitrary units of those products of tissue destruction which when present in blood plasma cause an increase in the rate of erythrocyte sedimentation. It is equal to the logarithm of the maximum velocity of sedimentation expressed in millimeters per hundred minutes. The sedimentin index is claimed to be of greater value than the orthodox one-hour Westergren reading in the diagnosis and management of cases of pulmonary tuberculosis.—G. DAY. *Lancet*, 238 (1940), 1160. (W. H. H.)

Silver Antiseptics with and without Ephedrine—Preparation and Study of. Physicians sometimes desire to prescribe a mixture containing both silver and ephedrine for use in nasal sprays but protein silver preparations which are slightly alkaline cannot be used. Experiments were undertaken to prepare an effective silver antiseptic which would be free from the objectionable features of protein silver medicaments and of silver nitrate. Antiseptic potency was tested by the agar plate penetration method. Hydrosols of several silver salts were prepared. The more soluble the salt the larger the zone of penetration. Emulsions of silver oleate, palmitate, stearate, oxalate and succinate with, and without, ephedrine displayed reasonably good zones of penetration. Storage in amber bottles delayed darkening of emulsions. Silver oleate was made to combine with quinine but the stearate and palmitate did not react. The product of silver oleate and ephedrine in methanol decomposes when recovery from filtrate is attempted; antioxidants did not prevent decomposition. Three new soluble silver salts with antiseptic properties were prepared and sulfonation of a silver salt of an aromatic acid accomplished. Attempts to form a salt of ephedrine with silver sulfosalicylate were not

successful because of the reducing effect of the alkaloid on the silver ion. Gelatin, acacia, sucrose, urea or combinations of them added to mixtures of ephedrine and silver, increase their stability by retarding reduction of the silver. Adding an antioxidant as a stabilizing agent is unsatisfactory; also adding an oxidizing agent seems to hasten reduction of the silver.—A. SLESSER and C. B. JORDAN. *Jour. A. Ph. A.*, 29 (1940), 514. (Z. M. C.)

Smallpox—Hypodermic Method of Vaccination against. Other methods of smallpox vaccination are suggested in addition to the usual cutaneous route. Some of these intravenous as well as subcutaneous have been tried on animals with live or killed organisms in various medis. The lymph virus has been used pure and in dilutions ranging from 1:16 to 1:5000 and in doses of 0.1 cc. to 2 cc. The hypodermic route produces local reactions listed as redness, heat, pain and swelling. There are conflicting reports as to extent of immunity conferred. It may be for as long a time as by the scarification method but is probably less.—CICERO NEIVA. *Bol. Ofic. Sanit. Panamericana*, 19 (1940), 357. (G. S. G.)

Spermatoxic Vaccine—Production of Non-Specific. The testicular product for non-specific (*e. g.*, human) use as a sperm determinant and as a spermatoxic vaccine contains mammalian spermatozoa (*e. g.*, those obtained by macerating animal testicular tissues in Ringer's solution and centrifuging) which have been heated to 50–100° to render them no specific, together with a harmless antiseptic.—M. J. BASKIN. U. S. pat. 2,103,240; through *J. Soc. Chem. Ind.*, 59 (1940), 642. (E. G. V.)

Streptococcal Infection—Air-Borne. An outbreak of streptococcal infection among a group of men recovering from influenza is believed on bacteriological and epidemiological evidence to have been aerially spread. The use of aerosol to disinfect the air of the ward seemed to help the patients to get rid of the infecting streptococcus from nose and throat.—R. CRUICKSHANK and C. MUIR. *Lancet*, 238 (1940), 1155. (W. H. H.)

Sulfamethylthiazole in Experimental Staphylococcal Infections. About half the number of mice infected with staphylococci by the intraperitoneal and intravenous routes survived twenty-one days when treated for fifteen days with sulfamethylthiazole. Sulfapyridine under similar conditions was only slightly less effective. Many of the treated mice still harbored *S. aureus* in the kidneys or other organs after twenty-one days. Neither sulfamethylthiazole nor sulfapyridine given by mouth affected the course of experimental staphylococcal lesions of the skin of mice.—A. MACDONALD. *Lancet*, 238 (1940), 1157. (W. H. H.)

Sulfapyridine and Antiserum in Meningococcal Infections in Mice. A meningococcal septicemia, normally fatal, was produced in mice by intraperitoneal injection of a highly virulent group—I strain of meningococcus suspended in mucin. At various periods after infection the mice received sulfapyridine, or antimeningococcus serum, or a combination of these. The combination of drug and serum gave better protection than that obtained with the drug alone. The average ease mortality in mice treated with sulfapyridine only was 59%, whereas the giving of serum besides the drug reduced it to 26%. It is suggested that the use of antimeningococcus serum, given intravenously, as an adjuvant to chemotherapy in human cerebrospinal fever deserves further clinical trial.—C. R. AMIES. *Lancet*, 238 (1940), 999. (W. H. H.)

Sulfapyridine—Effect of, on Staphylococci and Staphylococcus Toxin. Amounts of sulfapyridine varying from 4 mg. per cc. to 0.01 mg. per cc. were incorporated in dextrose broth in order to test the *in vitro* effects of the drug on three strains of staphylococci of which the first produced both toxin and *aureus* pigment, the second toxin but no pigment and the third neither toxin nor pigment. Bacteriostatic effect was shown for all three strains and the smaller inocula of the third strain were completely killed. Sulfapyridine had no influence on the hemolytic, skin-necrotizing or lethal properties of the staphylococcus toxin.—R. H. RIGDON and P. R. FREEMAN. *J. Lab. Clin. Med.*, 25 (1940), 1125; through *Bull. Hyg.*, 16 (1941), 40. (T. C. G.)

Sulfathiazole—Clinical Experiences with. At a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine a discussion was held on the clinical experiences with sulfathiazole, or M. & B. 760 (2-(*p*-aminobenzenesulfoamido)thiazole), more particularly in the therapy of staphylococcal infections. Discussions and cases of its usage in severe staphylococcal infections, osteomyelitis and meningococcal infections were made. A complete report of the actual cases and the treatment employed is given.—J. W. TREVAN. *Brit. Med. J.*, 4146 (1940), 1032. (W. H. H.)

Sulfathiazole in Bubonic Plague. Sulfathiazole in doses of 10 mg. twice a day for ten days cures 80% of plague-infected mice when administered at the time of infection or twenty-four hours after. Still better results are obtained if the dose is increased. If treatment is begun forty-eight or seventy-two hours after infection, a dose of 40 mg. twice a day for ten days cures 80–90% of infected mice. Under experimental conditions sulfathiazole is much superior to sulfapyridine in plague and is as good as an effective antiplague serum.—S. S. SOKHEV and B. B. DIKSHIT. *Lancet*, 238 (1940), 1040. (W. H. H.)

Sulfathiazole—Staphylococcal Infections Treated with. A review of some medical experiences with sulfathiazole. One conclusion was that sulfathiazole was of little value in patients with a strong bloodstream infection. In two cases of septicemia due to infection by *S. aureus*, both having their origin in a carbuncle, the patients recovered completely after administration of the new compound. Six cases of osteomyelitis and five cases of carbuncle, which had been treated with sulfathiazole, were reported. In three of the osteomyclitis cases the condition cleared up and all the cases of carbuncle recovered. The drug made a good impression, in the rapidity of clinical improvement, in the treatment of fifteen cases of meningococcal infection.—ANON. *Pharm. J.*, 144 (1940), 375. (W. B. B.)

Sulfathiazole—Use of, as an Urinary Antiseptic. The ideal urinary antiseptic is still being searched for, one that will be effective in urine of any reaction. The complete inability of sulfanilamide to kill off *Streptococcus fæcalis* is its greatest deficiency as a superior urinary antiseptic. Sulfathiazole is bactericidal even in low concentrations for *Streptococcus fæcalis* and is effective in concentrations easily reached in the urine for most of the bacteria found in urinary infections. Specifically, it seems most active against *Staphylococcus aureus* in low concentrations. In the experiments in the present paper, it was found to be bactericidal for six of the most common bacteria found in urinary infections. A concentration of 300 mg. per 100 cc. in the urine should prove sufficient for the control of practically all infections. There was some variation in the effect of the drug at various p_H levels, particularly marked in *Streptococcus fæcalis;* it was found to be more active in alkaline urine.—H. F. HELMHOLZ. *Proc. Staff Meeting Mayo Clinic*, 15 (1940), 651; through *Abbott Abstract Service*, (1941), No. 816. (F. J. S.)

Surgical Dressings. Sterile Dressings. The author has examined the factors which influence the probability of infection during testing of originally sterile dressings which show bacterial contamination. Two methods of testing the sterilizing apparatus were used. It was found that unsterile dressings yield a variety of organisms and growth in the medium is rapid; a sterilized but accidentally contaminated dressing yields a culture which may start from a single cell, not always of rapid growth, so that no visible growth may appear on the second day of incubation.—R. M. SAVAGE. *Pharm. J.*, 144 (1940), 375. (W. B. B.)

Syphilis Control—Possibilities of, with the Intravenous Drip Technique of Massive Arsenotherapy. During the thirty years since the introduction of a specific chemotherapeutic agent by Ehrlich, syphilis has not been controlled because from 50% to 80% of all infected persons have discontinued therapy while still in the infectious stage. This is because the treatment required repeated intravenous injections at intervals of 5 to 7 days for a year or longer. The intravenous drip method consists in the administration of the arsenical in a 5% glucose solution by means of a slow intravenous drip at the rate of 30 drops per minute. The intravenous drip is continued for 10 to 12 hours a day on 5 successive days. By this means 4 to 5 Gm. of neoarsphenamine, or up to 1.2 Gm. of arsenoxide (mapharsen) are administered in 5 days. No other therapy is given. In the first series 25 patients were treated with neoarsphenamine more than 7 years ago and 15 are still under observation. In 13, the treatment is considered entirely satisfactory since the blood and spinal fluid are serologically negative and the patients remained well. In a second series, 86 patients were treated and 78 have been under observation for $2\frac{1}{2}$ years. Satisfactory results were obtained in 91% of the cases. The advantages of the intravenous drip method as compared with the longer method are outlined as follows: (1) Highly infectious persons are out of circulation until treatment is completed. (2) Upon discharge from the hospital 7 to 8 days after admission, the danger of transmitting the infection to others has been eliminated or reduced to a minimum. (3) Even though a patient may disappear from observation after leaving the hospital, a satisfactory result requiring no further treatment can be assumed to have been achieved in at least 80% of the cases. (4) The total treatment cost per patient is less than the present prolonged methods.—G. BAEHR. *Am. J. Pub. Health*, 31 (1941), 176. (T. C. G.)

Tetanus Toxoid—Value of Repeat Injections of. One cubic centimeter of tetanus toxoid, alum-precipitated and refined, can be safely injected as a secondary stimulus in subjects who had previously undergone primary immunization against tetanus by means of two injections of alum toxoid. Five to seven days elapsed before the antitoxin level of the blood serum reached the minimum protective level of 0.1 unit, following injection of this secondary stimulus ("repeat" or third dose). The injection of this third dose produced a very marked increase in antitoxin content in 7 to 30 days. The magnitude of this increase was at least 50 times as great as the control in many cases. In several cases 5.0 or more units of antitoxin were found in the serum. Following the injection of the third dose the antitoxin level was maintained above the protective level of 0.1 unit for a longer period than after the primary stimulus of two injections. The occurrence of an injury in subjects that have undergone primary immunization against tetanus requires the injection of a third dose of 1 cc. of alum toxoid.—H. GOLD. *J. Lab. Clin. Med.*, 25 (1940), 506. (T. C. G.)

Tuberculin Patch Test—Evaluation of the. The authors studied 330 children ranging in age from 4 months to 14 years. Fifty-four per cent of the children were negroes. Only eight of the children were diagnosed as tuberculous. From this study the authors concluded that the tuberculin patch test is a simple, reliable and practical test, somewhat more sensitive than the von Pirquet test and slightly less sensitive than the Mantoux test. For routine work it may be recommended as an initial test in place of the von Pirquet, and if the result is negative at the end of one week, a Mantoux intracutaneous test should be performed.—A. H. FINEMAN and G. BAIR. *Am. J. Dis. Child.*, 60 (1940), 631; through *Bull. Hyg.*, 16 (1941), 19. (T. C. G.)

Typhoid Carriers—VI Agglutination in Detection of. The authors could not confirm Bhatnager's (1938) suggestion that patients convalescent from typhoid fever whose sera show significant titers of VI agglutinins tend to become carriers. In a series of healthy typhoid contacts no correlation could be established between positive VI titers and the carrier condition (excretion of typhoid bacilli in feces or urine). The average VI titers of typhoid contacts with negative feces and urine are, however, well above the normal level of those of the population of the Sudan, but the significance of this finding is unknown. Two carriers (fecal) were discovered whose sera remained negative for VI agglutination. Before the lowest significant titer for a suspected carrier can be established, more information is required about the natural level of VI agglutinins among the general population. Since the completion of this paper another typhoid contact has been found who was VI-negative but excreting typhoid bacilli in the urine. He is a Sudanese boy, aged 12, from Omdurman, and careful inquiry by the British Public Health Inspector has failed to reveal any history of previous illness.—E. S. HORGAN and A. DRYSDALE. *Lancet*, 238 (1940), 1084. (W. H. H.)

Typhoid Typing in the Western States. Craige and Yen in 1938 devised a method of typing strains of the typhoid bacillus based on the fact that certain strains are specifically susceptible to certain strains of typhoid bacteriophage. Using this method they were able to group typhoid strains into Types *A* to *M*, inclusive, with the exception of Types *I* and *K*. Types, *B*, *D*, *E* and *F* have been further subdivided into sub-types which are indicated by numbers following the type letter. The cultures can only be typed when they are in the Vi form and hence typing must be done on the freshly isolated cultures before the Vi antigen has been lost through culture on artificial media. By this method the author was able to type 96.6% of 465 cultures obtained from 11 of the western states. The author summarizes the following uses of typing cultures of the typhoid bacillus: (1) All cases arising from a carrier will show the same type as the carrier, and therefore the same type as each other. (2) The typing of all known carriers in a given area will permit the immediate elimination of some carriers from consideration and the investigation of the activities of others when typhoid cases occur in the same district. (3) Typing of cultures from a given epidemic will usually determine whether the epidemic is due to a carrier or to sewage pollution. If all cases show the same type, a carrier is probably responsible; if a variety of types is encountered, sewage contamination is probably responsible for the outbreak. (4) Complete typing studies in a given outbreak will indicate definitely whether all sources of infection have been discovered.—A. S. LAZARUS. *Am. J. Pub. Health*, 31 (1941), 60. (T. C. G.)

Virulence Tests for Diphtheria—Importance of Suspending Fluid for. In the routine testing of

diphtheria bacilli for virulence some clinical pathologists use a 22-hour growth in broth but many English workers cultivate on Loeffler slopes and suspend in saline. Sufficient attention does not seem to have been paid to the need of a suspending solution which will not harm the bacilli or cause their rapid death. The authors were disturbed by contradictory results in virulence tests with Loeffler cultures suspended in saline. In one particular fortnight, 16 *mitis* and 3 atypical *gravis* strains failed to kill guinea pigs in three days. When retested from either primary culture or subculture growth for 22 hours on agar containing ascitic fluid and casein, 14 of the 19 strains proved virulent for animals. Plate counts showed that saline was deadly. In one experiment an initial count of a 1:5,000,000 dilution in broth was 429 and after 4 hours at room temperature 382, while the corresponding counts in saline were 5 and nil. Apparently the bacilli even during the short time they are in suspension before being injected require nutriment and a correct balance with phosphates and Ca but not Mg.—H. D. HOLT and H. D. WRIGHT. *J. Path. Bact.*, 51 (1940), 287; through *Bull. Hyg.*, 16 (1941), 38. (T. C. G.)

Vitamin B_1 and the Synthesis of Oxaloacetate by Staphylococcus. The following conclusions are given: (1) *Staphylococcus albus* and *aureus* grown on a casein acid hydrolysate or casein tryptic digest with addition of glycerol were found to be defficient in vitamin B_1. Addition of aneurin caused an increase in the rate of dismutation of pyruvate by washed suspensions of the cells. (2) Aneurin can be replaced for limited periods by oxaloacetate or fumarate. The initial effect of these substances on the rate of pyruvate dismutation is greater than that of aneurin but it falls off within about one hour, while that due to aneurin is steadily maintained. (3) Succinate, fumarate and malate are formed by *Staphylococcus* after the addition of either oxaloacetate or pyruvate. (4) These results support the view that vitamin B_1 catalyzes the formation of oxaloacetate and that this substance acts as a hydrogen carrier in the dismutation of pyruvate.—DAVID HENRY SMYTH. *Biochem. J.*, 34 (1940), 1598. (F. J. S.)

Xylenols—Germicidal Action of the Six Isomeric, and Their Monochloro and Monobromo Derivatives. The germicidal action of xylenols toward *B. coli* and *Staphylococcus pyogenes aureus* is of approximately the same order for all the isomers. On the other hand, rather large differences are noted in the halogenated xylenols. Isomers in which the halogen is remote from the hydroxyl but close to a methyl or between two methyl groups, are from 4 to 6 times more active toward *B. coli* than the isomers in which the halogen is close to the hydroxyl. In the case of *S. pyogenes aureus* the differences are even greater: 15 to 20 times for the chloro derivatives, 33 times for the bromo derivatives.—G. LOCKEMANN and K. HEICKEN. *Zentr. Bakt., Parasitenk.*, 145 (1939), 61-71; through *Chimie & Industrie*, 43 (1940), 843. (A. P.-C.)

BOTANY

Ascorbic Acid—Distribution and Concentration of, in the Potato (Solanum Tuberosum). The concentration of ascorbic acid in the leaves fluctuates considerably during the day but shows a maximum value in the early forenoon; it is on the average much greater in the leaves than in the tubers. In the tubers it reaches a maximum in August and falls quickly as the plant ripens off. During storage the value decreases until, after six months, it is only about one-third of the value at the time of harvesting. Variations in normal manuring practice do not produce significant results. There is usually a greater concentration in tubers from plants affected with severe mosaic or leaf roll than in tubers presumed to be healthy. The concentration of ascorbic acid increases from the heel to the middle or tip of the sprout; the gradient is more pronounced when sprouting has taken place in the light than when it has occurred in the dark. There is apparently no synthesis of ascorbic acid during the early stages of sprouting but rather a net loss which is greater when sprouting has taken place in the dark.—A. M. SMITH and J. GILLIES. *Biochem. J.*, 34 (1940), 1312. (F. J. S.)

Cambium, the New Wood and the Mature Sapwood of the Common Ash, the Common Elm and the Scotch Pine—Constitution of the. The woods of the common ash, common elm and Scotch pine were divided into three fractions: cambium plus differentiating xylem, newly formed wood and mature sapwood. Analyses were made of each fraction. The composition of the cambium was found to be similar to that of other differentiating tissues especially in the high pectin and relatively low lignin contents. There is some evidence that further slight changes occur in the composition of the wall after vessel differentiation is complete.—ALLAN ALLSOPP and PARASURAM MISRA. *Biochem. J.*, 34 (1940), 1078. (F. J. S.)

Colchicine Chronology. A letter on the priority in the use of colchicine as an inductor of polyploidy in plants.—LASZLO J. HAVAS. *J. Heredity*, 31 (1940), 115; through *Chem. Abstr.*, 34 (1940), 4765. (F. J. S.)

Dryopteris Felix-mas—Historical Note on the Nomenclature of. Before botanists knew much about the minute structure of plants, the laity distinguished the male and female forms, ascribing female qualities to plants of delicate form. For example, *Dryopteris felix-mas* is known as the "male fern," while a specie of a very different genus, *Asplenium felix-fœmina*, is the "lady fern" or "female fern."—ANON. *Am. Botanist*, 47 (1941), 13. (W. T. S.)

Plant Parenchyma—Action of Saccharose on. The mechanism of the dehydration of plant parenchyma tissue in contact with sugar was studied. The process is more complex than plasmolytic action alone. A variety of substances were tested for their dehydration power. Using mustard, which on contact with water develops a characteristic odor, it was shown that the sugar exercises an inhibiting action on the ferment. Dilution of the extract resulted in the formation of oil of mustard; indicating that the enzyme had not been inactivated and that the plant glucoside is present also. The exudate obtained from beets with sucrose was practieally colorless, the cell walls retaining the relatively large anthocyanin molecules of pigment as shown by microscopic observation. The compound used in the dehydration affects the results obtained. When sucrose is replaced by a salt the exudate is colored deep red. The plasmolysis by sucrose and other sugars is simple and reversible and the cell wall retains its semipermeable character. A true exosmosis is obtained with plasmolyzing substances which modify the protoplasm as, for example, KCNS.—R. OLIVET and M. A. MIRIMANOFF. *Schweiz. Apoth.-Ztg.*, 78 (1940), 429. (M. F. W. D.)

Seaweeds—Japanese, Inorganic Constituents of Some. The inorganic elements in the ashes of some seaweeds from places near Kyoto have been detected by means of ordinary chemical analysis and spectroscopic method.—MASAYOSI ISIBASI and RYOTARO SAIHARA. *J. Chem. Soc. Japan*, 61 (1940), 277; through *Chem. Abstr.*, 34 (1940), 4763. (F. J. S.)

Soy Beans—Metabolic Studies on Germinating. I. General Metabolic Changes in the Germinating Soy Bean. Analyses of soy beans during germination in the absence of light show that total dry matter, fat and protein decrease whereas fiber, free sugar and amino-N increase. Total mineral matter, polypeptide- and total-N remain constant within the limits of experimental error. Acid hydrolyzable carbohydrate shows marked fluctuations which may be related to certain morphological changes.—W. Y. LEE. *J. Chinese Chem. Soc.*, 6 (1938), Nos. 1 and 2, 15–22. (F. J. S.)

Tissue Proteins of Some Cryptogams. The Amide, Tyrosine and Tryptophan Contents. Partial analyses of protein preparations from the photosynthesizing tissues of one member of the bryophyte division (*Lunularia cruciata* of the class *Hepaticæ*) and two members of the pteridophyte division (*Pteridium aquilinum* of the class *Filicales* and *Selaginella* sp. of the class *Lycopodiales*) have been made. The amide, tyrosine and tryptophan contents as percentage of the protein-N were, respectively, 5.52, 2.43 and 1.70 for *Lunularia cruciata*, 4.92–5.14, 2.06–2.20 and 1.13–1.19 for *Pteridium aquilinum*, and 5.31, 2.60 and 1.43 for *Selaginella* sp. These are of much the same magnitude as values obtained with leaf proteins of the angiosperms in the spermatophyte division, but the tryptophan contents of the *Pteridium aquilinum* preparations are rather lower than any encountered heretofore. The amide, tyrosine and tryptophane contents of protein preparations from leaves of *Trifolium subterraneum* were 5.29–5.39, 2.53–2.64 and 1.62–1.75, respectively, as percentage of the protein-N and the amide content of the petiole protein was 5.91.—J. W. H. LUGG. *Biochem. J.*, 34 (1940), 1549. (F. J. S.)

Vitamin B_6 and the Rooting of Cuttings. Vitamin B_6 in concentrations of 1:1,000,000 and 1:5,000,000 parts of water, was applied to cuttings of 15 species of plants, some of which were also treated with growth substance (methyl indolebutyrate or indolebutyric acid). Rooting was increased in most cases as a result of the vitamin addition and did not necessarily depend on a previous addition of growth substance. Leaf retention was improved in some species.—V. T. STOUTEMYER. *Am. Nurseryman*, 71 (1940), No. 6, 11, 32; through *Chem. Abstr.*, 34 (1940), 4767. (F. J. S.)

Wheat Glutenin—Absorption Spectra of. The wave-length of the absorption spectrum of wheat glutenin solution was maximum at 282 mμ and minimum at 272 mμ. The light-absorption coefficient per nitrogen equivalent in the maximum and minimum points were, respectively, 104.3–147.0 and 73.0–102.6 according to the varieties of wheat.—KINSUKE KONDO and HISATERU MITUDA. *J. Agr. Chem. Soc. Japan*, 16 (1940), 159; through *Chem. Abstr.*, 34 (1940), 4763. (F. J. S.)

Yeast Cells—Effect of Ultraviolet Light on Living. Exposure of living yeast cells to ultraviolet light results, without disintegration of the cells, in the liberation of large amounts of nitrogenous material into the surrounding medium. This material has the property of stimulating yeast growth to a marked degree. Although the medium contains adenine nucleotide derivatives, these are not necessarily the growth promoting principles.—J. N. DAVIDSON. *Biochem. J.*, 34 (1940), 1537. (F. J. S.)

CHEMISTRY

GENERAL AND PHYSICAL

Anesthetics—Physicochemical Properties of Local. II and III. Dialysis of Novocaine Hydrochloride through Cellophane. The apparatus consists of two Pyrex halves of a U-tube with ground connections at the bend. The interior diameter is 3 cm. and the capacity is 400 cc. The tightness of the system is assured by an adjusting screw holding the cellophane membrane and the two ground parts of the U-tube. Vertical agitators moving at the rate of 120–130 movements per minute are inserted into each arm of the tube. Four tubes were used simultaneously to insure identical external conditions. The effect of time and concentration on the passage of novocaine through a membrane of No. 400 cellophane were noted. The following summary is given: (1) The methods of Abildgaard and Cheramy for the determination of the novocaine gave similar results. (2) The combined weights of the different fractions of novocaine indicated very little adsorption of the compound on the walls of the tube or on the membrane, or very little loss of solvent by evaporation. (3) Results in different experiments are very close, indicating that the external temperature change does not affect the action to the extent that it affects free diffusion. (4) Results obtained by determination of the base and by determination of chloride are close enough to indicate the hydrochloride molecule dialyzes intact. (5) The amounts of novocaine having passed through the cellophane show a regular increase toward a maximum with a slowing of the passage as an equilibrium is established. (6) Addition of sodium chloride and hydrochloric acid sharply reduces the amount of novocaine passing through cellophane. (7) Elevation of temperature sharply augments passage with the increase being greater between 2° and 20° than between 20° and 40°. (8) The thickness of the cellophane plays an important part: the speed of passage varying inversely with the thickness.—J. REGNIER, A. QUEVAUVILLER and A. FIEVRE. *Bull. sci. pharmacol.*, 47 (1940), 15–19. (S. W. G.)

Electrode—Glass. In the glass electrode the potential difference at the glass-liquid interface is proportional to the p_H of the liquid. The glass of the electrode itself has a slight e. m. f., between the inside and the outside surfaces, termed the asymmetric potential; this is compensated by adjusting the internal circuit of the potentiometer. Calibration of the instrument is effected by adjusting this compensation so that a known buffer gives the required reading on the scale. The author found that after calibrating the instrument, determining the p_H of certain protein solutions, and then immediately retesting the same buffer, a different value for the buffer was obtained. Coated electrodes may pick up secondary films from solutions which do not normally cause this error.—G. E. SHAW. *Pharm. J.*, 144 (1940), 375. (W. B. B.)

Fine Powders—Size and Surface of. In discussion of Carman's paper it is shown that Rosin and Rammler's law of size distribution can be successfully extended to pulps which are mixtures of quartz and shale by assuming that each constituent individually obeys the law.—J. C. VOGEL. *J. Chem. Met. Mining Soc. S. Africa*, 40 (1940), 272–277; through *J. Soc. Chem. Ind.*, 59 (1940), 504. (E. G. V.)

Gelatinous Alumina—Activated. Preparation and application is discussed.—ANON. *Perfumer. Essent. Oil Record*, 32 (1941), 8. (A. C. DeD.)

Organic Liquids—Fine Particle Suspensions in. The sedimentation volumes of glass spheres, 5 to 15 microns in diameter, were determined in water and in a series of organic liquids. The sedimentation volumes in the organic liquids are identical with that in water or approach this volume as a minimum, as the system is dried more and more intensively. Flocculation of the particles causes the increase from the minimum value. The presence of water dissolved in the liquid and adsorbed on the par-

ticles produces this flocculation. The interfacial tension of the organic liquid against water is indicative of the tendency toward flocculation and the difficulty with which the minimum value is reached. In some cases the sedimentation volume is proportional to the water content of the organic liquid, and in others the liquid must be nearly saturated before flocculation takes place.—C. R. BLOOMQUIST and R. S. SHUTT. *Ind. Eng. Chem.*, 32 (1940), 827–831. (E. G. V.)

Particle Size in Powdered Materials—Graph for Evaluation of.—A. GIANNONE. *Atti X Congr. Internaz. Chim.*, IV (1938), 650–656; through *J. Soc. Chem. Ind.*, 59 (1940), 504. (E. G. V.)

Pectin Jelly Formation—Quantitative Basis of, in Relation to p_H Conditions. The electrolytic dissociation of pectins in dilute solution was investigated. The dissociation "constant" was found to diminish with increasing degree of neutralization with alkali, from a value of about 5×10^{-4} for the free acid condition in a concentration of approximately 1 Gm. per 100 Gm. water. Dilution caused a small decrease in the value of K at a given p_H or degree of neutralization. No significant alteration of the dissociation "constant" was caused by boiling a pectin solution for one hour, or by enzymic deesterification, or by admixture with citric acid. From the results of determinations of the upper limit of p_H for the jellying of pectin-sugar mixtures on the assumption that jelly formation is only participated in by molecules in the non-ionized condition, it is shown that the concentration of such non-ionized pectin must exceed a certain solubility, or saturation limit, which varies with the total solids concentration of the mixture. It is necessary to assume that in general the pectin which is ionized and incapable of jellying has a certain proportion only of its acid groups dissociated. This proportion varies with the nature of the buffer salt present (potassium or sodium), and with the degree of esterification of the pectin. The strengths of jellies from any one pectin, with a given buffer salt, were found to be proportional to the amount of the excess of non-ionized pectin above the limit of its solubility. For different pectins, the ratios of jelly strength to amount of jellying substance differed. Many of the phenomena of the jellying of pectins, especially in regard to p_H conditions, can be accounted for by the proposed hypothesis.—C. L. HINTON. *Biochem. J.*, 34 (1940), 1211. (F. J. S.)

Physical Properties as a Basis for the Identification of Solid Stuffs. A report of the successful use of old recognized methods, centered about the polarizing microscope, by individuals who are definitely not crytallographers is given. The definiteness of the methods and the time-saving effected are stressed. The possible desirability of including in the Pharmacopœia the measurements listed and the need for more complete tabulations are mentioned.—C. J. CAMPBELL. *Am. J. Pharm.*, 113 (1941), 12. (A. C. DeD.)

Powders—Measuring Average Particle Diameter of. A self-calculating apparatus for direct determination of surface-weighted average particle diameter of powders has been designed and subjected to practical tests. It consists of a device for determining the average or effective particle diameter of a powder as deducted through Carman's specific surface equation from its permeability to air when the sample is formed into a compact bed. The operation of the device is remarkably convenient, simple and economical of both time and material. The automatic-calculating feature reduces to a minimum the work of a determination and the chances of making mistakes. In precision and accuracy the method employing this apparatus compares favorably with the usual methods of granulometric analysis for powders.—E. L. GOODEN and C. M. SMITH. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 479–482. (E. G. V.)

Rochelle Salt (Sodium Potassium Tartrate Tetrahydrate)—Crystal Structure of. The complete crystal structure of this salt has been determined by the Fourier and Patterson methods and some of the difficulties involved were discussed. The tartrate molecule was found to lie approximately in three planes, the planes of each half of the molecule being inclined at 60° to the plane of the carbon atom. The tartrate molecules are bonded to sodium and potassium atoms both directly and through the medium of water molecules. It is necessary to suppose that one of the carboxyl groups of the molecule is also a dipole if the water molecules are to preserve their customary tetrahedral "bonding." A reversal of the continuous chain of carboxyl-water-water dipoles is a possible explanation of the peculiar dielectric properties of the salt.—C. A. BEEVERS and W. HUGHES. *Proc. Roy. Soc. (London) B.*, 129 (1940), S 72. (W. T. S.)

Solids—Electrostatic Separations of. Basic principles and their application in electrostatic separation are discussed. Electrostatic separators are classified according to the electric property of the solid utilized—*i. e.*, conductance, contact potential, dielectric constant, dielectric hysteresis and proelectric polarization. Only the conductance method has been applied to any important extent. The progress of electrostatic separation has been retarded by several factors, particularly the lack of selectivity. Selectivity can be increased by surface cleaning, by preconditioning silicate minerals with hydrogen fluoride gas and basic minerals with organic acids and by the use of various surface active agents and oils. Although now seldom used, electrostatic separation has diverse applications in the ore dressing, chemical and food industries. Through mechanical improvements, including better insulation, and a better understanding of the principles and limitations, this method is coming back into increased use. By utilization of conditioned air, both this and the contact potential method of separation promise a wider field of usefulness.—F. FRAAS and O. C. RALSTON. *Ind. Eng. Chem.*, 32 (1940), 600–604. (E. G. V.)

Solids—Mixing of. Mixing of a Binary System of Two Sizes by Ball-Mill Motion. The mixing of particles of calcium carbonate in a rotating horizontal cylinder has been investigated. The theory of packing and mixing of binary system is considered. The specific volume of the bed is used as a criterion of the mixing effect, and the variation of the degree of mixing with the speed of rotation of the cylinder is found.—Y. OYAMA. *Sci. Papers Inst. Phys. Chem. Research Tokyo*, 37 (1940)., 17–29; through *J. Soc. Chem. Ind.*, 59 (1940), 504. (E. G. V.)

Suspensions—Sedimentation of. Suspensions of calcium carbonate and basic aluminum sulfate with barium sulfate were studied under two- to three-fold variation of height and over a seven- to seventeen-fold variation in concentration of solids. In the runs where height was varied, the lines of the constant-rate period were parallel and this period terminated at points on a line through the origin of the height *vs.* time period. In the falling-rate period a line through the origin intersected the curves at points of similar tangency and at heights proportional to the original height of the suspension. From the settling data at one height it becomes possible to predict settling data at other heights. In the case where height was fixed and concentration varied, the height during the falling-rate period was shown to be a power function of time and a logarithmic plot revealed that the lines were parallel

for the several concentrations until such time as the sediment assumed a rigid structure. After that the lines took on new slope but still retained their parallelism, and the locus of these points of change lay on a straight line. The constant-rate period was considered from the viewpoint of the displacement upward of liquid as the solid settled The relation of the existent solid fraction to the absolute settling rate—that is, the observed settling rate corrected for the upward displacement of liquid—takes the form of a curve on a double logarithmic plot approaching asymptotically to a unit solid fraction and to a Stokes-law settling velocity. From the type of relations proposed it is possible to predict the settling characteristics of a suspension from limited data on suspensions of the same material at other concentrations.—L. T. WORK and A. S. KOHLER. *Ind. Eng. Chem.*, 32 (1940) 1329–1334. (E. G. V.)

INORGANIC

Aluminum in Place of Iron. Aluminum may replace iron as a "support" of iodine in the preparation of potassium iodide by double decomposition. This substitution simplifies the operation. To obtain potassium iodide by double decomposition between a solution of Al_2I_6 and K_2CO_3 the best concentrations are $0.8M$ for Al_2I_6 and $1M$ for K_2CO_3. The lower atomic weight of aluminum necessitates less than half of the aluminum with respect to iron. Also powdered aluminum is better conserved than powdered iron.—PEDRO G. PATERNOSTO. *Rev. facultad cienc. quím.*, 14 (1939), 31. (G. S. G.)

Ammonia—Titration of, in Presence of Boric Acid. A study of the conditions for the titration of ammonia in boric acid solutions and utilizable in the macro-, semimicro- and micro-Kjeldahl procedures, using methyl red indicator.—E. C. WAGNER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 771–772. (E. G. V.)

Calcium Hypochlorites of High Titre and Their Preservation. Data of chlorine losses over several months recorded for ordinary bleaching powder and for bleaching powders (Jav, Chlorfix, Perchlorfix, Perfix) of high chlorine content show that the latter, especially Perfix, are more stable than is the former, and that maximum stability is attained by low temperature and protection from light. Accelerated aging tests (heating in darkness for 360 hours at 40°) show that while ordinary bleaching powders sustain high losses of chlorine, the powders of high chlorine content, especially Perfix and Perchlorfix, lose a much smaller per cent of chlorine. For Perfix, coke ash, sand and talc are the best diluents. Sodium carbonate, calcium carbonate and especially sodium bicarbonate, sawdust and peat lead to considerable losses of chlorine.—A. GUILLAUME and Y. NICOLAS. *Ann. chim. anal.*, 21 (1939), 261–266; through *J. Soc. Chem. Ind.*, 59 (1940), 128. (E. G. V.)

Carbon Dioxide—Generator for Pure. A modified Poth generator is described.—W. H. RAUSCHER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 694–695. (E. G. V.)

Distilled Water—Simple Apparatus for the Preparation of. The apparatus is made of the simplest glass parts, and can prepare one liter of distilled water per hour. It is very inexpensive to install and operate, operates by electricity (about 0.528 kw. per hr. is used), has an automatic switch, the produced distilled water p_H is 7.1–7.15, qualitative reactions with silver nitrate and barium chloride are always negative. The water begins to boil 3–5 minutes after the electric current is turned on. The apparatus is invaluable for a small-scale laboratory. —G. A. BABICHEV. *Lab. Prakt. (U. S. S. R.)*, 1 (1939), 20–23; through *Chem. Abstr.*, 33 (1939), 6657. (E. G. V.)

Hydrogen Peroxide—Manufacture of. *p*-Hydrazotoluene is used as the reduced intermediate subjected to oxidation in the manufacture of hydrogen peroxide by cyclic oxidation and reduction of an intermediate in a solvent, such as benzene, in which hydrogen peroxide is of limited solubility.—JOHN C. MICHALEK and EDWARD C. SOULE, assignors to MATHIESON ALKALI WORKS, INC. U. S. pat. 2,178,-640, Nov. 7, 1939. (A. P.-C.)

Hydrogen Peroxide—Production of, by the Explosion Method.—M. V. POLYAKOV, E. V. LIFANOV and D. S. NOSENKO. *Acta Physicochim. U. R. S. S.*, 10 (1939), 441–451; through *Chem. Abstr.*, 33 (1939), 5764. (E. G. V.)

Sodium Borate Compound—Preparation of. Aqueous borax is treated with sufficient hydrochloric acid to convert it into $Na_6B_{16}O_{27}$, which crystallizes with 10 molecules of water when the solution is saturated with sodium chloride at greater than 35° (51°).—H. B. SUHR, assignor to AMER. POTASH AND CHEM. CORP. U. S. pat. 2,096,266; through *J. Soc. Chem. Ind.*, 59 (1940), 525. (E. G. V.)

Sodium Thiosulfate Solutions—Preparation of Stable. Small amounts of chloroform prevent the decomposition of the sodium thiosulfate stored in rubber-stoppered bottles. Solutions of approximately $0.05N$ or less should be stored in brown glass, rubber-stoppered bottles. Sterile sodium thiosulfate solutions that have a p_H of 6.2 or more maintain their titer over a long period of time.—J. L. KASSNER and ESTHER E. KASSNER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 655. (E. G. V.)

ORGANIC

Alkaloids

Alkaloids—Behavior of Certain, in Filtered Ultraviolet Light at Different Hydrogen-Ion Concentrations, and Experience in the Evaluation of Capillary Pictures. The results obtained in a study of berberine derivatives and of papaverine, rheadine and the chelidonium bases of the naphthophenanthridine series are reported and discussed.—W. AWE. *Pharm. Zentralhalle*, 80 (1939), 17–21, 51–54; through *Chimie & Industrie*, 42 (1939), 1028. (A. P.-C.)

Alkaloids—Toxicological Investigation of Certain. Data have been presented regarding the stability of cocaine hydrochloride, strychnine sulfate, hydrastine hydrochloride, atropine sulfate and brucine sulfate under a variety of toxicological conditions.—B. A. ACENA and L. W. RISING. *Am. J. Pharm.*, 112 (1940), 357. (A. C. DeD.)

Arthrophytum Leptocladum M. Pop.—Alkaloids of. About 0.7% of alkaloids was extracted from the above-ground portions of *Arthrophytum leptocladum* M. Pop. From the mixture there was isolated a new alkaloid, $C_{15}H_{16}N_2$, named leptocladine. It is a monoacid base that crystallizes from xylene in the form of rectangular plates melting at 109° to 110° C., insoluble in water but soluble in most of the organic solvents.—N. K. Iourachevski. *J. Obchtch. Khim.*, 9 (1939), 595–597; through *Chimie & Industrie*, 43 (1940), 673. (A. P.-C.)

Berberine—Determination of, in Primary Homeopathic Tincture of Chelidonium Majus. By reduction with zinc amalgam, together with a small quantity of cadmium amalgam, there was obtained from 1500 Gm. of primary tincture 0.106 Gm. of 16,17-dihydrodesoxyberberine melting at 168° C. It can therefore be considered that berberine in small quantity is a characteristic constituent of *Chelidonium majus* and its preparations.—AWE and O. NEHRLICH. *Süddeut. Apoth.-Ztg.*, 79 (1939),

429–430; through *Chimie & Industrie*, 42 (1939), 1029. (A. P.-C.)

Cocaine in Cocaine Stovaine Mixtures—Separation and Detection of. A method for the separation of cocaine from stovaine is given. One milligram of cocaine in 100 milligrams of stovaine can be isolated and identified. The molecular structure of cocaine is not altered. Exact quantitative results are not obtained by this method.—C. MILOS. *Am. J. Pharm.*, 112 (1940), 403. (A. C. DeD.)

Ergot—Active Constituent of. The author reviews the discovery classification and the structures of the ergot alkaloids as far as known.—DOTT. SANTI. *Schweiz. Apoth.-Ztg.*, 78 (1940), 305. (M. F. W. D.)

Ergot Preparation. "Ergostetrine," a uterine strip stimulant, is obtained by mixing a predetermined quantity of defatted powdered ergot with a sufficient amount of an aqueous alkaline solution or suspension to impart an alkaline reaction to litmus, exhaustively extracting the dampened and alkaline drug with an organic solvent, concentrating the solution of the total alkaloidal bases to dryness in vacuum, then redissolving the total alkaloids in the smallest amount of acetone necessary to cause solution, adding water thereto, to cause all of the alkaloids except the desired component to precipitate, and finally discarding the precipitate and removing the solvent to obtain the desired component as a dry solid substance.—MARVIN R. THOMPSON, assignor to ELI LILLY & CO. U. S. pat. 2,192,460, March 5, 1940 (A. P.-C.)

Erythrophleum Guineense—Preliminary Studies on Bark and Seeds of. The following procedure was used to isolate the alkaloids of *E. guineense*. Extract with 90% alcohol by percolation or by decoction under a reflux condenser. Evaporate the alcoholic liquor under reduced pressure to a syrupy consistency, add magnesia and calcium carbonate to form a paste which is spread in a layer and allowed to dry for twenty-four to forty-eight hours. Powder in a mortar and extract with boiling ethyl acetate. During the concentration of the liquor a part of the alkaloids precipitate and an additional fraction may be precipitated by adding two to three volumes of petroleum ether. A yield of 0.4–0.6% of pale yellow crude alkaloid was obtained from the bark. This was separated into (*A*) (m. p. 105–106°) and (*B*) (m. p. 114–116°). A yield of 1.0–1.2% was obtained from the seeds. This was separated into (*A*) (m. p. 185–186°), (*B*) (m. p. 118–119°) and (*C*) (m. p. 122–124°). Among four Erythrophleum examined *E. Couminga* was most toxic to the guinea pig; *E. guineense* and *E. ivorense* showed analagous toxicity; *E. Fordii* was least toxic. With *E. guineense* the seeds were more active than the bark or leaves. The alkaloids exhibit cardiotonic actions but do not give certain color reactions common to digitalic substances. Saponin, catechuic tannin and phytosterol were isolated from the bark; and a strongly hemolytic saponin was isolated from the seeds.—R PARIS and M. RIGAL. *Bull. sci. pharmacol.*, 47 (1940), 79–87. (S. W. G.)

Fumariaceous Plants—Alkaloids of. XXX. Aurotesine. The alkaloid aurotensine is shown to have the same constitution as scoulerine. It is not the optical antipode nor the *dl*-form of the latter, but an addition compound of the *l*- and the *dl*-forms. Scoulerine diethyl ether and the mono-ethyl ethers of corypalmine and of isocorypalmine have been obtained in crystalline condition, thus facilitating the unambiguous characterization of the alkaloids. —RICHARD H. F. MANSKE. *Can. J. Research* (B), 18 (1940), 414–417. (W. T. S.)

Ipecac—Alkaloids of. Emetine was isolated in 1817 and was long considered the only alkaloid of ipecac. However, in the past twenty years six additional alkaloids (cephaline, $C_{28}H_{38}N_2O_4$; psychotrine, $C_{28}H_{36}N_2O_4$; ipecamine, $C_{28}H_{36}N_2O_4$; hydroipecamine, $C_{28}H_{38}N_2O_4$; methylpsychotrine, $C_{29}H_{38}N_2O_4$; emetamine, $C_{26}H_{36}N_2O_4$) have been isolated. The fusion points are: emetine 74°, cephaline 118°, psychotrine 138°, ipecamine - , hydroipecamine 138°, methylpsychotrine 138° and emetamine 156°. Cephaline may be considered structurally as a hydropsychotrine and emetine as a methyl ester of cephaline. Oxidation by potassium permanganate develops an acid with an isoquinoline nucleus. In fact, these alkaloids of ipecac appear almost as derivatives of isoquinoline and may be studied along with hyrastine and papaverine.—MANOEL JOSE CAPELLETI. *Rev. quim. farm.*, 4 (1939), 117. (G. S. G.)

Morphine in Opium—Quantitative Determination of, by the Method of the League of Nations. A criticism of the method with recommendations for a more exact estimation in the case of very small samples.—A. RIUS. *An. Soc. Esp. Fis. Quim.*, 36 (1940), 51; through *An. Farm. Bioq., Sup.*, 11 (1940), 93. (G. S. G.)

Nuphar Luteum—Alkaloids of. *Nuphar luteum* rhizomes were found to contain two new isomeric alkaloids having the empirical formula ($C_{15}H_{23}ON$) —α-nupharidine (10% of the total alkaloids) and β-nupharidine (2% of the total alkaloids). Both are colorless, odorless, viscous, and volatile with steam; they are very soluble in organic solvents, insoluble in aqueous alkaline solutions and ammonia. Physiologically, the *l*-rotatory α-isomer is twice as active as the *d*-rotatory β-isomer.—O. ACHMATOWICZ and M. MOLLOWNA. *Roczniki Chem.* 19 (1939), 493–506; through *Chimie & Industrie*, 42 (1939), 1029. (A. P.-C.)

Quinicine and Cinchonicine—Detection of. Report is made of a study undertaken to obtain satisfactory tests for quinicine (quintoxine) and cinchonicine (cinchotoxine) in preparations containing quinine and cinchonine. It was hoped also to determine minimum concentration in which detection is possible. It was found that diazobenzene sulfonic acid reagent gives reliable tests for quinicine and cinchonicine in aqueous or alcoholic solutions and in the presence of the parent alkaloid or its salts. Dinitrothiophene reagent gives reliable tests in alcoholic or ethereal solutions and in presence of parent alkaloid but not in presence of alkaloidal salts. The modified Lipkin test may be used to differentiate between quinine and quinicine and between cinchonine and cinchonicine. The modified Ball test also differentiates between quinicine and cinchonicine. The phenylhydrazine and nitrous acid tests are less satisfactory than the others.—J. W. MILLAR and S. J. DEAN. *Jour. A. Ph. A.*, 30 (1941), 52. (Z. M. C.)

Quinine—Antidotes for. I. II. III. Antidotal doses of sodium chloride were 23.9 to 28.2 and 12.6 to 16.8 times the minimum lethal dose of quinine hydrochloride and quinine dihydrochloride, respectively, in Gm. equivalents per Kg. body weight. The corresponding values for sodium sulfate were 32.6 and 44.4 and 15.78 to 210.05 times; for sodium phosphate, 4.36 to 8.15 and 0.78 to 0.84 times; and for tannic acid, 0.54 to 1.62 and 0.105 to 0.157 times.—I. SIMON. *Bol. soc. ital. biol. sper.*, 14 (1939), 131–134; through *Chimie & Industrie*, 42 (1939), 1023. (A. P.-C.)

Vallesia Glabra—Alkaloid of. The alkaloid isolated by Stuckert and Paya (Chemical Congress, Buenos Aires, 1934) is shown to be identical with aspidospermine, $C_{22}H_{30}N_2O_2$, isolated from *Aspidosperma quebracho blanca*.—M. HARTMANN and E. SCHLITTLER. *Helv. Chim. Acta*, 22 (1939), 547–549; through *Chimie & Industrie*, 42 (1939), 1026. (A. P.-C.)

Essential Oils and Related Products

Apricot Kernel Oils—Physical Properties of. Oil from almonds of *Prunus armeniaca* has d. 0.9162, freezing point −18.1°, acid value 4.5, n_D 1.469, Crismer index 75.4°, solubility in ethyl alcohol at 15°, 35.41 Gm./liter.—J. HADACEK. *Časopis Českoslov. Lékárnictva* 17 (1937), 163–166; through *J. Soc. Chem. Ind.*, 59 (1940), 463. (E. G. V.)

Artemisia Annua L. and Its Essential Oil. The air-dry plant contains water 9.7, ether-soluble 5.6, water-soluble 26.6 and ethyl alcohol-soluble substances 0.8, hemicellulose 11.6, cellulose 8.5, lignin 9.6, protein 9.3, ash 10.1 and tannides 2.4%. The essential oil contains α-pinene and camphor.—Z. MANULKIN. *Acta Univ. Asiae Med.*, No. 34 (1939), 45–48; through *J. Soc. Chem. Ind.*, 59 (1940), 494. (E. G. V.)

Essential Oil of Lippia Adoensis Hochst.—Study of an. A fairly thick, straw colored, bitter oil with a strong odor of camphor and cineol recalling that of oil of rosemary, obtained by steam distillation of flowers of *Lippia adoensis* grown at Cissécondé near Ziguinchor (Senegal) gave the following results on analysis: refractive index at 20° C. 1.4765, specific gravity at 15° C. 0.9325, optical rotation at 15° C. −35° 10′, acid value 0.40, ester value 12.6, combined alcohol (as borneol) 3.5%, free alcohol (as borneol) by acetylation in pyridine 20.5%, camphor (by hot oximation in presence of calcium carbonate) 29.2%, ester value (after cold formylation) 110, sulfur none, nitrogen none, soluble in 1 vol. of 80% alcohol with turbidity on further addition of alcohol, soluble in 12 vol. of 70% alcohol; slight brownish coloration with ferric chloride (trace of phenols), brownish-yellow coloration with antimony trichloride (presence of double bonds), blue coloration with bromine in chloroform or acetic acid solution. The chief constituents were found to be: *l*-α-pinene, *l*-camphene, cineol, *l*-borneol (free and combined), *l*-camphor, acetic acid (combined), azulenogenic sesquiterpenes. The oil presents remarkable analogy with oil of rosemary as regards composition and odor, and would appear to be suitable as a substitute for the latter. The oil, however, differs from that of rosemary in that it is levo- instead of dextro-rotatory. It would seem to be the best source of *l*-camphor and *l*-borneol.—LÉON PALFRAY, SÉBASTIEN SABETAY and PIERRE PETIT. *Chimie & Industrie*, 43 (1940), 367–370. (A. P.-C.)

Essential Oil Standards for Non-medicinal Uses. A report was presented on the preparation of a book of standards for essential oils in relation to uses other than medicinal.—ANON. *Perfumer. Essent. Oil Record*, 32 (1941), 37. (A. C. DeD.)

Essential Oils of the Belgian Congo. I. Geranium Oil. Examination of samples of the oil produced in the Belgian Congo during 1937 and 1938 shows that the citronellol content is greatly influenced by the season, being 35–37% during the rainy and 42–45% during the dry months. The oil obtained from Ituri has greater density and refractive index than that obtained from Kivu. The hydrolyzed oil contains terpenes (0.5), methylheptenone (0.6), linalool (84), menthone and isomenthone (6.5), $CH_2.Ph.CH_2.OH$, non-identified laevorotatory sesquiterpenes and traces of other unidentified components (3), citronellol (44.5), geraniol (20) and sesquiterpenes (16.5%).—G. GOETHALS. *Bull. acad. roy. méd. Belg.*, 25 (1939), 91–108; through *J. Soc. Chem. Ind.*, 59 (1940), 640. (E. G. V.)

Litsea Cubeba Pers.—Essential Oils from. Oils distilled from the leaves of *L. cubeba*, growing in the mountain garden of Tjibadas ("litsea oil"), had d_{15}^{15} 0.885, 0.873; α_D −2°40′, 4°12′; n^{20} 1.4588; acid value 1.4, 7.2; ester value 39.5, 34; aldehydes ($C_{10}H_{18}O$) 34, 47.7; cineole 22.2, less than ten; and a lemon-like odor, whereas two samples of "krangean oil" (distilled in Java from *L. cubeba*) had d_{15}^{15} 0.933, 0.908; α_D −9°, −3°54′; n^{20} 1.4666, 1.4639; acid value 0.75; ester value 21.9, 15.8; aldehydes 9.2, 2.6; cineole 66.6, 66; and a cajaput-like odor. The litsea oil contained citral 5–7, citronellal 29–40, cineole 10–22, linalool 40–50 (9–11% as acetate), and terpenes 8%, while the krangean oil contained citral and citonellal 3–9, linalool and terpineol 7 (4% as acetate), terpenes 13%.—C. J. VAN HULSSEN and D. R. KOOLHASS. *Rec. trav. chim.*, 59 (1940), 105–110; through *J. Soc. Chem. Ind.*, 59 (1940), 403. (E. G. V.)

Massoi Bark—Essential Oil of. There is confusion in the literature between lawang oil, which contains eugenol, and massoi-bark oil (I) (physical constants given), which does not. I affords massoi-lactone, probably the lactone of δ-hydroxy-Δ^a deconoic acid, hydrogenated (Adams platinum oxide in acetic acid) to a hydrogen-derivative (II), probably the lactone of δ-hydroxy-decoic acid, which is oxidized by potassium dichromate-sulfuric acid to valeric, hexoic (III), succinic (IV), glutaric and probably δ-ketodecoic acid (V), melting point 53–54° (semicarbazone, melting point 110°). II and alkaline potassium permanganate of potassium dichromate-sulfuric acid give III + an acid, boiling point 110°/0.02 mm., or III + fumaric acid, respectively.—T. M. MEIJER. *Rec. trav. chim.*, 59 (1940), 191–201; through *J. Soc. Chem. Ind.*, 59 (1940), 403. (E. G. V.)

Parangos Pabularia Lindl. The fresh plant contains 2% of essential oil, consisting of myrcene 48, α-pinene 4, camphene traces, borneol and dihydrocuminol (free and as acetates) 17.5, an unidentified aldehyde trace, and resinous residues 28%. *P. fergansensis* yields 0.1% of oil containing myrcene 30, α-pinene 7.8, borneol and other alcohols 21.5%.—L. GRATSCH. *Acta Univ. Asiae Med.*, No. 34 (1939), 13–20; through *J. Soc. Chem. Ind.*, 59 (1940), 494. (E. G. V.)

Queensland Flora XVII—Essential Oils from. Oil of Evodia Littoralis and Occurrence of a New Phenolic Ketone. Leaves of *E. littoralis* (180 lb.) yielded on steam distillation an oil (182 cc.) having $d^{15.5}$ 0.8487, $(\alpha)_D$ + 16.5°, n_D^{20} 1.4860, ester value 0, acetyl value 36. The oil contained ocimene, *d*-α-pinene, unidentified sesquiterpenes and a sesquiterpene alcohol, and a phenolic ketone, evodionol, $C_{11}H_{15}O_3.OMe$, melting point 84° (2:4-dinitrophenylhydrazone, melting point 217°; acetyl derivative, melting point 66°; methyl ether, melting point 78°; 2:4-dinitrophenylhydrazone, melting point 157°).—F. N. LAHEY and T. G. H. JONES. *Univ. Queensland Papers*, 1 (1939), No. 13, 4 pp.; through *J. Soc. Chem. Ind.*, 59 (1940), 494. (E. G. V.)

Glycosides, Ferments and Carbohydrates

Artificial Honey—Detection of. Fiehe's test for artificial invert sugar fails in many cases and should not be used as the sole test for artificial honey. The sulfate ion may be present in natural honey, so that its presence is no sure criterion of the artificial product. It is suggested that addition of 10% of starch syrup or 0.2–0.5% of potato starch, the dextrin in which would be detected by the alcohol test, should be obligatory.—J. GROSSFIELD. *Z. Untersuch. Lebensm.*, 78 (1939), 380–385; through *J. Soc. Chem. Ind.*, 59 (1940), 635. (E. G. V.)

Carboxylase. The purification and properties of carboxylase are described. At the highest purity level reached, the enzyme contains 0.46% diphosphothiamine and 0.13% magnesium. The enzyme does not dissociate at p_H 6 but dissociates above p_H 8. Details are given of a method for the reversible resolution of carboxylase. The recombination

of the three components to form the original catalytically active enzyme is complex and the factors which affect the combination have been studied in some detail.—D. E. GREEN, D. HERBERT and V. SUBRAHMANYAN. *J. Biol. Chem.*, 138 (1941), 327. (F. J. S.)

Floridzine—Review of the Data on. Von Mering discovered in 1886 a substance fluoridzine which produces glycosuria without increasing the apparent glucemia. Floridzine is a glucoside extracted from the bark of roots of apple, cherry and plum trees. It has white needle crystals soluble in alcohol or hot water and decomposes in dilute mineral acids to glucose and floretine. For injecting it is dissolved in $^2/_3$ the desired volume of soda bicarbonate, heated two minutes to dissolve and made to volume with distilled water; more heat might transform the bicarbonate to carbonate making the solution too alkaline.—CARMELO FAZIO. *Rev. Col. Bioq. Farm., Cordoba*, 1 (1939), 64. (G. S. G.)

Honey—Vitamin C Content of. Animal feeding tests establish that there is no vitamin C in honey.—E. BECKER and R. F. KARDOS. *Z. Untersuch. Lebensm.*, 78 (1939), 305–308; through *J. Soc. Chem. Ind.*, 59 (1940), 638. (E. G. V.)

Honeys Containing Vitamin C. The strongly reducing constituent of thyme and mint honey is identified as ascorbic acid (I) by isolation of the 2:4-dinitrophenylhydrazone. Buckwheat honey also contains small amounts of I. The iodometric titration of I is modified since the usual method gives too high results.—C. GRIEBEL and G. HESS. *Z. Untersuch. Lebensm.*, 78 (1939), 308–314; through *J. Soc. Chem. Ind.*, 59 (1940), 638. (E. G. V.)

***d*-Mannose Obtained from Ivory-Nut Shavings by an Improved Method.** Numerous investigators have given directions for the preparation of *d*-mannose from ivory-nut turnings, a by-product in button factories. By using a mixture of methyl alcohol and isopropyl alcohol as a crystallizing mixture, the present author has improved the method and obtained a 35% yield based on the weight of ivory-nut shavings.—HORACE S. ISBELL. *J. Research Natl. Bur. Standards*, 26 (1941), 47–48. (W. T. S.)

Papain—Catalytic Effect of Active Crystalline, on the Denaturation of Thyroglobulin. Ultracentrifugal, kinetic and electrophoretic experiments show that active papain catalyzes the denaturation of thyroglobulin prior to hydrolytic fission of the protein. Inactive native or denatured papain does not possess this activity. An initial non-enzymatic conditioning reaction occurs before the enzymatic reaction. This involves a structural change in the native protein which presumably liberates groups to serve as points of attack for the enzyme. The results are in agreement with the Linderström-Lang theory for the mechanism of enzyme action in protein systems.—HAROLD P. LUNDGREN. *J. Biol. Chem.*, 138 (1941), 293. (F. J. S.)

Pentoses—Quantitative Determination of. A convenient procedure is proposed for determining the furfural produced by the action of acids on pentoses and other substances. When a furfural-forming substance is refluxed with aqueous acid of the proper concentration in the presence of a suitable high-boiling, immiscible solvent, the furfural, as it is formed, is rapidly extracted by the solvent and to a considerable extent protected from further decomposition by the acid. This fact has made it possible to eliminate the continuous-distillation or steam-distillation procedure which is the time-consuming feature of most pentose determinations. When the refluxing is done it is necessary only to determine the concentration of furfural in the organic solvent in order to be in a position to calculate the total amount of furfural which has been formed. One hundred per cent conversion of *d*-xylose into furfural has been achieved under a variety of conditions.—R. E. REEVES and J. MUNRO. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 551–553. (E. G. V.)

Saponins—Definition of. The term "saponin" was first used by Gmelin in 1819. Various definitions of the class of saponins are criticized in this paper and the following definition submitted on the basis of recent investigations on the chemical nature of saponins. Saponins are glycosides (or the corresponding uronic acid derivatives) whose aqueous solutions foam and whose aglycones belong to the class of polyterpenoids or cholanes. An easy means of determining to which of the two classes the aglycones belong is the following: when a solution of the compound in a little alcohol is treated with sulfuric acid containing vanillin, a lilac color slowly develops at room temperature, rapidly on heating; while sarsapogenin belonging to the cholane group gives no color. If the latter is treated with concentrated sulfuric acid first and then with vanillin-sulfuric acid reagent a lilac color develops. The generalness of this test should be checked.—L. ROSENTHALER. *Pharm. Acta Helv.*, 14 (1939), 221–223. (M. F. W. D.)

Starch Products—Simplified Alkali-Lability Determination for. A simplified alkalimetric method has been devised to estimate the relative hydrolytic degradation of starch products, analogous to the concept of alkali-lability.—T. J. SCHOCH and C. C. JENSEN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 531–532. (E. G. V.)

Sugars and Polyhydric Alcohols—Microscopic Identification of. Optical properties of gentiobiose, *d*-lyxose, trehalose, dulcitol, mannitol and sorbitol are given. Photomicrographs for these compounds and twelve mixtures of various sugars when precipitated from saturated aqueous solutions by acetone, alcohol, acetonitrile or 1,4-dioxane are depicted.—J. A. QUENSE and W. M. DEHN. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 556–560. (E. G. V.)

Syrups, Honey and the Like—Treatment of Invert. Fructose (I) is extracted from invert syrup, etc., by adding ethyl alcohol until it forms 85–87% of the total solvent (ethyl alcohol + water), and total solids are about 40% of the total solvent. The ingredients are mixed and kept at 21–26° until equilibrium is established, *i. e.*, total solids [comprising 88–91% of I] in the liquid phase are constant (determined by refractometer). The liquid phase is withdrawn and residual liquid is centrifuged off from the solid phase. The combined liquid phase is distilled to recover ethyl alcohol. The solid by-product is glucose (II), which is dried in a vacuum and ethyl alcohol recovered. Noncrystallizable honey is produced by adding a solvent, comprising 85% of ethyl alcohol and 10% of methyl alcohol (with 5% of water), until the alcohol is 65% and the total solids are 95% of the total solvent, and treating the mixture as above. The final product will contain 67% of I and 32% of II. With maple syrup the alcohol mixture is added to form 75% and the total solids 143% of the total solvent. The mixture is stored at 25° and then separated as above. The maple-flavor concentrate contains 75% of I. Other proportions of the alcohols may be used to vary the products obtained.—R. S. ANTHONY. U. S. pat. 2,094,053; through *J. Soc. Chem. Ind.*, 59 (1940), 635–636. (E. G. V.)

Other Plant Principles

Carotene—Determination of, in Plant Materials. A method for the determination of carotene in plant materials consists essentially of extraction with al-

cohol, extraction of the alcoholic extract with petroleum ether, removal of the alcohol from the petroleum ether and passing the extract through a Tswett column of dicalcium phosphate. By this method certain noncarotene chromogens are removed, so that the value obtained is probably for pure carotene. The results indicate that the Willstatter-Stroll method or its modifactions for the determination of carotene are not accurate for plant material which has been subjected to storage or to the action of the digestive tract.—L. A. MOORE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940). 726–729. (E. G. V.)

Chlorogenic Acid—Isolation of, from Valerian. The chromatographic study of six tinctures of valerian revealed the presence of a very tenacious yellow zone which exhibited a strong yellow fluorescence in ultraviolet light in four of the chromatograms. This indicated that some substance was not a constantly occurring component of all valerian preparations. The yellow zones cut out of the chromatograms were treated with 1% HCl and then extracted with glacial acetic acid. Crystallization from ether yields a crude product melting 150°. The compound was very soluble in water and gave a strong acid reaction. It was very easily soluble in methanol, soluble in glacial acetic acid and very difficultly soluble in ether. It formed an intense yellow solution in alkali and reduced silver solutions on warming but did not reduce Fehling's solution even after boiling with dilute hydrochloric acid. It produced a green color with ferric chloride which became red-brown after the addition of soda. Lead acetate gave an insoluble yellow lead salt. The compound was so strongly adsorbed on aluminum oxide that it was possible to obtain only a few milligrams on elutriation with hydrochloric acid. To avoid this, the tincture of valerian was diluted with water and then freed of alcohol *in vacuo*. The aqueous suspension was then extracted with ether. The ether extract removed only a trace of the compound. The aqueous solution was then treated with lead acetate and the precipitate centrifuged out. The lead salt was suspended in water and freed of lead by passing in hydrogen sulfide. The lead sulfide retained a trace of the compound by adsorption. The aqueous filtrate after the removal of the lead sulfide was evaporated *in vacuo* and there was obtained by repeated crystallization a small amount of material having the same properties as the crude material and melting 219–221° (cor.). When the compound was treated with diazomethane and the ether ester saponified, the product could be converted to veratric acid by permanganate oxidation. A sample of the compound was hydrolyzed yielding caffeic acid and quinic acid. The caffeic acid was identified by conversion to the diacetoxy derivative with acetic anhydride and comparison with a sample obtained from another source. Authentic chlorogenic acid was liberated from potassium chlorogenate-caffeine and when mixed with the sample isolated from valerian gave no depression of melting point. The acetylation of an authentic sample of chlorogenic acid with acetic anhydride and sulfuric acid gave a derivative which gave no melting point depression with a similar derivative prepared from the acid isolated from valerian.—MARGUERITE FICHTER. *Pharm. Acta Helv.*, 14 (1939), 163–170. (M. F. W. D.)

Fenchone—Preparation of, from Fennel Oil Residues. The residue after freezing out of anethole is fractionally distilled and the fraction of boiling point 180–210° is heated with concentrated nitric acid (3–4 hours at the boiling point) and then poured into water. The supernatant layer is washed with aqueous sodium hydroxide and steam distilled, to give pure fenchone in 10–12% yield.—A. I. SCHAVRIGIN. *J. Applied Chem. Russ.*, 12 (1939), 1201–1203; through *J. Soc. Chem. Ind.*, 59 (1940), 494. (E. G. V.)

Gossypol—Determination of, in Crude Cottonseed Oil. A mixture of pyridine and aniline is more effective than aniline in precipitating gossypol from crude cottonseed oil. A modification of the pyridine-aniline method, which recovers up to 98% of gossypol from 0.2% solution in oil, is described. The pyridine-aniline reagent precipitates dianilinogossypol containing 2 molecules of pyridine of crytallization. The pyridine is removed quantitatively, without decomposition of the residual dianilinogossypol, by heating the precipitate 1 hour at 160° C. The dianilinogossypol-dipyridine complex is fairly stable at 60° C., and after heating for 2 hours at this temperature, its composition corresponds closely to the formula, $C_{42}H_{40}N_2O_6.2C_5H_5N$. The addition of a small amount of pyridine to the petroleum ether used for washing the dianilinogossypol precipitate decreases the solubility of the precipitate, and gives higher recovery of gossypol from dilute oil solutions. Pyridine alone will not precipitate gossypol from crude cottonseed oil. The solubility of gossypol in pyridine was found to be 13.3% by weight at 25° C. A pyridine-gossypol complex having the formula $2C_{30}H_{30}O_8{\cdot}5C_5H_5N$ is described. —H. D. ROYCE, J. R. HARRISON and P. D. DEAMS. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 741–744. (E. G. V.)

Paprika—Determination of Pigment Components of. The carotene, crypto- and zea-xanthine, capsanthin and capsorubin contents of a number of samples of pericarp and other preparations of paprika, determined chromatographically, are tabulated. The loss of pigment during storage for 12 months is inappreciable.—L. VON CHOLNOKY. *Z. Untersuch Lebensm.*, 78 (1939), 157–161; through *J. Soc. Chem. Ind.*, 59 (1940), 485. (E. G. V.)

Terpineol—Manufacture of, from Terpin Hydrate. In the dehydration of terpin hydrate, *e. g.*, by 0.3–0.5% of sulfuric acid at not greater than 100°, distillation of terpineol in steam is avoided by effecting dehydration in presence of an organic solvent immiscible with water (*e. g.*, benzene), cooling to less than 49° and distilling the solution directly.—W. C. MEULY. U. S. pat. 2,088,030; through *J. Soc. Chem. Ind.*, 59 (1940), 594. (E. G. V.)

Fixed Oils, Fats and Waxes

Fat Acids of Blood—New Micromethod for the Determination of, after Oxidation with Potassium Iodate and Concentrated Sulfuric Acid. The method consists in extracting the total lipoids from blood with a mixture of alcohol and ether. After saponification and extraction of the residue with acid and petroleum ether, the solution is evaporated to dryness and this residue is heated in a closed tube with concentrated sulfuric acid and potassium iodate in the presence of sodium tungstate at 200° C. After 30 minutes the tube is cooled and opened. The contents of the tube are then diluted with water, the liberated iodine is distilled into potassium iodide solution and the distillate is titrated with sodium thiosulfate. The iodine liberated is formed from cholesterol and fat acids and the value of the latter is obtained by deducting the cholesterol as determined separately. The method was checked by adding known quantities of oleic acid to plasma.—I. CLAUDATUS and A. GHEORGHIU. *Mikrochemie (Mikrochimie Acta)*, 26 (1939), 311–313; through *Chimie & Industrie*, 42 (1939), 964. (A. P.-C.)

Fats and Fat Materials—Role of, in Pharmaceutical and Cosmetic Preparations. A lecture.—L. D. EDWARDS. *Oil and Soap*, 17 (1940), 82–84; through *J. Soc. Chem. Ind.*, 59 (1940), 544. (E. G. V.)

Fats and Fat Products—Italian Methods of Analysis for. A brief summary is given of the methods for sampling and analysis of oil seeds, soap stock, distillation residues, bleaching earths, oils and fats, soaps, glycerin and sulfonated oils.—G. B. MARTINENGHI. *Fette u. Seifen*, 46 (1939), 529–531; through *J. Soc. Chem. Ind.*, 59 (1940), 372. (E. G. V.)

Fats—Effect of Carotene, Ascorbic Acid and Oxygen on the Hydrolysis and Synthesis of, by Lipase. Carotene inhibits, whereas ascorbic acid stimulates, fat hydrolysis by lipase. No effect on the synthesis of fat was observed with ascorbic acid or carotene.—E. E. MARTINSON and I. V. FETISSENKO. *Biokhimia* 3 (1939) 784–791; through *Chimie & Industrie*, 43 (1940) 52. (A. P.-C.)

Fatty Acids and Triglycerides—Mean Molecular Weights of. The formula for calculation of mean molecular weights of constituent fatty acids in a fixed oil or fat gives results correct to less than 1% only when the free fatty acids (I) and unsaponifiable matter (II) are not greater than 1%. In order to get results correct to within 0.1% for all concentrations of I and II a corrected ester value must be used: $E/[1-0.01(a+u)]$, where E is the ester valance of the oil containing a% of I and u% of II. The molecular weight so obtained may then be used to recalculate the acid value.—F. HAWKE. *J. S. Chem. Inst.*, 23 (1940), 21–24; through *J. Soc. Chem. Ind.*, 59 (1940), 372. (E. G. V.)

Licuri (Cocos Coronata Mart.) Wax and Oil. Wax and oil from the leaves of *C. coronata*, from north and east Brazil, has d_4^{15} 1.010, melting point 84.5°, acid value 12.02, saponification value 109.2, ester value 97.18, iodine value (Hanus) 15.2. It is more soluble in organic solvents than is carnauba wax, which it otherwise resembles and for which it is a suitable substitute. Licuri oil from the nuts resembles coconut oil and babassu oil (I) and has d_4^{15} 0.92, n^{15} 1.4596, melting point 21°, freezing point 17.5°, acid value 4.7, saponification value 257.7 and ester value 253.0. It can be employed in soap manufacture and is more economical than I.—M. SILVA. *Rev. Chim. Ind.*, 9 (1940), 82–85; through *J. Soc. Chem. Ind.*, 59 (1940), 545. (E. G. V.)

Milk Fat—Component Glycerides of. The component glycerides of a typical milk fat have been studied by resolution of the fat into three fractions by crystallization from acetone, followed by detailed examination of each fraction. The number of component acids in butter fat has rendered impossible anything of the nature of an exact description of the many mixed glycerides undoubtedly present, but the general distribution of the four main groups of acids—oleic, palmitic, stearic and the lower acids of the C_4 to C_{14} series—has been approximately indicated.—T. P. HILDITCH, S. PAUL, *et al. J. Soc. Chem. Ind.*, 59 (1940), 138–144. (E. G. V.)

Mineral Oil—Detection of, in Almond Oil. Data indicating changes in density, refractive index, saponification value and iodine value due to addition of mineral oil I to almond oil are tabulated. I is detected by the turbidity test with 70% ethyl alcohol.—S. ANSELMI. *Olii min.*, 19 (1939), 103–108; through *J. Soc. Chem. Ind.*, 59 (1940), 463. (E. G. V.)

Olive Oil—Color Test for Differentiating Refined from Non-Refined Virgin Olive Oil. The non-refined olive oil is stipulated to have received no chemical treatment apart from washing with water, and to have an acidity less than 1.2% (as oleic acid). The treatment of oils of greater acidity by alkali is detected by testing the 90%-ethyl alcohol extract with bromophenol-blue.—A. ROMEO. *Olii min.*, 19 (1939), 88–91; through *J. Soc. Chem. Ind.*, 59 (1940), 374. (E. G. V.)

Paraffin Wax, Ozokerite and Ceresin. The Russian standard specifications for these materials are critically reviewed.—L. IVANOVSZKY. *Oil Colour Trades J.*, 97 (1940), 241–243, 297–299, 352–354, 399–401; through *J. Soc. Chem. Ind.*, 59 (1940), 339. (E. G. V.)

Sesame Oil (Hydrogenated) as a Rancidity Inhibitor. Partially hydrogenated sesame oil appears to have a definite inhibitory action to rancidity in lard when used in very large amounts. Smaller amounts reduce the extent of rancidity, but do not prevent it. As little as 20% retards rancidity; a mixture of 60% of hydrogenated sesame oil and 40% of lard did not develop rancidity in seven days whereas untreated lard became definitely rancid within that time. A mixture of 80% hydrogenated sesame oil and 20% of lard did not develop rancidity within 28 days. The unsaponifiable matter obtained from hydrogenated sesame oil did not possess rancidity-inhibiting properties.—G. W. FIERO. *Pharm. Arch.*, 11 (1940), 1. (A. C. DeD.)

Shea Butter—Unsaponifiable Constituents of. The ethyl alcohol solution portion contained lupeol, α- and β-amyrin, basseol and parkeol ($C_{30}H_{49}.OH$), melting point 164° (acetate, melting point 154°; benzoate, melting point 197°; digitonide, melting point 245° with decomposition).—K. H. BAUER and H. MOLL. *Fette u. Seifen*, 46 (1939), 560–563; through *J. Soc. Chem. Ind.*, 59 (1940), 372. (E. G. V.)

Waxes and Mixtures on a Wax Basis—Analysis of. The systematic analysis of a mixture, involving separation and examination of unsaponifiable matter, fatty acids and detection of rosin, is described.—E. DELVAUX. *Fette u. Seifen*, 46 (1939), 726–728; through *J. Soc. Chem. Ind.*, 59 (1940), 375. (E. G. V.)

Unclassified

Alkyl Thiocyanate—Preparation of. Previously the authors had found that cinnamyl bromide in alcoholic solution on heating with sodium thiocyanate yields cinnamyl isothiocyanate instead of the expected isomer. Cinnamyl thiocyanate is obtained by exchange of cinnamyl bromide with KSCN in the cold and is converted to the isomeric cinnamyl mustard oil by heating. Heating this with cinnamyl bromide in diluted alcohol gives the cinnamyl ester of cinnamyl-thiocarbamic acid, m. p. 111–120° C.—VON T. WAGNER-JAUREGG, H. ARNOLD and H. HIPPCHEN. *J. prakt. Chem.*, 156 (1940), 260. (W. T. S.)

Amino Acids—Condensation of, with Terpenes. I. Aminoacetic Acid and Limonene Nitrosochloride. Report is made of some introductory work on a research project in which it is planned to prepare condensation products of amino acids and terpenes and to study the biological properties. The reaction between aminoacetic acid and limonene nitrosochloride has been studied and the reaction is explained by equations.—C. F. KREWSON. *Jour. A. Ph. A.*, 30 (1941), 47. (Z. M. C.)

Analgesics—Experiments Toward the Synthesis of. The syntheses of 1-(2′-furyl)-3:4-dihydro-6:7-methylenedioxyisoquinoline, 1 - (7′ - methoxy-2′ - coumaronyl) - 3:4 - dihydro - 6:7 - methylenedioxyisoquinoline and 1-(9′-phenanthryl)-3:4-dihydro - 6:7 - methylenedioxyisoquinoline and their *N*-methyltetrahydro derivatives are reported.—P. V. A. RAMAN. *J. Indian Chem. Soc.*, 17 (1940), 715. (F. J. S.)

Ascorbic Acid. In place of diacetone-2-keto-*l*-gulonic acid, other methylene ether derivatives of 2-keto-*l*-gulonic acid are treated with concentrated hydrochloric acid and the resulting ascorbic acid is separated from the reaction mixture.—OTTO ZIMA, assignor to MERCK & CO. U. S. pat. 2,190,167, Feb. 13, 1940. (A. P.-C.)

l-Ascorbic Acid. Diacetone-2-keto-*l*-gulonic acid is treated with concentrated hydrochloric, preferably at 60° to 80° C. The process may be effected in a sealed vessel, or the hydrochloric acid lost by evaporation may be replaced by passing hydrochloric acid gas into the mixture.—OTTO ZIMA, assignor to MERCK & Co. U. S. pat. 2,189,830, Feb. 13, 1940. (A. P.-C.)

Barbituric Acid Derivatives. Details are given of the production of various secondary 5-1-alkenyl derivatives of barbituric acid in which the alkenyl group is an open chain group, these derivatives having hypnotic and anesthetic properties and are of relatively low toxicity; and general mention is made of the production of a number of others.—ARTHUR C. COPE, assignor to SHARP & DOHME, INC. U. S. pats. 2,187,901 to 2,187,903, Jan. 16, 1940. WALTER H. HARTUNG and FRANK S. CROSSLEY, assignors to SHARP & DOHME, INC. U. S. pat. 2,187,905, Jan. 16, 1940. (A. P.-C.)

Barbituric Acids—Methods of Preparation Some N- and N,C-Substituted. A study of the best conditions for the condensation reaction between phenylurea or acetylmethylurea and malonic, ethylmalonic and diallylmalonic esters. The following substituted barbituric acids were prepared: 1-phenylbarbituric, 1-methylbarbituric, 1-phenyl-5-ethylbarbituric, 1-methyl-5-ethylbarbituric, 1-phenyl-5,5-diallylbarbituric, 1-methyl-5,5-dialylbarbituric. Condensation was effected in presence of sodium ethylate. The 5,5-disubstituted and the 5,5,1-trisubstituted acids are very sensitive to the action of alkalies and give the corresponding malonuric acids. In all cases the condensation with phenylurea proceeds much more rapidly than with acetylmethylurea. The yields obtained in the preparation of substituted barbituric acids are of the order of 75%.—H. ASPELUND and L. LINDH. *Acta Acad. Aboensis Math. et Phys.*, 11 (1939), 1–15; through *Chimie & Industrie*, 43 (1940), 843. (A. P.-C.)

ωω′-Bis-2′-amino-4′-thiazolylalkanes and N⁴′-2′-Thiazolylsulfanilamides—Synthesis of. To further develop the chemotherapy of trypanosomiasis, a series of ωω′-bis-2′-amino-4′-thiazolylalkanes were prepared as the dihydrochloride by reacting the corresponding acetylalkanes with thiourea. The free bases of the compounds were obtained by treating their hot aqueous solutions with an excess of $NaHCO_3$. The Arndt-Eistert method for the homologation of carboxylic acids was found applicable to sebacic acid (yield 72% decane-1:10-dicarboxylic acid) and to adipic acid (yield 75% of suberic acid). In another connection, the synthesis of two N-2′-thiazolylsulfanilamides containing the thiazole moiety, characteristic of vitamin B_1, was undertaken in the anticipation that these might be of interest in infections requiring vitamin B_1 as the growth factor. Sulfanilamide and NH_4SCN were reacted to give 4-sulfonamidophenylthiourea and this substance treated with the appropriate α-halogeno-ketones.—JAMES WALKER. *J. Chem. Soc.*, (1940), 1304–1307. (W. T. S.)

Bromo Compounds—Radioactive Organic. A few radioactive bromo compounds have been prepared and the yield of the radioactive materials in the compounds determined.—S. D. CHATTERJEE and D. K. BANERJEE. *J. Indian Chem. Soc.*, 17 (1940), 712. (F. J. S.)

Carcinogenic Hydrocarbons—Attempted Syntheses of. 9:10-Dimethyl-9:10-dihydro-1:2-benzanthraquinol and 9:10-dimethyl-9:10-dihydro-1:2:-5:6-dibenzanthraquinol have been dehydrated to endo-oxides which are easily reduced to the completely aromatic hydrocarbons. This reaction furnishes an alternative route to the highly carcinogenic 9:10-dimethyl-1:2-benzanthracene. Unsuccessful attempts have been made to transform 1:2:9:10 - tetramethyl - 9:10 - dihydroanthraquinol into 1:2:9:10 - tetramethylanthracene.—G. M. BADGER, F. GOULDEN and F. LL. WARREN. *J. Chem. Soc.*, (1941), 18–20. (W. T. S.)

Gold Compounds of Albuminose-Like Keratin Degradation Products Containing Sulfhydryl Groups. Water-soluble gold compounds of albuminose keratin degradation products containing sulfhydryl groups are prepared by subjecting keratin substances such as hari to a long acid hydrolysis until the keratin goes into solution, reducing, neutralizing the excess of acid and removing the reducing agent. The hydrolysate is treated with a gold compound before evaporation, the solution is made weakly alkaline by alkali metal oxide, hydroxide or carbonate, and the resulting complex gold compound precipitated by adding solvent miscible with water. Examples are given. The compounds are used in therapy.—ADOLF FELDT and KARL SCHÖLKOPF, assignors to SCHERING A.-G. U. S. pat. 2,186,694, Jan. 9, 1940. (A. P.-C.)

Hydroquinine—Synthesis of Isomers of. I. Isomers of hydroquininone and of hydroquinine having a quinuclidic nucleus in 8-position were synthesized. Catalytic hydrogenation of isohydroquininone in presence of palladium black breaks the quinuclidic ring with formation of isohydroquinotoxinol; on the other hand, the use of aluminum isopropylate leads to normal reduction of the ketone into alcohol with formation of a mixture of stereoisomers of isohydroquinine. The chemotherapeutic study of these compounds showed that by transferring the ethylquinuclidylcarbinol group from position-4 to position-8, the antimalarial action is destroyed without affecting the anesthetizing activity.—M. V. ROUBTSOV. *J. Obchtch. Khim.*, 9 (1939), 1493–1506; through *Chimie & Industrie*, 43 (1940), 589. (A. P.-C.)

4-Methylcholanthrene and 5-Methylcholanthrene as Possible Carcinogens. The preparation of isomeric methylcholanthrenes is of interest due to the known potent carcinogenic activity of 3-methylcholanthrene. 5-Keto-7-methyl-5,6,7,8-tetrahydro-1,2-benzanthracene was reduced to the corresponding secondary alcohol which was then converted to the chloride with hydrogen chloride. The chloride was converted by a malonic acid synthesis to 7-methyl - 5,6,7,8 - tetrahydro - 1,2-benzanthracene-5-acetic acid. Cyclization of this acid yielded 1-keto - 4 - methyl - tetrahydrocholanthrene. Reduction of this by the Clemmensen method gave 4 - methyltetrahydrocholanthrene which was dehydrogenated to the desired 4-methylcholanthrene. In a similar manner 5-methylcholanthrene was prepared from 5-keto-8-methyl-5,6,7,8-tetra-1,2-benzanthracene.—W. E. BACHMANN and J. M. CHEMERDA. *J. Org. Chem.*, 6 (1941), 50–53. (W. T. S.)

***n*-Pentadecylic Acid—Synthesis of.** *n*-Pentadecylic acid has been synthesized starting with both commercial myristic acid and with tetradecyl alcohol. Procedures have been tried coming through tetradecyl bromide and tetradecyl iodide as intermediaries. The results obtained indicate that the iodide procedure is far less time consuming and gives substantially better yields. A general idea of the overall production may be gained from the figures: 220 Gm. of highly purified tetradecyl alcohol yielded 153 Gm. of highly purified pentadecylic acid by way of the iodide to the nitrile to the acid. This is a percentage turnover of 69.6 on the basis of the original amount of pure tetradecyl alcohol used; not based on theoretical yields. In terms of tripentadecylin turnover from tetradecyl alcohol, the figure is 63.5%; that is, if one started with 100 Gm. of tetradecyl alcohol of good quality by this procedure approximately 63.5 Gm. of tripenta-

decylin might be expected.—C. F. KREWSON. *Pharm. Arch.*, 11 (1940), 12. (A. C. DeD.)

Polycyclic Aromatic Hydrocarbons. 1:2:3:4-Tetramethylphenanthrene, a compound constituting a link between the carcinogenic derivatives of 1:2 - benzphenanthrene, 3:4 - benzphenanthrene and chrysene, has been prepared from 1:2:3:4-tetramethylphenylacetic acid by the Pschorr reaction. The results of its biological examination will be published elsewhere.—C. L. HEWETT and RICHARD H. MARTIN. *J. Chem. Soc.*, (1940), 1396–1398. (W. T. S.)

Polyhydrocyclopentanophenanthrene Series—Carboxylic Acid Amides of the. Intermediates for the manufacture of therapeutic compounds, which may have the reactivity of corpus luteum hormone or of the hormone of the suprarenal cortex, which are polyhydrocyclopentanophenanthrene carboxylic acid amides or the free acids are obtained by a process involving treating a free or esterified α-hydroxy nitrile of the polyhydrocyclopentanophenanthrene series with an acid and if desired subsequently with an alkaline reagent. Details are given of the production of some of these compounds.—KARL MIESCHER and ALBERT WETTSTEIN, assignors to SOCIÉTÉ POUR L'INDUSTRIE CHIMIQUE À BÂLE. U. S. pat. 2,191,394, Feb. 20, 1940. (A. P.-C.)

Pyrimidine Compounds—New. Secondary amines are made to react on dihalogeno-2,4-pyrimidines. The products are particularly useful as vermin destroyers.—I. G. FARBENINDUSTRIE A.-G. Belg. pat. 436,147, Sept. 30, 1939. (A. P.-C.)

Sesquiterpene Series—Studies in the. I. Synthesis of the Triethyl Ester of $C_9H_{16}(CO_2H)_3$ Obtained from Selinenes. A synthetic route has been developed for the synthesis of the tricarboxylic acid which has been obtained by the oxidation of selinenes. This method offers the possibilities for the extention of the same for the synthesis of the naturally occurring selinenes and related compounds. One of the salient points of the scheme is the introduction of the carboxyl group at the required position in the cyclohexane ring through the condensation of oxalic ester according to the "Principle of Vinylogy."—PHANINDRA CHANDRA DUTTA. *J. Indian Chem. Soc.*, 17 (1940), 649. (F. J. S.)

Sulfanilamide—Condensation of, with Halogeno-pyridines, -quinolines and -isoquinolines. When a series halogeno-pyridines, -quinolines and -isoquinolines were condensed with sulfanilamide in the presence of K_2CO_3 and Cu, the condensations generally occurred at the sulfonamide end of the molecule. However, 2-chloro-5-nitropyridine gave a mixture of 5 - nitro - 2 - (*p* - aminobenzenesulfonamido)pyridine and *p* - (5′ - nitro - 2′ - pyridylamino)benzenesulfonamide, the former predominating. Without the alkali carbonate condensations between the same reactants occurred at the amino nitrogen.—MONTAGUE A. PHILLIPS. *J. Chem. Soc.*, (1941) 9–15. (W. T. S.)

Sulfanilamide Derivatives—Preparation of Some. A series of compounds of the type $X.NH.C_6H_4.SO_2.NY.CH_2Z$ (p) have been prepared in which X is H or acetyl, Y is H or alkyl and Z is CN, $CO.NH_2$ or CO_2R. These substances have been examined for useful therapeutic properties but so far the majority of them have proved of little value.—WESLEY COCKER. *J. Chem. Soc.*, (1940), 1574–1576. (W. T. S.)

α-Tocopherol—Higher Homolog of. 5,7-Dimethyl-8-ethyltocol, synthesized from 3,5-dimethyl-2-ethylphenol, is an oily liquid possessing vitamin E potency. In 16-mg. doses it exhibited full vitamin E activity in rat tests.—P. KARRER and O. HOFFMANN. *Helv. Chim. Acta*, 22 (1939), 654–657; through *Chimie & Industrie*, 42 (1939), 1032. (A. P.-C.)

***dl*-α-Tocopherol—Preparation of, from Synthetic Phytol.** *dl*-α-Tocopherol prepared from phytyl bromide synthesized from hexahydropseudoionone passing through hexahydrofarnesol, corresponds to tocopherol synthesized from natural phytol; yet its allophanate, even after 6 recrystallizations, has a melting point 4° C. below that of the allophanate of tocopherol prepared from natural phytol. Both tocopherols have the same physiological potency.—P. KARRER and B. H. RINGIER. *Helv. Chim. Acta*, 22 (1939), 610–616; through *Chimie & Industrie*, 42 (1939), 1032. (A. P.-C.)

Trimethyl-1,2-Benzanthracenes as Possible Carcinogenic Hydrocarbons. New methods have been developed and detailed experimental procedures have been described for the syntheses of 7-methyl-1,2 - benzanthracene (I), 8 - methyl - 1,2-benzanthracene (II) and certain other 1,2-benzanthracene derivatives. Considering the marked carcinogenic effect of 9,10-dimethyl-1,2-benzanthracene when applied to the skin of mice, additional derivatives of this hydrocarbon have been prepared for biological testing. Compounds I and II were oxidized to the corresponding quinones. The quinone was treated with CH_3MgI to give the diol, which was methylated by CH_3OH containing a small quantity of H_2SO_4 and the resulting dimethylether converted to the meso dimethyl-1,2-benzanthracene by reaction with 2 equivalents of sodium.—W. E. BACHMANN and J. M. CHEMERDA. *J. Org. Chem.*, 6 (1941), 36–49. (W. T. S.)

BIOCHEMISTRY

Amino Acids—Maintenance of Nitrogen Equilibrium of, Administered Parenterally. A mixture of amino acids containing all the essential amino acids as been prepared which can be administered to normal and postoperative patients subcutaneously or intravenously without untoward reactions. Both subcutaneous and intravenous methods of injection were found to be efficient. The parenteral administration of amino acids mixture could be substituted for protein in the diet to maintain the patient in nitrogen balance. In postoperative cases where food intake is not possible, the amino acid mixture was almost completely utilized and aided toward maintaining a nitrogen equilibrium.—S. S. ALTSHULER, H. M. HENSEL and M. SAHYUN. *Am. J. Med. Sci.*, 200 (1940), 239–244. (B. H.)

Ammonium Molybdate—Biologic Reduction of, by Serratia Bacteria. The observations of the action of bacteria of the genus *Serratia* on ammonium molybdate in different media and under different conditions are reported and discussed.—A. JAN. *Bull. sci. pharmacol.*, 46 (1939), 336–339. (S. W. G.)

Aneurin—Phycomyces Test for the Determination of, in Urine. Dilute the urine with 2 volumes of distilled water slightly acidified with acetic acid so that the p_H remains at about 4; add 0.5 Gm. of fuller's earth per 10 cc. of urine and shake for 3 minutes; centrifuge after standing for 15 minutes; wash the adsorbate with acidified water (p_H 4) and with 95% alcohol and dry at 100° C. Weigh the powder, add normal sodium hydroxide, neutralize the liquid, and add it in increasing amounts to a synthetic nutritive medium; to each tube add 1 drop of an emulsion of fresh spores of *Phycomyces blakesleyanus*. The mold development is proportional to the aneurin content.—C. G. VILLELA. *Compt. rend. soc. biol.*, 129 (1938), 989–991; through *Chimie & Industrie*. 42 (1939), 32. (A. P.-C.)

Anticoagulants—Influence of, on the Proportions of Elements in the Blood. The effects of anticoagu-

lants on the various elements, sugar and proteins in the blood are described. Anticoagulants such as oxalate, citrate, fluoride, heparin and hirudin cause a diminution of protein and glucose in the blood plasma of the human subjects and different animals used. This diminution is not due to a precipitation of the proteins by the anticoagulants, but to the dilution of the plasma by the water from erythrocyates. It is the separation of hydrocarbonic acid from the blood which controls the passage of globular water into the medium at the moment of coagulation.—V. CHORINE. *Ann. inst. Pasteur*, 63 (1939) 213–256, 367–399; through *Chimie & Industrie*, 43 (1940), 288, 374. (A. P.-C.)

Antirachitic Products—Use of Ozone in Preparing. Sprayed milk or other food or food ingredient in which vitamin D potency is to be developed is subjected to the action of ozone as an antirachitic activating agent.—JAMES K. ELDERKIN and EMIL HOFMAN, assignor to CHEMICAL PRODUCTS CO. OF N. J. U. S. pat. 2,183,933, Dec. 19, 1939. (A. P.-C.)

Antirachitic Vitamins—Chemistry of. A review of the isolation of vitamins D_2 and D_3 and of the structure and synethesis of vitamins D_2, D_3, D_4 and D_5, based chiefly on the work of Windaus and his coworkers.—I. ARBOUZOV. *Ousp. Khimii*, 7 (1938), 1109–1143; through *Chimie & Industrie*, 42 (1939), 679. (A. P.-C.)

Arsine and Blood. The solubility of arsine in protein solutions is appreciably greater than in solutions of electrolytes. At 20° C. and in absence of oxygen, fresh blood dissolves 0.5% to 0.8% of the gas; this phenomenon is quantitative and reversible. In presence of oxygen there is formed elemental arsenic, methomoglobin and hydrogen peroxide, and also a second derivative of the blood pigment, pseudohemoglobin.—F. JUNG. *Naturwissenschaften*. 27 (1939), 318; through *Chimie & Industrie*, 42 (1939), 810. (A. P.-C.)

Ascorbic Acid—Course of Excretion of, in the Urine after Intake of Large Doses. By administering standardized tablets of ascorbic acid to individuals showing various degrees of vitamin C saturation and then using iodophenol to estimate that appearing in the urine, the authors have obtained these results with respect to the ingestion, absorption and elimination of this vitamin. After its intake in heavy doses, a high percentage of the total excess output of the vitamin in the day following the intake was given out in the first period of twelve hours as compared to the second period of twelve hours. This percentage rose with an increase in total excess output, *i. e.*, with higher saturation in the body. The excretion of the vitamin rarely becomes constant and never equal to that ingested even under complete saturation. The results are well tabulated. —N. M. BASU and G. K. RAY. *Indian J. Med. Research*, 27 (1940), 907–915. (W. T. S.)

Barbital and Its Derivatives—Quick and Easy Method for Detecting in Urine. Slightly acidify the urine, shake with charcoal, filter, dry the charcoal, extract with 95% alcohol acidified with 1 drop of 10% tartaric acid solution and filter; test the filtrate colorimetrically by the Parri reaction (addition of 2 drops of 10% cobalt nitrate and 2 drops of 10% ammonia) which gives a characteristic mauve coloration. The test will detect concentrations of 0.01% or more of barbital.—C. M. CATTABENI. *Diagnostica tec. lab.*, 10 (1939), 39–41; through *Chimie & Industrie*, 42 (1939), 451. (A. P.-C.)

Barbiturates—Simple and Rapid Qualitative Test for. The addition of 5 to 25 mg. of a soluble barbiturate to ten cubic centimeters of water in a clean test tube containing 0.04 cubic centimeter or one drop of mercurous nitrate test solution (U. S. P. XI) produces a white to gray colored gelatinous or flocculent precipitate, except for sodium barbital and pentothal sodium where the precipitate was of a finer type with less tendency for flocculation. The addition to the above of 0.08 cubic centimeters or two drops of potassium iodide test solution (U. S. P. XI) produced a greenish colored colloidal solution, with a change in the character of the precipitate to one with no visible particles. The addition of potassium iodide to a blank produced a canary yellow colored colloidal solution. Determinations on light transmission from 400 to 700 angstroms with a spectrophotelometer revealed specific differences in the control from those with a barbiturate present. The test is useful for quick differentiation of the barbiturates from other sedatives, particularly the opiates. Many of the drugs tested formed a precitate with mercurous nitrate, but on adding the potassium iodide either a visible precipitation occurred or the solution was yellow or some other color than green if colloidal. A number of the drugs gave no precipitate with mercurous nitrate. Theobromine and theophylline, were the only two drugs tested which gave similar results to the barbiturates and on a basis of chemical structure this was not surprising. The two drugs may be differentiated by modifications of the test.—HURLEY L. MOTLEY. *J. Pharmacol.*, 72 (1941), 30. (H. B. H.)

B Group of Vitamins—Pellagra Due to the Deficiency of. It is conservative to think of pellagra as a B group avitaminosis in which the lack of nicotinic acid is predominant but in which other vitamins are depleted to a level of physiologic inadequacy. The derivation of energy from carbohydrate foods and certain respiratory processes of cells depend on the chemical activity of compounds of the B group of vitamins with phosphoric and adenylic acids. The fundamental mechanism of vitamin deficiency is the effort of the body to derive energy from carbohydrates in excess of the available supply of vitamins. An adequate diet is the most important therapeutic measure in all avitaminoses. Sufficient amounts of protein, fat and minerals are essential to health. It is particularly important to refrain from treating presenting symptoms which are due to a single predominating avitaminosis with large amounts of the specific vitamin since this will precipitate the manifestations of coincident subclinical deficiencies of other members of the group.—V. P. SYDENSTRICKER. *Ann. Internal Med.*, 14 (1941), 1499; through *Abbott Abstract Service*, (1941), No. 866. (F. J. S.)

Bile Salts and Fatty Acids—Relation of, to Gallstone Formation. From animal experiments on bile it has been shown that the saponifiable fraction or the fatty acids in the bile play an extremely significant role in maintaining cholesterol in solution and in preventing the formation of gallstones. The studies further indicated that the action of fatty acids in this connection is much greater than the action of bile salts and the bile acids. Fatty acids occurring most frequently in bile are oleic, palmitic, stearic, myristic, lauric and linoleic acids. The conjugated bile salts by themselves exert only a small effect on the solubility of cholesterol. The unsaturated linoleic and oleic acids have more solvent action than the saturated stearic acid with the same length carbon chain. The bile salts are found to have a variable effect on the solubility of cholesterol when they are mixed with the fatty acid. There is a suggestion that the bile salts and the cholesterol may compete for solution in the fatty acid.—R. E. DOLKART, M. LORENZ, K. K. JONES and C. F. G. BROWN. *Arch. Internal. Med.*, 66 (1940), 1087; through *Abbott Abstract Service*, (1941), No. 826. (F. J. S.)

Blood Analysis—Leech Method of. A New Micro-Method. The leech method can be used for

determination of blood sugar and gives fairly reliable results. Leech can be safely aplied for any space of time from ten minutes to half an hour.—H. OHSAKO. *Tôhoku J. Exp. Med.*, 35 (1939), 153. (A. C. DeD.)

Blood Cholesterol—Microdetermination of. The method of estimating cholesterol is based on the fact that free cholesterol reacts with an alcoholic solution of digitonin forming an insoluble compound while the cholesterol esters are not precipitated. Several colorimetric methods have been developed but many require too large an amount of blood and too long a time for clinical purposes. A microdetermination requires 0.2 cc. of blood from a skin puncture. This is extracted with acetone, evaporated and extracted with chloroform. Two standards are set up containing cholesterol in chloroform and all are treated with acetic anhydride and sulfuric acid. A colorimetric comparison is made.—BERNARD BRAIER. *Anales farm. bioquím.* (*Buenos Aires*), *Suplemento*, 11 (1940), 8. (G. S. G.)

Blood—Clotting of Preserved. The authors on April 20th reported to the French Society of Biology the formation of clots in citrated preserved human blood. Examination of samples of blood of various ages showed the authors that the clots may take two forms and are formed at two different periods. Small microscopic clots composed of two or three leucocytes and a few blood platelets begin to form within a few hours in the sediment floating just above the globular mass. Larger clots are formed later by the breaking-up of the layer of leucocytes and thrombocytes formed between the globular mass and the plasma toward the end of sedimentation.—TZANCK, LUREAU and PITTALUGA. *Chemist and Druggist*, 133 (1940), 21. (A. C. DeD.)

Blood—Conserved. Fresh blood is preferable for transfusion but if conserved blood must be used it should be as fresh as possible. Glucose hould be added to preserved blood daily, 0.5 part per thousand, and none should be used after six days. With old bloods it is wise to first determine the p_H.—B. D. MARTINEZ, *et al. Semana méd.*, (1940), 385; through *Anales farm. bioquím.* (*Buenos Aires*), *Suplemento*, 11 (1940), 25. (G. S. G.)

Blood for Transfusion—Uses and Limitations of. Various workers have examined blood that has been stored and the following is a fair summary of their findings: (1) Some of the red corpuscles shrink, then become dented and crenated, finally shriveling and releasing their contents. (2) For the first ten days hemolysis is not always apparent in the supernatant plasma of the undisturbed blood, though microscopical examination shows that by this time about one-sixth of the total erythrocytes have lost their form. Hemolysis usually becomes obvious after ten to twelve days and gradually diffuses through the supernatant plasma. After twenty-eight days only about one-half of the original number of erythrocytes remain. (3) The number of white cells decreases even more rapidly. Their nuclei break down and they appear as granules in a very much distended cell membrane without cytoplasm. Usually only two-thirds remain normal after the first twenty-four hours and only one-fifth the original number exist after one week. The polymorphonuclear leucocytes cannot perform their function of phagocytosis after twenty-four hours' storing. (4) The ability of the blood to retain its powers of agglutinating specific corpuscles and plasma seems to be variable; it often lasts fourteen days or more. It is important, therefore, to cross group the recipient's serum with the corpuscles from the stored mixture before each transfusion.—ANON. *Pharm. J.*, 145 (1940), 12. (W. B. B.)

Blood Magnesium—Application of the Pulfrich Photometer to the Determination of. The magnesium is precipitated by Briggs' method (*J. Biol. Chem.*, 59 (1924), 255–264), then the phosphorus in the precipitate is determined by a modification of the method of Fiske and Subbarow (*J. Biol. Chem.*, 66 (1925), 375–400) with a Pulfrich photometer.—A. D. MARENZI. *Anales farm. bioquím.* (*Buenos Aires*), *Suplemento* 10 (1939), 70–75; through *Chimie & Industrie*, 43 (1940), 289. (A. P.-C.)

Blood—Preventing the Congealing of. Coagulation is prevented by adding a water-soluble amino acid containing more than one organic radical having a carboxylic group on each basic nitrogen atom, such as the sodium salt of nitrilotriacetic acid or ethylene bis(imino-diacetic acid).—WILLY FAUST and WILLIBALD ENDER, assignors to I. G. FARBENINDUSTRIE A.-G. U. S. Pat. 2,193,717, March 12, 1940. (A. P.-C.)

Blood Urea—Determination of, by the Xanthydrol Method in Presence of Barbiturates. The barbiturate content of blood after anesthesia by intravenous injection is of the order of 0.05 Gm. per liter, and amounts of less than 4 Gm. per liter of barbiturate do not interfere with the determination of urea by the xanthydrol method.—R. VIEILLEFOSSE and P. FEYEL. *Bull. soc. chim. biol.*, 21 (1939), 836–841; through *Chimie & Industrie*, 43 (1940), 109. (A. P.-C.)

Carotene—Effect of, on Arginase Activity. Carotene depresses arginase activity under aerobic conditions, especially when oxygen is bubbled through the sample. Under anaerobic conditions carotene is without effect. The inactivation is said to be due to the oxidation of sulfhydryl activators of arginase, like cysteine and glutathione.—E. E. MARTINSON and V. V. NIKOLSKI. *Biokhimia*, 3 (1939), 778–783; through *Chimie & Industrie*, 43 (1940), 52. (A. P.-C.)

Carotene—Isolation of, from Green Plant Tissue. The isolation of carotene (provitamin A) from green leafy tissue is a tedious task. A new method is presented in which many of the difficult steps of methods now in use are eliminated. Dehydrated alfalfa leaf meal, rich in carotene, is extracted with acetone. The extract is refluxed with solid barium hydroxide octahydrate. This causes chlorophyll and saponifiable lipoids to be removed as a green sludge. The solution is concentrated until a waxy residue containing the carotene separates, leaving flavones and other water-soluble constituents in solution. The waxy residue is extracted with cold acetone; most of the carotene and xanthophyll and some of the lipoidal matter go into solution. This extract is concentrated to an oil, taken up into petroleum solvent and purified of contaminating xanthophyll and lipoidal matter by available methods. The simplicity of the method is due to the procedure devised for removing chlorophyll and saponifiable lipoids. The efficiency of the barium hydroxide octahydrate treatment is dependent on the particle size of the solid and on the ratio of acetone to water in the solution of plant pigments. Proteins, carbohydrates, cellulose, and other plant materials not extractable are not destroyed in this procedure.—H. G. PETERING, P. W. MORGAL and E. J. MILLER. *Ind. Eng. Chem.*, 32 (1940), 1407–1412. (E. G. V.)

Chloralose—Detection of, in Urine. Reflux 20 cc. of urine plus 1 cc. of sulfuric acid plus 0.5 Gm. of charcoal (*e. g.*, norit) for 5 to 10 minutes, cool and filter; to the filtrate in a test tube add 2 to 3 cc. of colorless pyridine and an equal volume of sodium hydroxide solution (presumably 17% to 25%, shake well, and heat 1 to 2 minutes in a boiling water bath. In presence of chloralose (0.1 Gm. per liter or more) the supernatant pyridine turns pink to cherry red. The reaction is also given by chloral, chloroform, bromoform, iodoform, but not by barbiturates,

and is therefore useful to eliminate possibility of poisoning by the latter.—P. CHERAMY. *Ann. Méd. Légale Criminol. Police Sci.*, 19 (1939), 630–631. (A. P.-C.)

Citrated Plasma—Small Scale Filtration of. Filtration of citrated plasma for the purpose of sterilization usually causes clotting. Clotting is due to some unknown factor in crude asbestos which is removed by treatment with $2N$ nitric acid. Pure crystalline asbestos (Gooch fiber) does not cause clotting. A limited amount of citrated plasma can be filtered through crude asbestos pads without clotting, provided that the speed of filtration is sufficiently rapid and that the pad is washed with citrate from time to time. A plan of apparatus and a detailed description of technique are given.—S. R. M. BUSHBY, G. A. H. BUTTLE and L. E. H. WHITBY. *Lancet*, 239 (1940), 131. (W. H. H.)

Cysteine and Cystine—Colorimetric Determination of. A deproteinized filtrate is prepared with 2% metaphosphoric acid. Measure 2 cc. of filtrate into a test tube marked at 4.2 cc. Add 2 cc. of a solution of dimethyl-*p*-phenylenediamine hydrochloride in 4 times normal sulfuric acid, then 0.2 cc. of a solution of 10 Gm. of iron alum in 100 cc. of normal sulfuric acid. Mix and leave in a boiling water bath for 40 minutes. Cool, adjust the volume and determine the extinction coefficient in a Pulfrich photometer with a 5-mm. cell and filter S61. The calculation is as follows: mg. % cysteine $= 7.5\ (E - E_0)v$, where v is the dilution. The color (dark red-violet) is specific for cysteine and is not given by cystine; glutathione and ascorbic acid affect the color only if they are present in a ratio of 25:1 or 5:1, respectively. For the total cysteine determination the deproteinized tissue filtrate is reduced as in the procedure for total glutathione. Added cystine and cysteine are quantitatively recovered. Data are presented on the distribution of cystine and cysteine in plant and animal tissues.—A. FUJITA and I. NUMATA. *Biochem. Z.*, 300 (1939), 264–273; through *Chimie & Industrie*, 42 (1939), 636. (A. P.-C.)

Detoxication—Studies in. VII. The Biological Reduction of *l*-Menthone to *d*-Neomenthol and of *d*-Isomenthone to *d*-Isomenthol in the Rabbit. The Conjugation of *d*-Neomenthol with Glucuronic Acid. The fate of *l*-menthone, *d*-isomenthone and *d*-neomenthol in the rabbit has been studied. It has been found that on administration of *l*-menthone to rabbits, about 30–40% of it is excreted as hydroxy derivatives conjugated with glucuronic acid. Isolation of *d*-neomenthylglucuronide from urine indicates that at least part of the menthone molecule is reduced at the carbonyl group. About 10–15% of the *l*-menthone fed was actually isolated as *d*-neomenthylglucuronide. *d*-Isomenthone is also reduced in the rabbit, *d*-isomenthol (isolated as the glucuronide) being identified as a reduction product. On feeding *d*-neomenthol to rabbits, 67–68% was excreted in the urine combined with glucuronic acid; this figure is of the same order as those previously found for *d*-menthol (70%) and *d*-isomenthol (65%). A method is described, using a Shaffer-Hartmann reagent, for the quantitative estimation of conjugated glucuronic acid in 1 cc. urine after feeding menthol derivatives. The following compounds are described for the first time: *d*-neomenthyl glucuronide and its ammonium salt and *d*-neomenthyl-3:5-dinitrobenzoate.—R. TECWYN WILLIAMS. *Biochem. J.*, 34 (1940), 690. (F. J. S.)

Dihydrofollicle Hormones and Analogs and Their Derivatives. A process for the manufacture of dihydrofollicle hormone and its unsaturated analogs, dihydroequilin and dihydroequilenin, and their derivatives, comprises gradually introducing a solution of follicle hormone, equilin, equilinin or their 3-derivatives, into an aqueous suspension of sugar and yeast, allowing the mixture to ferment, thereafter extracting the mixture by means of an organic solvent wherein the partially hydrogenated hormone is soluble, and isolating the hormones from the extract.—WALTER SCHOELLER, assignor to SCHERING CORP. U. S. pat. 2,184,167, Dec. 19, 1939. (A. P.-C.)

Diphosphopyridine Nucleotide—Manometric Method for the Determination of. A method is described for the manometric determination of diphosphopyridine nucleotide (cozymase) in aqueous solutions containing 1 to 10γ of nucleotide per cc. The method is based on the catalysis by diphosphopyridine nucleotide of the breakdown of hexose diphosphate in the presence of arsenate and an aqueous muscle extract freed from nucleotide by charcoal adsorption as the source of required enzymes.—BERNHARD J. JANDORF, FRIEDRICH W. KLEMPERER and A. BAIRD HASTINGS. *J. Biol. Chem.*, 138 (1941), 311. (F. J. S.)

Diphosphopyridine Nucleotide—Method for the Isolation of. A simplified method for the isolation of pure diphosphopyridine nucleotide (cozymase) is described. The method involves as a new step the adsorption of diphosphopyridine nucleotide on charcoal from aqueous solution and the elution therefrom with water-amyl alcohol mixture.—BERNHARD J. JANDORF. *J. Biol. Chem.*, 138 (1941), 305. (F. J. S.)

Estrogenic Hormones. A discussion.—CARLOS E. CARDINI. *Tribuna farm.*, Tucuman, 5 (1940), 29. (G. S. G.)

Follicle Hormones—Isolating, from the Urine of Pregnant Individuals. A method of isolating follicle hormones from crude solutions containing small amounts of follicle hormones together with a relatively large amount of other substances of diverse character which normally accompany the hormones, comprises subjecting the starting material to a steam distillation whereby the volatile phenols are removed, treating the same with compounds of alkaline reaction whereby the neutral impurities are rendered insoluble, acylating the pretreated material in alkaline solution and saponifying the acylation products obtained thereby.—ERWIN SCHWENK and FRIEDERICH HILDEBRANDT, assignors to SCHERING A. G. U. S. pat. 2,178,109, Oct. 31, 1939. (A. P.-C.)

Follicle-Stimulating Hormone of the Anterior Pituitary—Purification of. The purification includes the following steps: (1) Extraction of acetone desiccated glands with 40% alcohol. (2) Precipitation from 50% acetone at a p_H 4.5. (3) Ammonium sulfate fractionation in which the hormone is reprecipitated several times between 0.5 and 0.67 SAS. (4) Precipitation from 33% acetone at p_H 4.8. (5) Precipitation from 67% alcohol. (6) Removal of less active material by saturation with NaCl at p_H 4.1.—HEINZ L. FRAENKEL-CONRAT, MIRIAM E. SIMPSON and HERBERT M. EVANS. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 627. (A. E. M.)

Friedman Test for Pregnancy. The test consists in injecting urine of a pregnant woman into the marginal ear vein of a rabbit; in 48 hours the concentrated gonadotropic hormones will have developed corpora lutea or corpora hemorrhagica in the rabbit's ovaries, or both. There are a few false negatives or positives, due occasionally to faulty technique or to the fact that certain other conditions may cause a concentration of the hormone. False positives may be produced by hydatidiform mole, chorion epithelioma, menopause or menstrual disorders. False negatives will occur if the test is

made before the seventh week of pregnancy.—LAURENCE M. RANDALL, *et al. J. Am. Med. Assoc.*, 114 (1940), 471. (G. S. G.)

Gluconic Acid—Biological Production of. A biological method for the production of gluconic acid from glucose is described in which *Bact. suboxydans*, a moderately oxidizing acetic acid organism, is used with intense aeration of the medium. The most favorable initial concentration of glucose is 15%, but glucose may be added during fermentation to make the total glucose up to 30–35%. Further increase in concentration is impracticable owing to crystallization of calcium gluconate from solution due to the necessity of adding chalk for partial neutralization. Almost quantitative conversion into gluconic acid or its calcium salt is obtained if the p_H is initially controlled to allow good growth of the organism and subsequently is not allowed to fall below p_H 3.5 and preferably p_H 4.0.—K. R. BUTLIN and W. H. D. WINCE. *J. Soc. Chem. Ind.*, 58 (1939), 363. (E. G. V.)

Glucuronides—Photometric Estimation of Conjugated, in Urine. The application of the previously described naphthoresorcinol reaction method (*Compt. rend. soc. biol.*, 126 (1937), 916–918) to normal and diabetic urine is described.—M. FLORKIN and R. CRISMER. *Compt. rend. soc. biol.*, 131 (1939), 1277–1280; through *Chimie & Industrie*, 43 (1940), 111. (A. P.-C.)

Glutathione—Colorimetric Determination of Total. To 5 cc. of tissue filtrate deproteinized with metaphosphoric acid add 4 cc. of 1% mercuric acid solution and 0.5 cc. of twice normal hydrochloric acid, mix and add 0.5 cc. of 50% sodium acetate; pass hydrogen sulfide through the solution and leave under hydrogen sulfide overnight, then filter; to 8 cc. of filtrate add 0.3 cc. of twice normal hydrochloric acid, remove the hydrogen sulfide under vacuum and make up the volume to 8 cc. Then treat with sodium nitroprusside and evaluate the red color in the Pulfrich photometer.—A. FUJITA and I. NUMATA. *Biochem. Z.*, 300 (1939), 257–263; through *Chimie & Industrie*, 42 (1939), 636. (A. P.-C.)

Glycocyamine—Micromethod for the Determination of, in Biological Fluids and Tissue Extracts. A micromethod is described for the determination of glycocyamine in biological fluids and tissue extracts. The advantages of this method over those previously described are that added glycocyamine is recovered quantitatively; it is faster and more convenient.—JACOB W. DUBNOFF and HENRY BORSOOK. *J. Biol Chem.*, 138 (1941), 381. (F. J. S.)

Grass Pollens—Purification of Extracts of. Fractionation of aqueous grass pollen extracts with water-miscible organic solvents (dioxane, acetone) promotes purification of these extracts. The fractionation is carried out at 5° to 7°. Precipitation of the purified extracts with high concentrations of ammonium or sodium sulfate affords further purification.—C. H. BOATNER and B. G. EFRON. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 460. (A. E. M.)

Histaminase. The authors presented their physiologic evidence on the relation of histaminase and histamine in man. The development of such studies has been slow and impeded by the lack of a readily available method for quantitative isolation of crystalline histamine from blood and tissues. They observed 150 patients with various clinical conditions to whom histaminase had been administered orally. No untoward effects with doses as high as 125 units in a day were noted in any of these patients. There is evidence to show that histamine or a histamine-like substance is a factor in the pathogenesis of certain clinical disorders characterized by local or general hypersensitiveness and in these clinical disorders histaminase has been used in an effort to inhibit the action of these substances. From the results of this preliminary report and on the basis of our experience and that of others, histaminase seems to be an effective therapeutic agent in certain cases of clinical hypersensitiveness.—G. M. ROTH and B. T. HORTON. *Bull. N. Y. Acad. Med.*, 16 (1940), 570. (A. C. DeD.)

Hormone Preparations—Biological Determination of. The differences in the type of blood sugar curves given by ordinary insulin as compared to the same plus epinephrine, and to protamin insulin are noted. The question of standard units for the various esters of estradiol, and for testosterone and gonadotropin is considered.—B. RÖNNEMARK. *Farm. Revy*, 39 (1940), 565. (C. S. L.)

Human Serum as a Blood Substitute. Whole blood is the ideal restorative fluid, especially in anemia and hemorrhage. In cases of burns and traumatic and operative shock, diminished volume or plasma cell ratio may be as well reconstituted by serum or saline solutions. Blood transfusion is valuable but has two handicaps, the delay necessary to typing and compatibility tests, and occasional reactions, both due to the corpuscular elements in the blood. Infusions of dextrose or saline are useful but of transitory value. Experiments on dogs demonstrated the superiority of serum over saline in transfusion. Serum requires no particular care in handling, no preliminary testing and may be preserved for a long time. It is an adequate substitute for blood unless there is extreme loss of erythrocytes. —SIDNEY O. LEVINSON, *et al. J. Am. Med. Assoc.*, 114 (1940), 456. (G. S. G.)

Inorganic Ions—Behavior of, during Ultrafiltration of a Protein Solution Containing Sodium Chloride. When a protein solution containing sodium chloride was subjected to ultrafiltration at the isoelectric point of the protein the concentration of both sodium and chlorine ions was the same in the ultrafiltrate as in the original solution. At any p_H below the isoelectric point of the protein the ultrafiltrate contained more sodium and less chlorine ions, and above the isoelectric point the reverse was true. This is in agreement with the Donnan equilibrium.—E. J. BIGWOOD and M. ERRERA. *Bull. soc. chim. biol.*, 21 (1939), 737–744; through *Chimie & Industrie*, 42 (1939), 963. (A. P.-C.)

Insulin Preparations. The hormone is treated with a salt of magnesium in presence of a retarding salt which produces a slower resorption.—I. G. FARBENINDUSTRIE A.-G. Belg. pat. 435,158, July 31, 1939. (A. P.-C.)

Lactic Acid—Demonstration of Rapid Production of, in Oral Cavity. The rapid production of lactic acid in the oral cavity and *in vitro* is demonstrated as the result of the action of oral microörganisms on certain carbohydrates.—ISAAC NEUWIRTH and JULIUS A. KLOSTERMAN. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 464. (A. E. M.)

Lanthionine—Isolation of a New Sulfur-Containing Amino Acid, from Sodium Carbonate Treated Wool. A new thio ether diamino acid, $HOOC\text{-}CH(NH_2).CH_2.S.CH_2.CH(NH_2).COOH$, β-amino-β-carboxyethyl sulfide, has been isolated by acid hydrolysis of wool that has been boiled for one hour with 2% sodium carbonate solution. It crystallizes in plates which are difficultly soluble in water and readily soluble in dilute acids and alkalies. It is optically inactive and decomposes at about 304°. Because it was first isolated from wool, and contains sulfur, the name lanthionine has been given to this amino acid.—MILLARD J. HORN, D. BREESE JONES and S. J. RINGEL. *J. Biol. Chem.*, 138 (1941), 141. (F. J. S.)

Lead Content of Human Hair. Well-cleaned hair was found to contain very large amounts of lead. The color of hair is apparently related to its lead content since black hair contains more than brown, and brown more than gray. Hair of Hindu women, who use red lead as a cosmetic, contains up to 508 mg. per Kg. The hair of unexposed individuals ranges from 20.0 to 22.7 mg. per Kg., and for some nationalities up to 42.4 mg. per Kg. Quantities of lead were found in the urine and feces of individuals whose hair shows a high lead content. This and other factors indicated to the authors that lead is absorbed by the system and eliminated through the hair.—RAI BAHADUR, K. N. BAGCHI, H. D. GANGULY and J. N. SIRDAR. *Indian J. Med. Research*, 27 (1940), 777–791. (W. T. S.)

Lipolysis in Raw Milk. Raw milk heated momentarily and homogenized at 70°, 105°, 115°, 125°, 135° and 145° F. underwent lipolysis in every case. The maximum fat splitting occurred within the temperature range 105–125° F. Temperatures of 135–145° F. inhibited but did not entirely prevent lipolysis accelerated by homogenization.—I. A. GOULD. *Ind. Eng. Chem.*, 32 (1940), 876–877. (E G V.)

Male Sex Hormone—Hyperemia as a Test of. Testosterone propionate induces hyperemia of the scrotal region and a precocious descent of the testicles in infantile male rats. The threshold value of both effects is 0.25 mg. Hyperemia can also be obtained in castrated animals, a fact which indicates a direct effect of testosterone propionate on the cutaneous circulation. Androsterone benzoate, estradiol benzoate and progesterone do not produce this effect. The examination of further male hormone compounds will show whether this action of testosterone is specific or not. If it is specific, the scrotal hyperemia could be used as a test to identify testosterone. Of all the synthetic hormones tried in these experiments testosterone alone acts like the natural hormone. This fact seems to be important for future hormone therapy; for the aim of clinical treatment must be the use of those hormonal substances whose effects resemble most closely those of the natural sex hormone. An advance toward this goal can be seen in the combined administration of male and female hormones proposed by the authors for the treatment of hypertonia and high blood pressure (Steinach, Peczenik and Kun 1938).—E. STEINACH and H. KUN *Lancet*, 238 (1940), 688. (W. H. H.)

Nicotinic Acid—Determination of, in Urine. To 1 or 2 cc. of urine in a 10-cc. volumetric flask add 6 cc. of cyanogen bromide and 1 cc. of aniline and make to volume; the yellow reaction color develops rapidly and is measured in a Pulfrich photometer using filter S47. The amount eliminated in the urine of rats was about 0.140 mg. per 100 cc. and in that of man about 1 mg. per 100 cc.—F. DEL REGNO. *Boll. soc. ital. biol. sper.*, 14 (1939), 398–400; through *Chimie & Industrie*, 43 (1940), 197. (A. P.-C.)

Nicotinic Acid—Estimation of, in Animal Tissues, Blood and Certain Foodstuffs. II. Applications. The author summarizes his work as follows: 1. The cyanogen-*p*-aminoacetophenone method of Harris & Raymond was applied to the estimation of nicotinic acid in numerous animal tissues, medicinal preparations, blood, dairy products and cereals. The results were compared with the reputed biological pellagra-preventing values, as given by other authors or as found in new experiments in this institute. 2. Results for animal tissues run parallel with the biological values. The highest values were found for liver and adrenals. Salmon is rich in nicotinic acid. Eye lens, normal and with cataract, contains a fair amount. 3. Egg white was found to be deficient, both in chemical and biological tests. Milk was also found to be surprisingly low and this was confirmed in experiments on canine blacktongue. 4. In horse and sheep bloods about 4.7μg. of nicotinic acid per cc. were found, all of it in the red cells. The whole of the nicotinic acid seems to be bound to substances which are insoluble in excess of ethyl alcohol and in acetone. 5. Substances are present in cereals which give a non-specific color reaction and complicate the estimation of the active nicotinic acid. It seems probable that extraction with water may be used to separate the active antiblacktongue principle from the interfering substances. 6. Storage of certain food extracts over a period of years did not diminish their contents of nicotinic acid. 7. Cozymase was found to be quantitatively hydrolyzed and recovered (*viz.* 88–98%). 8. Nicotinic acid is present in various forms of combination and an attempt was made at a provisional differentiation of the different fractions. Certain tissues, namely liver, adrenals, heart and skeletal muscle, appeared to contain various fractions, differentiated by their insolubility in ethyl alcohol. 9. It appears that little or no free nicotinic acid is present in living animal tissues but that on autolysis it is rapidly set free from coenzymes or other combined forms.—E. KODICEK. *Biochem. J.*, 34 (1940), 724. (F. J. S.)

Nitrobenzene—Micropolarographic Determination of, in Blood. Nitrobenzene can be determined in blood by means of Heyrovsky's polarographic method, which consists in electrolyzing the liquid to be analyzed by means of a mercury-drop electrode. The determination can be carried out on 2 cc. of blood serum and is sensitive to 0.002 mg. of nitrobenzene per 100 cc. of blood.—J. TEISINGER. *Mikrochemie*, 25 (1938), 151–156; through *Chimie & Industrie*, 42 (1939), 450–451. (A. P.-C.)

Nitrogen in Blood—Modification of the Micro-Kjeldahl Determination of Noncoagulable. The modification is based on deproteinization of 0.1 cc. of blood with zinc hydroxide on a boiling water bath for 3 minutes. The influence of the volume of the distillate on iodometric titration is stressed. A simplified calculation is given and a table for conversion of thiosulfate into mg. of nitrogen per 100 cc. of blood.—L. NASSI. *Diagnostica tec. lab.*, 9 (1938), 649–660; through *Chimie & Industrie*, 43 (1940), 197. (A. P.-C.)

Pantothenic Acid and the Skin. A brief editorial calling attention to the role of certain factors of the vitamin B complex, especially pantothenic acid, in the maintenance of a normal skin and hair growth.—*Southern Med. J.*, 34 (1941), 100–101. (W. T. S.)

Pantothenic Acid—Discovery, Isolation and Synthesis of. A review covering the discovery, isolation and synthesis, and nutritional application of pantothenic acid.—C. R. ADDINALL. *Merck Report*, 50 (1941), No. 1, 41–44. (S. W. G.)

Polypeptides—Determination of, in Biological Fluids Rich in Thiocyanates. Regardless of what catalyst is used, 20% to 30% of the thiocyanate nitrogen escapes conversion to ammonia in the Kjeldahl digestion; hence it is not possible accurately to determine polypeptide nitrogen or nonprotein nitrogen in fluids containing thiocyanates.—P. VALDIGUIÉ. *Bull. soc. chim. biol.*, 21 (1939), 609–616; though *Chimie & Industrie*, 42 (1939), 963. (A. P.-C.)

Prothrombin—Estimation of, in Human Plasma. The following conclusions are given: 1. The estimation of plasma prothrombin, by a modification of the method of Warner, *et al.*, is described. 2. The quantitative aspects of the different reactions involved are considered. 3. Evidence is presented that the method gives a quantitative measure of prothrombin titers, or at least that there is no serious departure from a genuinely quantitative

scale. 4. The principles underlying other methods are briefly considered.—FREDA KATHARINE HERBERT. *Biochem. J.*, 34 (1940), 1554. (F. J. S.)

Pyruvic Acid—Elimination of Acetoacetic Acid in the Determination of, by Lu's Method. In the presence of significant amounts of acetoacetic acid, false values may be obtained unless the acetoacetic acid is removed. The removal of acetoacetic acid from the blood containing pyruvic acid is made possible by the following procedure: 0.1 to 0.5 cc. of blood, stabilized with sodium iodoacetate, is precipitated with 4.5 cc. of 0.0747*N* H_2SO_4 and 1.0 cc. of 5% sodium tungstate. After centrifugation and quantitative removal of the supernatant, the precipitate is washed with 2 cc. of a solution consisting of 4.5 cc. of 0.0747*N* H_2SO_4, 1 cc. of sodium tungstate and 0.5 cc. of H_2O. To the combined supernatants in a 15-cc. centrifuge tube 0.5 cc. of concentrated HCl (sp. gr. 1.1878) is added and the tube placed in a boiling water bath for 1 hour. An amount of 40% NaOH which will just neutralize the HCl is added. The solution is allowed to cool; 2,4-dinitrophenylhydrazine solution is added and the method of Lu is followed thereafter. Results obtained indicate the efficiency of this step and the above procedure is applicable to other biological materials.—SAMUEL ELGART and NORTON NELSON. *J. Biol. Chem.*, 138 (1941), 443. (F. J. S.)

Quinacrine—Detection and Estimation of, in Blood. The blood, plasma or centrifuged corpuscles are mixed with an equal volume of 60% potassium hydroxide solution, warmed until dissolved, and extracted with Hecht's mixture (8 parts of thiophen-free benzene and 2 parts of isoamyl alcohol); this extracts quinacrine and blood pigments. The quinacrine is extracted from the non-aqueous solution by several small portions of decinormal hydrochloric acid, the acid solution is made alkaline, and the quinacrine is extracted with a small volume of isoamyl alcohol and estimated colorimetrically.—C. LATASTE, NGUYEN-VAN-LIEN and M. E. FARINAUD. *Compt. rend. soc. biol.*, 130 (1939), 422–424; through *Chimie & Industrie*, 42 (1939), 450. (A. P.-C.)

Ragweed Pollen—Preparation of Purified Extracts of. Fractionation of aqueous ragweed pollen extracts with water miscible organic liquids produces purification and concentration of the allergens of these extracts. Fractionation of the extracts purified by this method with high concentrations of sulfate salts produces further purification and concentration of the allergenic factors.—C. H. BOATNER, B. G. EFRON and M. R. PABST. *Proc. Soc. Exptl. Biol. Med.*, 45 (1940), 637. (A. E. M.)

Serum Proteins—Comparison of Methods of Estimation of. Three types of procedure were studied: 1. The refractometric method of Reiss which requires a conversion table. 2. The colorimetric method used by clinical laboratories. 3. The gravimetric method. The first is excellent for normal sera but the percentage of error is too large for clinical procedure. The second is practical and accurate for clinical procedure. The third has proved less practical and accurate, even in evaluation of the albumin/globulin ratio.—RAUL NICO. *Rev. facultad cienc. quím.*, 14 (1939), 60. (G. S. G.)

Serum Proteins—Human, Studies on. II. Crystallization of Human Serum Albumin. The author gives the following conclusions: 1. A method is given for the isolation of crystalline albumin from human serum. 2. The crystalline albumin is associated with a small amount of free fatty acid that cannot be removed without first denaturing the albumin. 3. Solubility measurements indicate that the crystalline human serum albumin is more homogeneous than the corresponding albumin isolated from horse serum.—FORREST E. KENDALL. *J. Biol. Chem.*, 138 (1941), 97. (F. J. S.)

Siliceous Dusts—Detection of, in the Lungs by Microscopy and Fluorescence. The method is based on the use of fluorochrome solutions, such as auramine solutions. The tissue section is treated for 30 minutes with a mixture of alcohol and ether, then for 5 to 10 minutes with a 1:1000 aqueous solution of auramine. The quartz particles in the lungs appear as golden yellow fluorescent crystals while the tissues rapidly lose their fluorescence. The luminescence of the quartz particles makes it possible to examine them when smaller than has heretofore been possible.—M. OBERDALHOFF. *Arch. Gewerbepath.*, 9 (1939), 435–442; through *Chimie & Industrie*, 43 (1940), 208. (A. P.-C.)

Silicon—Spectrographic Determination of, in Blood. This determination is useful for detecting silicosis in its early stages. Gravimetric and colorimetric determinations gave disagreeing results (6 to 7 mg. and 0.4 mg., respectively, per 100 cc. of blood). Spectrographic determination gave higher results (13 to 18 mg.). The technique of the determination is described.—CLARA RICHTER. *Arbeitsschutz*, (1939), 141–144; through *Chimie & Industrie*, 42 (1939), 810. (A. P.-C.)

Soluseptasine—Antihemolytic Action of. Previously one of the present authors (A. C. R.) has been studying the hemolytic properties of such substances as: snake venoms, bile salts, saponins, soaps, etc. Since the mode of action of sulfanilamide and related drugs is obscure, the authors have determined whether one of these drugs, the colorless, water-soluble soluseptasine (disodium *p*-(γ-phenylpropylamine) benzene sulfonamide-α,γ-di-sulfonate), has any action on any of the above hemolytic substances, and on cobra venom in particular. A 0.05% cobra venom solution in saline and a 5% suspension of human RBC were used in a total volume of 1 cc. The venom and the drug were mixed, incubated for half an hour and then the RBC added. Readings were taken at 37° C. at intervals up to two hours. Then the tubes were placed in an ice chest and readings taken next day. Soluseptasine retarded the hemolysis caused by cobra venom, bile salts, saponin and cyclamin. Certain bacterial hemolysis were also neutralized by soluseptasine. Its action on soap hemolysis was irregular.—A. C. ROY, D. C. MAZUMDAR and P. MUKHERJEE. *Indian J. Med. Research*, 28 (1940), 235–240. (W. T. S.)

Tannins as Hydrogen Carriers in Biological Oxidation. A correlation has been found, rejecting two anomalous cases, between the tannin content of leaf tissue and its rate of oxygen uptake in a fine mince. This confirms previous ideas that tannins function as hydrogen carriers in biological oxidation systems. The properties of the *o*-quinone of tea tannin as hydrogen acceptor are discussed. Apparently, it does not require the presence of cozymase. The apparent specificity of a plant oxidase for tannins from its own species is considered to be due to an "immunity" of the enzymes of a given species to the toxic effects of its own tannins.—E. A. HOUGHTON ROBERTS and S. N. SARMA. *Biochem. J.*, 34 (1940), 1517. (F. J. S.)

Threonine—Determination of, by the Use of Periodate. A convenient method for the determination of threonine in protein hydrolysates has been described, based on the action of periodic acid. The method is considered superior, in many respects, to that described by Block and Bolling. Conditions have been developed for the selective removal of acetaldehyde which is absorbed in bisulfite. Other applications of this procedure are being made. Values for threonine of approximately 3.5% for casein and 1.4% for gelatin are reported.—LEO

A. SHINN and BEN H. NICOLET. *J. Biol. Chem.*, 138 (1941), 91. (F. J. S.)

α-Tocopherol—Biological Activity of the Oxidation Products of. The products formed by the oxidation of α-tocopherol with $AgNO_3$ and $FeCl_3$ are spectroscopically identical. Both show subminimal activity in rat tests when given in oral doses of 5 mg. We cannot confirm the finding of Emerson, *et al.* (1939) that α-tocoquinone prepared in this manner has substantially the same activity as the parent compound. It does not appear that any of the known oxidation products of α-tocopherol are likely to take part in reversible oxidation system in the body. The biological activity of the red *o*-quinone obtained by oxidizing α-tocopherol with nitric acid is relatively high, but this is probably attributable to the integrity of the oxygen ring and the phytyl side chain. The only plausible suggestion regarding the nature of reversible systems affecting the oxidation of vitamin E is that of Golumbic and Mattill (1940) which relates α-tocopherol to the corresponding free phenoxyl radical.—R. R. RIDGWAY, J. C. DRUMMOND and M. D. WRIGHT. *Biochem. J.*, 34 (1940), 1569. (F. J. S.)

Transfusion and Blood Inheritance. Historically, transfusion is preceded by the tradition of drinking blood for increased vitality. Transfusion from the middle ages on to the 19th century was a risk for the patient until 1899, when Shattuck observed that some bloods caused agglutination in the patient's blood while others did not. Landsteiner, Jansky and Moss developed the classification of bloods into four groups of agglutinins which is the basis for pretransfusion blood typing and matching as practiced to-day. The technique of preparing normal serum, immuno-serum and dry serum is described. Agglutinins and agglutinogens are discussed together with the inheritance of blood groups. A child will always inherit his blood type from one of his parents. Blood agglutinations to establish paternity are dependable only in excluding but not in proving relationship.—ARTURO A. BRUNO. *Rev. Col. Farm. Nac.*, 6 (1939), 211. (G. S. G.)

Urea—Accurate Microdetermination of, in Biological Fluids by the Oxidation of Dixanthylurea with Iodate. Deproteinize 1 cc. of serum with 1 cc. of Tanret reagent (2.71 Gm. of mercuric chloride, 7.2 Gm. of potassium iodide, 66.6 cc. of acetic acid diluted to 100 cc. with water) and centrifuge. Add to the clear solution 1 cc. of acetic acid and 0.1 cc. of xanthydrol in methanol, centrifuge after 1 hour and wash with 3 × 1 cc. of alcohol. Transfer the precipitate to a small porcelain dish and evaporate to dryness with 0.1 Gm. of anhydrous sodium sulfate. Transfer the dry powder to a special tube containing 0.2 Gm. of potassium iodate and a crystal of sodium tungstate, washing out the last traces with concentrated sulfuric acid. Seal off the tube, heat for 30 minutes at 200° C. and pour the cooled contents into a distillation flask. Distil into 10 cc. of 5% potassium iodide solution. Titrate the iodine with twenty-fifth normal sodium thiosulfate. Mg. of urea = $0.103 \times N_t \times f$, where N_t is the cc. of thiosulfate used and f the normality factor.—I. CLAUDATUS and M. BOTEZATU. *Biochem. Z.*, 300 (1939), 325–327; through *Chimie & Industrie*, 42 (1939), 795. (A. P.-C.)

Urea—Determination of, by Xanthydrol and Hypobromite Methods. The results obtained by both methods on the same 100 samples of urine and blood serum are tabulated. The values for urea obtained by the xanthydrol method on urine are about 20% lower than the values obtained with the hypobromite method. The quantities of urea found in the serums by the hypobromite method are 0.08–0.1 Gm. per liter greater than those found by the xanthydrol procedure. The method employed should be indicated in reporting urea determinations.—H. QUERE. *Bull. trav. soc. pharm. Bordeaux*, 77 (1939), 149–55. (S. W. G.)

Urobilin—Some Improvements in Methods for Determining, in Blood. After a discussion of the various methods the following procedure is given as the most accurate: addition to the serum of distilled water and Grigaut's reagent; saturation with sodium sulfate, boiling and filtration (this removes bilirubin); addition of thymol-chloroform to the filtrate, and separation of the liquids; addition of absolute alcohol and ammonia to the chloroform solution and filtrate; filtrate plus saturated zinc acetate solution produces a characteristic green fluorescence for the determination. An alternative, but less accurate, method is the substitution of a modified Fouchet reagent for the Grigaut reagent.—C. BECCARI and A. BALDESI. *Diagnostica tec. lab.*, 9 (1938), 720–726; through *Chimie & Industrie*, 42 (1939), 34. (A. P.-C.)

Vitamin Concentrate—Preliminary Treatment of. In preparing a vitamin concentrate by high-vacuum distillation of a fish oil containing vitamin and also absorbed gases which would cause at least partial oxidation and thermal destruction of the vitamin during distillation, the absorbed gases and oxidizing substances are removed from the oil previous to distillation by subjecting the oil in a thin film to extreme agitation and to a pressure of less than about 0.005 mm., until the internal pressure of the gas in the oil is below about 0.015 mm. An apparatus with rotating plates may be used.—KENNETH C. D. HICKMAN, assignor to DISTILLATION PRODUCTS, INC. U. S. pat. 2,180,051, Nov. 14, 1939. (A. P.-C.)

Vitamin A—Assay of, with the Photoelectric Colorimeter. Results obtained using the Cenco photelometer and the antimony trichloride reaction for vitamin A determination are reported. Comparative determinations were made on a reference cod liver oil, 3000 units, shark liver oil, 20,000 units and a liver oil concentrate, 55,000 International Units per Gm. The photelometer gives consistent and reproducible results on the blue reaction. The blue color fades rapidly; nevertheless, with close timing it is possible to make duplicate determinations check.—R. B. FRENCH. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 351–352. (E. G. V.)

Vitamin A Content of Shanghai Foods. II. The Colorimetric Assay of Twenty-Five Common Fishes. The blue values of the edible flesh of twenty-five of the most common Shanghai fishes were determined, from which the approximate vitamin A potency was calculated. The highest values were obtained from the flesh of the carp, herring and eel, which gave 171, 140 and 131 I. U. per 100 Gm., respectively. The vitamin A values obtained did not run proportionate to the amount of fat present.—PETER G. MAR. *Chinese J. Physiol.*, 16 (1941), No. 1, 67–72. (F. J. S.)

Vitamin A Deficiencies—Vitaminized Natural Food Oils Suggested for. The author has presented some problems of providing the masses in certain parts of the British Empire with a diet adequate in vitamin A. The introduction of red palm oil (a rich source of provitamin A) as an article of diet would reduce incidence of xerophthalmia. Where such new foods are difficult to introduce, it would be necessary to vitaminize one of the common articles of diet such as peanut oil. Fortifying agents as liver oil concentrates, carotene, chlorophyll, etc., could be used for this purpose. A distribution plan might be worked out involving the post office facilities in each village. —D. FITZGERALD MOORE. *J. Trop. Med. Hyg.*, 43 (1940), 257–258. (W. T. S.)

Vitamin B_1—Hydrolysis of, in Aqueous Solution. Vitamin B_1 hydrochloride when heated at 120° C.

in an aqueous solution gave 2-methyl-5-hydroxymethyl-6-aminopyrimidine hydrochloride (which decomposes at 219° C.) and 4-methyl-5-β-hydroxyethylthiazole hydrochloride (which melts at 95° to 96° C.).—A. WATANABÉ. *J. Pharm. Soc. Japan*, 59 (1939), 133–134; through *Chimie & Industrie*, 43 (1940), 321. (A. P.-C.)

Vitamin B_2 (Lactoflavin). I. The lactoflavin contents of the various muscles of an animal vary widely according to their functions and their glycogen contents. The greater portion of the vitamin is combined in the muscles in the form of a high molecular weight complex (yellow ferment). Determination of lactoflavin can be based on its conversion into lumiflavin.—J. SCHORMÜLLER. *Z. Untersuch. Lebensm.*, 77 (1939), 1–18; through *Chimie & Industrie*, 42 (1939), 856. (A. P.-C.)

Vitamin C—Existence of a Relationship between the Oxidoreduction Potential and the Concentration of, in a Medium Containing Molecular Oxygen. Ascorbic acid solutions when brought into contact with atmospheric oxygen develop a well-defined oxidoreduction potential. A study of this potential shows that the reducing activity of vitamin C increases regularly with the concentration up to decinormal. The equilibrium potential is reached in the neighborhood of four-tenths-normal; its value is about +0.309 volt, the p_H of the solution being 2.6 and measurements being carried out at 20° C. It corresponds to an r_H of about 15.8. This potential, governed by the equilibrium between the activity of the unchanged vitamin and that of the oxygen in the solution exposed to the atmosphere, is called the simple normal potential of ascorbic acid. —N. BEZSSONOFF and M. WOLOSZYN. *Compt. rend. soc. biol.*, 129 (1938), 222–224; through *Chimie & Industrie*, 41 (1939), 957. (A. P.-C.)

Vitamin C—Optimum Requirements of Persons Living on a Bengali Diet. The daily requirement of vitamin C in the average American and European diet is reported to be as low as 15 mg. and as high as 60 mg. The present article deals with the procedure and results (with discussion) of some experiments undertaken to determine the vitamin C requirement in the Bengali diet which is mainly carbohydrate as contrasted to the American and European diet which is rich in protein. The actual daily requirement was found to be 44.2 mg. and the daily intake necessary to provide this was 66.2 mg. An excess of carbohydrate in the diet did not influence the utilization of vitamin C in the body, but larger amounts are necessary in moist and warm places due to excessive sweating. The body under large dosage apparently develops a greater power to destroy vitamin C.—N. M. BASU and G. K. RAY. *Indian J. Med. Research*, 28 (1940), 133–141. (W. T. S.)

Vitamin C Problems. Daily administration of methylnarcotine and glucuronic acid in proper dosage to guinea pigs on a scorbutigenic ration prevents the development of scurvy. With a narcotine-free ration, *l*-ascorbic acid does not prevent scurvy; the missing factor may be supplied by narcotine or methylnarcotine. Hence, *l*-ascorbic acid is not the antiscorbutic vitamin.—O. Rygh. *Z. Vitaminforsch.*, 8 (1938–1939), 166–177; through *Chimie & Industrie*, 42 (1939), 680. (A. P.-C.)

Vitamin C—Sources of the Reversible Oxidized Form of, and Its Stability. The reversible oxidized form of vitamin C is very unstable toward heat; its stability toward air at ordinary temperature is also low; *e. g.*, the antiscorbutic potency of eggplant juice exposed to the air decreases about 14% in one hour and 40% in three hours.—N. S. YARUSOVA, V. YA. BOGDANOVA and M. YA. EFIMOVA. *Voprosy Pitaniya*, 8 (1939), No. 2, 39–44; through *Chimie & Industrie*, 43 (1940), 338. (A. P.-C.)

Vitamin C—Study of, for Children. Deficiencies are studied by estimation of vitamin C in the blood and urine and by capillary resistance. Early recognition of avitaminosis is obtained by these routine studies.—R. BRUCHER ENCINA. *Arch. Hosp. Ninos Roberto del Rio*, 8 (Sept. 1938); through *Notic. Med. Mund.*, 4 (1939), 12. (G. S. G.)

Vitamin D—Spectrographic Determination of. Saponification of the sample destroys from 20% to 30% of the vitamin D, and this loss must be taken into account. Cholesterol does not seem to exert any appreciable effect on the determination; on the other hand, it is necessary to remove vitamin A. It should be noted that if this elimination is carried out by means of acid clay, the latter also removes part of the vitamin D.—Z. NAKAMIYA and K. TAKIZAWA. *Sci. Papers Inst. Phys. Chem. Research, Tokyo* 36 (1939), 904–909; through *Chimie & Industrie*, 43 (1940), 412. (A. P.-C.)

Vitamin E. A discussion.—LUIS N. PIZZORNO. *Tribuna farm., Tucuman*, 5 (1940), 41. (G. S. G.)

Vitamin E—Specificity of the Action of. The experiments carried out confirmed the results of Karrer relative to the high estrogenic activity of synthetic inactive α-tocopherols. It can be admitted that a compound possessing vitamin E activity necessarily contains free or esterified phenolic groups or quinone groups.—F. V. WERDER, T. MOLL and F. JUNG. *Hoppe-Seyler's Z. physiol. Chem.*, 257 (1939), 129–139; through *Chimie & Industrie*, 42 (1939), 679. (A. P.-C.)

Vitamin K. A general discussion about vitamin K includes references to the preliminary work of Dam and Almijist. Its chemical properties and its origin as a decomposition product and also its extraction from alfalfa leaves and fish meal are described. Absorption necessitates ingestion of fats. Its therapeutic application is its use before and after operations to prevent undue hemorrhage. It is of no value to hemophilics.—MESSIAS DO CARMO. *Gaz. Farm.*, 8 (Mar. 1940), 3. (G. S. G.)

Vitamin K. The author briefly reviews the discovery, structural work, synthesis and action of vitamin K.—H. GUYOT. *Schweiz. Apoth.-Ztg.*, 78 (1940), 281. (M. F. W. D.)

Vitamin K—Nutritional Deficiency of, in Man. The answer to the question, whether a spontaneous deficiency of vitamin K, as determined by a decreased plasma-prothrombin level, may arise in man in the absence of jaundice and as the result of a dietary deficiency of vitamin K, appears to depend on the method used for determining the prothrombin time. If the plasma prothrombin be determined by the general method in use (Quick, *et al.*, 1935), the answer is always "no." If the deficiency be assessed by the dilution method described by Kark and Lozner, the answer is "yes." Consequently, in view of the large and steadily increasing amount of work on vitamin K it is important that the methods of determining plasma prothrombin be reconsidered. Since there was a deficiency of several vitamins in all 22 cases investigated (4 by Kark and Lozner and 18 by the author), it is probable that the method of Kark and Lozner is superior to that in general use.—H. SCARBOROUGH. *Lancet*, 238 (1940), 1080. (W. H. H.)

Vitamin P. This discusses briefly the identification of vitamin P, another antihemorrhagic factor derived from fruit juices, particularly lemon and orange. It is different from vitamin K in not being fat-soluble, and its lack is associated with scurvy.—ANON. *Gaz. Farm.*, 8 (Mar. 1940), 20. (G. S. G.)

Vitamin P—Observations on. The usual methods of identifying the flavone (vitamin P) are not sufficiently sensitive and the reactions on which they are

based are too easily masked by substances accompanying the vitamin to permit their use for the detection of the flavone in foods or in organs.—IRINA ROBEZNIEKS. *Z. Vitaminforsch.*, 8 (1938), 27–31; through *Chimie & Industrie*, 41 (1939), 1149. (A. P.-C.)

ANALYTICAL CHEMISTRY

Adermine—Specific Color Reaction of. 2,6-Dimethyl-4-hydroxypyridine, 4-desoxyadermine and adermine can form cyanine dyes, provided their phenolic hydroxyl groups are esterified. The substance to be tested is treated with diazomethane to convert it into the *o*-methyl ester which, by treatment with methyl iodide, dimethyl sulfate or the methyl ester of *p*-toluenesulfonic acid, forms a quaternary pyridium compound. The iodomethylate of the methyl ester of 4-desoxyadermine and of the methyl ester of adermine crystallize easily. When heated for a short time in chloroform and potassium hydroxide solution in presence of alcohol, these compounds yield violet dyes of the carbopyridine-cyanine group. The formation of such a cyanine by the iodomethylate of the methyl ester of adermine is considered as a specific color reaction for vitamin B_6. The method can detect about 0.1 mg. of adermine hydrochloride.—R. KUHN and I. LÖW. *Ber. deut. chem. Ges.*, 72 (1939), 1453–1457; through *Chimie & Industrie*, 43 (1940), 321. (A. P.-C.)

Aliphatic Acids—Analysis of Mixtures of. The paper describes a method of analysis for the simultaneous qualitative and quantitative analysis of formic, acetic, propionic, isobutyric and *n*-butyric acids in complex acidic mixtures by azeotropic distillation with benzene and toluene.—S. T. SCHICKTANZ, W. I. STEELE and A. C. BLAISDELL. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 320–324. (E. G. V.)

Aliphatic Hydrocarbon Mixtures—Determination of Unsaturation in, by Bromine Absorption. A modified and time-saving bromide-bromate titration for the determination of unsaturates is described. Some sulfur compounds that affect the bromine number have been investigated and catalysts have been found which minimize the harmful effect of these sulfur compounds on the bromine number.—J. B. LEWIS and R. B. BRADSTREET. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 387–389. (E. G. V.)

Aluminum Sulfate—Methods for Determining Free Acid in. Twelve different methods were critically examined. The only satisfactory method was that of Craig (*Chem. Abstr.*, 5 (1911), 1720). Not more than 0.1 mg. of ferrous iron can be present and large quantities of ammonium or sodium salts affect the results.—T. EDER. *Z. anal. Chem.*, 119 (1940), 399–409. (S. W. G.)

***p*-Aminobenzenesulfonamide Tablets and Suppositories—Evaluation of.** Tablets and suppositories (ambesid, deseptyl, etc.) containing this agent can be evaluated in the known sulfatometric manner. The substance dissolved out with alcohol is identifiable by means of melting point or color reaction.—G. V. MIKO. *Pharm. Zentralhalle*, 80 (1939), 198–200; through *Chimie & Industrie*, 42 (1939), 1026. (A. P.-C.)

Ammonia—New Apparatus for the Determination of. A description.—ANON. *Wien. Pharm. Wochschr.*, 72 (1939), 348. (H. M. B.)

Antimony—Gravimetric Determination of, by Means of 8-Hydroxyquinoline. The reagent consists of an acetic acid solution of 8-hydroxyquinoline neutralized with ammonia. Precipitation is started in acid (hydrochloric) medium; the acidity is gradually neutralized by addition of ammonia. The precipitate contains 21.97% antimony and must be dried at 105° to 110° C. to constant weight.—T. I. PIRTEA. *Z. anal. Chem.*, 118 (1939), 26–30; through *Chimie & Industrie*, 43 (1940), 810. (A. P.-C.)

Arsenic and Phosphorus—Electrolytic Method for the Oxidation of, with a View to Their Determination in Organic Compounds. The compounds to be analyzed are first dissolved in 70% sulfuric acid. The oxidizing effect is due to the action of persulfuric acid and hydrogen peroxide which are formed during electrolysis. The arsenic and phosphoric acids are converted into their magnesium-ammonium salts and weighed as magnesium pyroarsenate and magnesium pyrophosphate.—C. BERGAMINI DI CAPUA. *Atti X Congr. Intern. Chimica, Roma*, 3 (1939), 401–406; through *Chimie & Industrie*, 43 (1940), 722. (A. P.-C.)

Arsenic—Colorimetric Microdetermination of. A new distillation procedure simplifies the determination of arsenic in biological materials.—A. L. CHANEY and H. J. MAGNUSON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 691–693. (E. G. V.)

Arsenic—Determination of, in Organic Arsenical Compounds. The following procedure is given: Accurately weigh 0.2–0.3 Gm. of the sample, transfer to a long-necked Kjeldahl flask, wash all particles down from the neck of the flask with water from a wash bottle and cautiously add 20 cc. of sulfuric acid. Heat over a Bunsen flame so that the mixture boils gently until white fumes appear, then place a small funnel in the mouth of the flask and boil gently without bumping. The length of time required for decomposition may vary from thirty minutes to about five hours depending upon the compound and should be continued until the liquid is completely decolorized. Allow the colorless or very pale yellow liquid to cool, add carefully with agitation 100–150 cc. of distilled water, transfer to a 400-cc. beaker, neutralize most of the acid with sodium hydroxide solution and complete the neutralization with a slight excess of potassium bicarbonate. Titrate the solution containing the arsenic trioxide with 0.1*N* iodine solution to a faint yellow color. 1 cc. of 0.1*N* iodine solution is equivalent to 0.00375 Gm. of arsenic. Results are given for sodium methylarsenate, atoxyl, stovarsol, stovarsol sodium, tryparsamide, novarsenobenzol, sulfarsenol and hectine.—R. TIOLLAIS and H. PERDREAU. *Bull. sci. pharmacol.*, 47 (1940), 58–64. (S. W. G.)

Arsenic—Determination of, in Potable Waters. A detailed description is given of the technique of the Gutzeit test as applied to potable water. The sensitiveness of the reaction is 0.001 mg. of arsenic and the limiting dilution is $1/_{500,000}$.—J. CSABAY and I. TANAY. *Magyar Gyógyszerésztud. Társaság Értesítője*, 15 (1939), 91–92; through *Chimie & Industrie* 43 (1940), 24. (A. P.-C.)

Arsenic—Microdetermination of. Description of a micromethod based on the reaction between arsine and silver nitrate solution: $AsH_3 + 6AgNO_3 + 3H_2O = H_3AsO_3 + 6Ag + 6HNO_3$. Using a Marsh apparatus the arsine is bubbled very slowly through a silver nitrate solution containing gum arabic which stabilizes the silver sol that is formed. The arsenic content is estimated by measuring the color of the solution in a Lovibond tintometer.—P. KAMERMAN. *J. S. African Chem. Inst.*, 22 (1939), 63–67; through *Chimie & Industrie*, 43 (1940), 458. (A. P.-C.)

Ascorbic Acid—Determination of, in the Presence of Tannin. The application of the volumetric method of Tillmann to the direct titration of vitamin C in fruits containing tannin gives high results. The error is less in the titration of fresh fruits than for dried fruits and is of the order of 10% to 30%. The difficulty may be overcome by precipitation of the tannin by lead acetate in a solution buffered at

p_H 3.8. The precipitation must be carried out fairly rapidly to reduce the loss of ascorbic acid by oxidation. Pure tannic acid has little effect on *p*-dichloroindophenol but the tannoids have a pronounced reducing action. In the direct titration of vitamin C in fruits, the procedure of Lanke eliminates the difficulty caused by the anthocyanin pigments present in the juice. The titration is carried out in the presence of a mixture of equal parts of toluene and *n*-amyl alcohol which is an excellent solvent for *p*-dichloroindophenol. In a few cases the pigments may dissolve in the organic layer also. In fruits, the precipitation of tannin is most effective if carried out before the addition of the buffer solution. The presence of oxidases in the fruit can also interfere in the titration. In order to properly estimate the difference in results obtained with and without precipitation of tannin, it is necessary to use the same extraction liquid. Determination of the end-point electrophotometrically eliminates any personal factor. Of the solvents studied, 5% trichloroacetic acid was the most satisfactory. Metaphosphoric acid (5% solution) is just as efficient if used hot and has the advantage of stabilizing the vitamin C but interferes in the precipitation of tannins with lead subacetate. In a direct titration, if tannins are present, one usually notices a fading of the end-point color, whereas if the color persists or even increases, one may suspect the presence of oxidases. The green pericarp of certain nuts is quite rich in vitamin C but unfortunately is not a suitable food. The various pharmaceutical extracts of *Jugulans regia* do not contain the ascorbic acid found in the fresh plant since the methods of extraction destroy the vitamin.—A. MIRIMANOFF and M. MORI. *Schweiz. Apoth.-Ztg.*, 78 (1940), 405, 685, 704. (M. F. W. D.)

Ascorbic Acid—Reducing Action of, on Mercuric Chloride. Addition of mercuric chloride solution to a solution of ascorbic acid immediately precipitates mercurous chloride, even when the ascorbic acid concentration is only 2 mg. per 100 cc. Data on the kinetics of the reaction in the dark at room temperature are tabulated. The reaction is of the third order and reaches completion in about 36 hours at room temperature.—R. INDOVINA and F. MANFROI. *Gazz. chim. ital.*, 69 (1939), 117–121; through *Chimie & Industrie*, 43 (1940), 52. (A. P.-C.)

***l*-Ascorbic Acid (Vitamin C)—Synthesis of.** *l*-Glucose is hydrogenated to *l*-sorbitol in presence of nickel catalyst at a pressure of 8 to 30 atmospheres. The *l*-sorbitol is converted into *l*-sorbose, which in turn is converted to diacetone-*l*-sorbose, which by permanganate oxidation in alkaline solution gives potassium diacetone-2-ketogulonate. Hydrochloric acid is added to liberate the free acid which is treated with alcoholic hydrochloric acid or with sulfuric or phosphoric acid to obtain *l*-ascorbic acid.—V. I. MAXIMOV, V. V. NIKONOVA, A. F. LAZAREV and L. A. ZVEREVA. *J. Obchtch. Khim.*, 9 (1939), 936–943; through *Chimie & Industrie*, 43 (1940), 232. (A. P.-C.)

Benzedrine (β-Phenylisopropylamine)—Detection and Determination of, and β-Phenylisopropylmethylamine. Benzedrine finds application in various medicinals and since it sometimes exerts a toxic action it is subject to regulation. Pervitine, which is the hydrochloride of a similar compound in which one hydrogen in the amino group is replaced by a methyl group has also been used medicinally. These compounds can be identified with the aid of Kofler's micromelting point and microsublimation apparatus. Both bases are volatile and can usually be converted to the picrolonate by moistening with sodium hydroxide and distilling into picrolonic acid. The melting point of the benzedrine derivative is 195–196° and that of the pervitine is 183°. Directions for carrying out the identification are given in detail.—G. DULTZ. *Z. anal. Chem.*, 120 (1940), 84–88. (S. W. G.)

Bismuth—Method for the Volumetric Determination of. Two new methods are described based on the precipitation of bismuth. In the compound $Bi(SCN)_6Cr$ the value of SCN resulting from hydrolysis is found by the iodometric method of Lang.—J. GONZALEZ CARRERO. *An. Real Soc. Espan. Fis Quim.*, 36 (1940), 33; through *Anales farm. bioquím. (Buenos Aires), Suplemento*, 11 (1940), 97. (G. S. G.)

Boron—Determination of, in Plant Material. The electrometric titration method has been adapted to the determination of boron in plant material. It is particularly suited to low concentrations found in boron deficiency studies, *e. g.*, in the range below 50 mg. of boron per Kg. of dry material.—L. V. WILCOX. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 341–343. (E. G. V.)

Carbon Monoxide—New Apparatus for Determining. A measured volume of the gas to be analyzed is passed through a U-tube containing iodine pentoxide heated to 125° to 150° C. and then through an absorption tube containing a solution of potassium iodite which absorbs the iodine liberated by carbon monoxide ($5CO + I_2O_5 = 5CO_2 + I_2$). The solution is then titrated with sodium thiosulfate.—C. TH. KAWASSIADOS. *Khemika Khronika (Compt. Rend. 1 er Congr. Chim. Hellènes)*, (1938), 245–246; through *Chimie & Industrie*, 43 (1940), 471. (A. P.-C.)

Cherry Juice—New Monograph for. The following statement for the limit of lead is recommended in the monograph: "Add 4 cc. of cherry juice to 10 cc. of nitric acid in a 250-cc. Erlenmeyer flask and boil for 5–10 minutes. Add 20 cc. of nitric acid solution and add 4-Gm. of citric acid. Cool in an ice bath and cautiously add 20 cc. of stronger ammonia water. Transfer to a separator, rinsing the flask with 5 cc. of distilled water. Adjust to room temperature and apply test for lead. Prepare a control standard using 20 cc. of the standard lead solution in place of the 20 cc. of nitric acid solution. The number of extractions shall not exceed those required for the control standard (lead, 5 parts per million)."—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 9 (1941), 156–157. (H. M. B.)

Chloride—Argentometric Determination of. To an aqueous solution which contains about 0.03 to 0.035 Gm. of chloride and is twice normal in nitric acid, add 5 cc. of carbon tetrachloride and 15 to 20 drops of a saturated solution of thionine picrate in methanol-acetone solution; add 1 drop of decinormal silver nitrate to give a blue color to the violet liquid and titrate with silver nitrate until the aqueous phase shows an ultramarine color. The carbon tetrachloride solution remains reddish violet. The method can also be used with smaller amounts as a semimicro method if a standard solution is used for the determination of the correct color.—E. PERCS. *Magyar Gyógyszerésztud. Társaság Értesitője*, 15 (1939), 426–427; through *Chimie & Industrie*, 43 (1940), 195. (A. P.-C.)

Chlorovinylarsine (Lewisite)—Method for Detecting. If a few drops of a 1% solution of osmium tetroxide are poured into the Draeger detector, after absorption of chlorovinylarsine, a black ring of osmium dioxide is formed. From 4 liters of air, 25 mg. of lewisite per cu. m. can be thus detected. The test is not affected by vapors of ethanol, ether, acetone or sulfur dioxide, provided not more than 4 mg. per cu. m. of the last is present. Acrolein would give a result similar to lewisite.—C. FROGER. *Compt. rend. acad. sci.*, 209 (1939), 351; through *Chimie & Industrie*, 43 (1940), 470. (A. P.-C.)

Cholesterol and Its Esters—Determination of. I. Some advantages in the use of trichloroethylene in place of chloroform in the Liebermann and Salkowsky reactions are pointed out. It is also used in place of chloroform in the colorimetric determination of cholesterol by Grigaut's method.—M. PAGET and G. PERRART. *Bull. soc. chim. biol.*, 21 (1939), 528–536; through *Chimie & Industrie*, 42 (1939), 1032–1033. (A. P.-C.)

Colorimetric Analysis of a Two-Component Color System. One method of resolution of a two-component color system using a photoelectric filter photometer depends on the ability to isolate part of the absorption band of the desired component by means of a suitable filter. The other method depends on the differential separation of the absorption bands by means of two appropriately selected filters. The details for calculating the concentration of one desired component in unknown mixtures with the second component are given.—H. W. KNUDSN, V. W. MELOCHE and C. JUDAY. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 715–718. (E. G. V.)

Compressi Laxantes Swiss Pharm. V—Study of, by Capillary Analysis. Compressi Laxantes of the Swiss Pharmacopœia V contain extracts of aloes and rhubarb, sodium bicarbonate and starch. The pharmacopœia indicates no method for determining the composition of the tablets. In the preliminary tests, mixtures of extract of aloes, sodium bicarbonate and starch, extract of rhubarb, sodium bicarbonate and starch and the formula of the pharmacopœia were compared with tablets bought on the market. The method was simply: the tablet or the prepared mixture in equivalent weight was shaken in a small tube with 10 cc. of solvent, the extract filtered if necessary and poured into a small beaker. A strip of special paper 30 cm. long and 2 cm. wide was suspended in it so that it just touched the bot- but did not touch the sides of the beaker. The adsorption was allowed to continue for 24 hours or until the solvent evaporated. The strips were observed in daylight and under ultraviolet light. The preliminary tests carried out with a variety of solvents indicated distinct differences between the prepared mixtures and the bought tablets. The second series of experiments indicated that the mode of extraction and small amounts of soap powder in the tablets accounted for the differences. The presence of extract of aloes was best shown in the ether and the isopropyl alcohol extracts. The isopropyl alcohol extract can be adapted to the approximation of the amount of extract of aloes present. For the detection of extract of rhubarb, alkaline petroleum ether and aqueous acid extractions were found most satisfactory. The appearance of a yellow color in the petroleum ether extract indicates the presence of aloes. It was found more satisfactory to test for aloes and rhubarb individually. The results are tabulated.—FRITZ WIESMANN. *Pharm. Acta Helv.*, 14 (1939), 131–141. (M. F. W. D.)

Copper—Colorimetric Determination of, with Triethanolamine. A spectrophotometric investigation of the colorimetric determination of copper with triethanolamine included a study of the effect of concentration of the reagent, and of ammonium, sodium and potassium salts on the transmission of copper-triethanolamine solutions; and a test of the conformity to Beer's law at several concentrations of triethanolamine. A comparative study of the ammonia method was also made. There is little difference in the sensitivities of the copper-ammonia and copper-triethanolamine methods, though the latter is more sensitive at low concentrations of copper.—J. H. YOE and C. J. BARTON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 456–459. (E. G. V.)

Copper—Determination of Traces of. A collaborative study was made of the previously described method (*J. Assoc. Official Agr. Chem.*, 22 (1940), 320) on samples containing 0.025 mg. of copper, both alone and in presence of 0.01 to 0.025 mg. each of cobalt and nickel and 0.01 to 0.10 mg. of bismuth. Cyanide separation proved entirely satisfactory for the elimination of bismuth interference, and hydrogen sulfide separation for elimination of interference with large proportions of cobalt and nickel. It was confirmed that contamination with small quantities of nickel and cobalt is of little moment. Photoelectric filter photometry gave better results than visual filter photometry.—DAVID L. DRABKIN. *J. Assoc. Official Agr. Chem.*, 23 (1940), 301–302. (A. P.-C.)

Copper in Mineral Oils—Determination of. The procedure developed employs dithizone for titrimetric extraction of the copper.—A. G. ASSAF and W. C. HOLLIBAUGH. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 695–697. (E. G. V.)

Corrosive Sublimate—Determination of, by the Amalgam Method. Corrosive sublimate can be determined volumetrically by the Volhard method after having been reduced by liquid zinc amalgam; this metal displaces mercury quantitatively from its salt to form an equivalent quantity of zinc chloride which can be titrated directly with silver nitrate.—V. D. PONOMAREV and D. S. KOLOTOV. *Zavodskaya Lab.*, 8 (1939), 672–673; through *Chimie & Industrie*, 43 (1940), 757. (A. P.-C.)

Cyclopropane—Determination of Unsaturates in. Some unsaturated hydrocarbons are to be expected in preparing cyclopropane since there is transition from a straight chain to a ring structure. Since there is evidence that presence of unsaturated compounds predisposes the patient to pulmonary edema, efficient purification methods are important. Cyclopropane is the least stable of cyclic hydrocarbons. Most likely unsaturated hydrocarbons are propene, or methylethene, the straight chain isomer of cyclopropane, propadiene C_3H_4, which contains two double bonds and propyne which is isomeric with propadiene. Some reactions typical of these compounds occur with cyclopropane. No specific reaction can be used for quantitative separation of cyclopropane and unsaturated hydrocarbons. The U. S. P. uses oxidation by permanganate. Report is made of experiments with modifications of the test. Details of these changes are given. No marked improvement in accuracy results but it standardizes the procedure at the point where the difficulty probably occurs.—FREDERICK K. BELL and JOHN C. KRANTZ, JR. *Jour. A. Ph. A.*, 30 (1941), 50. (Z. M. C.)

Depilatories—Determination of Sulfides in. On the basis of analytical data presented, a modification (technique described in detail) of Mohr's arsenious acid method for the determination of hydrogen sulfide is tentatively proposed for the determination of sulfides or hydrosulfides of sodium barium, strontium, calcium, potassium, ammonium and lithium in liquid, powder and paste depilatories. A supplementary method is described, which is applicable in the presence of carbonates; it provides for the escape of carbon dioxide liberated by the action of the acid, without permitting of loss of hydrogen sulfide.—EDWARD M. HOSHALL. *J. Assoc. Official Agr. Chem.*, 23 (1940), 437–444. (A. P.-C.)

Deuterioethyl Ether—Determination of. Widmark's principle of oxidation with dichromate in concentrated sulfuric acid is used. According to the equation: $3C_2D_5OC_2D_5 + 4Cr_2O_7 + 32H^+ \rightarrow 6CD_3COOD + 8Cr^{+++} + 3D_2O + 16H_2O$, 0.01 cc. of hundredth-normal sodium thiosulfate should correspond to 1.053 Gm. deuterioethyl ether. De-

terminations were carried out in water and in blood. It was found that in aqueous solutions the factor was 1.10 ± 0.004 and in blood 1.07 ± 0.003.—K. HANSEN and O. DYBING. *Biochem. Z.*, 301 (1939), 225–228; through *Chimie & Industrie*, 43 (1940), 109. (A. P.-C.)

2,6 - Dichlorobenzenoneindophenol Solutions—Stable. Standardized solutions of the indicator have widespread use in the determination of vitamin C in biological materials. A stable solution may be prepared as follows: Distil 500 cc. of dioxane, discarding the first 50 cc and the last 50 cc. Weigh out sufficient sodium 2,6-dichlorobenzenoneindophenol to give a final solution slightly stronger than needed (usually about 0.2 Gm. per 100 cc. for 0.005*M*, but the assay of different batches of the dry indicator varies). This permits dilutions to exact strength if desired. Stir the indicator into the dioxane and add 1 cc. of glacial acetic acid for every 100 cc. of solution. Stir thoroughly for about 15 minutes, breaking up any lumps with a stirring rod. Filter through a dry No. 42 Whatman filter paper and standardize the clear red filtrate. Standardize against pure ascorbic acid in the usual manner, keeping the volume of added dioxane below about 10% of the total volume.—I. STONE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 415. (E. G. V.)

Elements—Identification of, in Organic Materials. For the detection of bromine and chlorine, a small amount of the material in a microbeaker is treated with a few drops of a saturated solution of potassium permanganate and 1 cc. concentrated sulfuric acid. A piece of fluorescein paper across the mouth of the beaker is turned red (eosin) in the presence of bromine or bleached by chlorine or large amounts of bromine. If the compound contains chlorine it can be shown by covering the beaker with a slide carrying a drop of 1% solution of 1,2,5-toluenediamine in dilute sulfuric acid. Needles form singly and in aggregates. Bromine gives no reaction under these conditions. All bromine compounds except tertiary butylbromide and chlorine compounds except carbon tetrachloride, *p*-chlorophenol, chloro-*m*-cresol and chlorobenzoic acid gave the test. The detection of sulfur by the generation of hydrogen from zinc and hydrochloric acid acting on the organic compound is not reliable when the gases are tested on lead acetate paper. The testing of organic compounds for carbon by the charring produced with concentrated sulfuric acid is negative for urea, thiourea, cyanuric acid, dimethylglyoxime, diphenylurea, benzene, benzenesulfuric acid, phenol, salicyclic acid, sulfosalicyclic acid, *p*-hydroxybenzoic acid, anisic acid, coumarin, *o*-phthalic acid anhydride, *o*-hydroxyquinoline and acridine.—L. ROSENTHALER. *Pharm. Acta Helv.*, 14 (1939), 215–216. (M. F. W. D.)

Ferricyanides—Method of Detecting. Microchemical methods are useful only when small amounts of a substance are obtainable. The method is also of use in detecting ferricyanide in the presence of ferrocyanide. Formerly this was done using benzidine to fix the lead salt of the ferrocyanide. A simple microtechnique is described which uses trisulfuric copper chloride in place of benzidine.—ERNESTO STORFER. *An. Univ. Santo Domingo*, 3 (1939), 359. (G. S. G.)

Ferrocyanide Ion—Qualitative Identification of. Place one drop of the solution to be tested on a white spot plate. Acidify slightly with dilute hydrochloric acid and add 1 drop of titanium tetrachloride reagent (add 10 cc. of liquid titanium tetrachloride to 90 cc. of 1 to 1 hydrochloric acid). A slow-forming yellowish or reddish brown precipitate indicates the presence of ferrocyanide ions. Nitrite, arsenate, chromate and other strongly oxidizing ions interfere. The limit of sensitivity is about 0.05 mg. of ferrocyanide ion.—W. C. OELKE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 498. (E. G. V.)

Filter Media. Among the outstanding new filter clothes are those made of glass, rubber, wire and resins.—F. J. VAN ANTWERPEN. *Ind. Eng. Chem.*, 32 (1940), 1580–1584. (E. G. V.)

Fluorine—Amperometric Determination of, with Thorium Nitrate. Using 0.01*N* thorium nitrate and the dropping mercury electrode for the end-point determination, up to 0.2 mg. of fluorine can be titrated with a precision of 1.0% in 50 cc. of 0.1*N* potassium chloride or potassium nitrate solution as conducting salt. In smaller volume, quantities as small as 0.005 mg. of fluorine can be titrated with 0.001*N* thorium nitrate solution. Similar results are obtainable with lanthanum nitrate. The interfering effect of temperature, alcohol and some impurities was studied.—A. LANGER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 511–514. (E. G. V.)

Fluorine—Microestimation of, in Blood. Improvements in Kraft's method (*Z. Physiol. Chem.*, 246 (1937), 248–257). Ashing the serum in a stream of oxygen is recommended. A second and third distillation of the hydrofluosilicic acid are necessary if more than 0.02 mg. of fluorine is present. Six samples of horse blood contained 0.049–0.070 mg. of fluorine per 100 cc.; 70 samples of human blood contained 0.035–0.145 mg.—BERTHA WULLE. *Hoppe-Seyler's Z. Physiol. Chem.*, 260 (1939), 169–174; through *Chimie & Industrie*, 43 (1940), 111. (A. P.-C.)

Heavy Metals Tests—Revised. Procedures for N. F. VII for conducting the heavy metals tests for 36 chemicals are offered.—EMERSON C. BEELER. *Bull. Natl. Formulary Committee*, 9 (1941), 166–172. (H. M. B.)

Hydrogenation. A series of papers on catalyst, applications, economic aspects, etc.—*Ind. Eng. Chem.*, 32 (1940), 1189–1216. (E. G. V.)

3-Indoleacetic Acid—Detection of Traces of, in the Presence of Tryptophan. When a very dilute solution of tryptophan is boiled with concentrated hydrochloric acid containing ferric chloride a red-brown pigment is formed which is extracted by butyl alcohol. Indoleacetic acid in higher dilution gives the same reaction. A reagent prepared by adding not more than 0.01 cc. of concentrated ferric chloride solution (specific gravity 1.453) to 100 cc. of concentrated hydrochloric acid gives a scarcely visible yellow color with a 1:2000 solution of tryptophan but gives a strong pinkish yellow with a 1:1,000,000 solution of indoleacetic acid.—A. BERTHELOT, GERMAINE AMOUREUX and SUZANNE DEBERQUE. *Compt. rend. soc. biol.*, 131 (1939), 981–983; through *Chimie & Industrie*, 42 (1939), 967. (A. P.-C.)

Iodine—New Oxidation Reduction Reaction Catalyzed by. When a nitrite is added to a dilute nitric acid solution containing lead arsenite, a precipitate of lead arsenate is obtained if the iodide ion is present, but no precipitate is obtained if iodides are absent. With this reaction as its basis, as little as 0.2γ of iodide can be detected.—D. HART and R. MEIROWITZ. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 774–775. (E. G. V.)

Iron—Colorimetric Determination of, with Salicylaldoxime. A spectrophotometric study of the complex formed by the action of ferric ion on salicylaldoxime has indicated that this complex might be used for the colorimetric determination of ferric ion. The complex is most suitably used for this purpose in a neutral solution, p_H being the critical factor in the determination. The range of concentrations is from 0.05 to 10 parts per million of iron with the limits being extended each way by proper dilution or concentration. Interfering substances are easily removed, the reagent is highly specific

and no special techniques are necessary.—D. E. HOWE and M. G. MELLON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 448–450. (E. G. V.)

Iron—Determination of Small Quantities of, in Boric Acid and Borax by Means of Sulfosalicylic Acid. Dissolve 0.5 to 1 Gm. of boric acid in 8 cc. of water (in the case of borax use 2% sulfuric acid); dilute to 10 cc., add 5 cc. of 10% solution of sulfosalicylic acid and 5 cc. of 10% ammonia colored with α-naphtholphthalein and compare the color produced with those of a series of standard solutions containing 0.0025 to 0.015 mg. of iron, treated in the same way.—I. I. ZOUSSER. *Zavodskaya Lab.*, 8 (1939), 1182–1183; through *Chimie & Industrie*, 43 (1940), 757. (A. P.-C.)

Iron in Liquid Food Products—Determination of. This method differs from the Stugart procedure in that a sample of approximately 10 Gm. is employed; a wet-ashing procedure which is more rapid than dry-ashing is used; the procedure for hydrolysis of pyrophosphates is eliminated.—H. L. ROBERTS, C. L. BEARDSLEY and L. V. Taylor. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 365. (E. G. V.)

Lead—Determination of Small Quantities of, with Dithizone. A review of the literature on the determination of small quantities of lead with dithizone has shown that there is a lack of clarity with respect to certain steps in the procedure. A new, improved procedure is given for the colorimetric determination of lead which is based on previous and recent experiments. A simple procedure for titrating the colored solution is also given. A particular study was made of the effect of p_H with respect to the complete extraction of the lead dithizonate. A good extraction can be made in alkaline potassium cyanide solutions so that separations and determinations of lead can be made in the presence of large amounts of a metal like zinc. Traces of copper may catalyze the oxidation of dithizone by certain substances but such an effect can be prevented by adding hydroxylamine hydrochloride and boiling the solution. Since it is possible to extract the lead from solutions containing potassium cyanide, the sensitivity of the test for lead in the presence of bismuth or divalent tin can be increased greatly; as little as 0.5 microgram of lead can be detected in the presence of 1 mg. of bismuth or 2.5 mg. of stannous tin. At p_H 9, 0.5 microgram can be detected in the presence of 12 mg. of monovalent thallium. For the detection of lead in the presence of considerable bismuth it is recommended to extract the lead first at p_H 3, when most of the bismuth is removed and then extract again in strong potassium cyanide solution. In the separation of lead from thallium in the presence of potassium cyanide advantage is taken of the fact that the lead dithizonate is formed before the analogous thallous compound.—H. FISCHER and G. LEOPOLDI. *Z. anal. Chem.*, 119 (1940), 161–188. (S. W. G.)

Mercury—Determination of Small Quantities of, in Organic Compounds by Means of Potassium Iodide. The method is based on the titration of the mercury-containing solution by means of potassium iodide solution in presence of iodine and starch. The organic matter is destroyed by treating with fuming sulfuric acid, to which fuming nitric acid is added drop by drop through the condenser.—N. V. KOCHKINE. *Zavodskaya Lab.*, 8 (1939), 677–679; through *Chimie & Industrie*, 43 (1940), 641. (A. P.-C.)

Mercury—Microdetermination of, in Organic Liquids and Tissues. Organic matter is destroyed by wet combustion with sulfuric and nitric acids and potassium permanganate. Mercury is precipitated with hydrogen sulfide and entrained with barium sulfate. After filtration the mercury is dissolved in nitric acid, extracted with a carbon tetrachloride solution of dithizone, and determined colorimetrically by comparison with a standard solution. The sensitiveness is 0.005 mg. of mercury.—A. J. LLACER. *Anales assoc. quím. argentina*, 27 (1939), 49–63; through *Chimie & Industrie*, 43 (1940), 198. (A. P.-C.)

Methanol—Qualitative Detection of. The U. S. P. test for methanol in whisky was found to give a positive test with ethanol even though no methanol is present. Chromotropic acid is specific, detecting as little as 0.016 mg. of methanol. It is easily carried out and may be applied to as little as 0.02 cc. of a 1:1000 solution of methanol. Neither ethanol nor whisky interferes.—WALTER C. GAKENHEIMER and WALTER H. HARTUNG. *Jour. A. Ph. A.*, 30 (1941), 49. (Z. M. C.)

Micro-Carius Halogen and Sulfur Determination. Through suitable combination of a number of favorable factors it was possible to unify, standardize and improve the prevalent micro-Carius methods for halogen and sulfur to such an extent that one apparatus and one method of digestion, as well as an identical filtration procedure, can now be applied to the determination of elements. Some of the difficulties inherent in the micro-Carius method have been partially or totally remedied.—J. B. NIEDERL, H. BAUM, J. S. McCOY and J. A. KUCK. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940). (E. G. V.)

Microgram and Millimicrogram. The Committee on Nomenclature, Spelling and Pronunciation of the American Chemical Society has approved the following recommendation of the Division of Microchemistry: For 0.001 milligram the term "microgram," designated by the symbol γ (the word "gamma" should not be used as a substitute for "microgram"). For 0.001 microgram, the term "millimicrogram," designated by the symbol mγ (the term "milligamma" should not be used).—ANON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 359. (E. G. V.)

Mustard Gas—Detection of, in Drinking Water and Milk. The sample is shaken with norite type of activated charcoal, which is filtered off and dried. Mustard gas is then detected in the charcoal by means of known tests, such as the silver coin or Obermiller's gold chloride reactions.—A. TASMAN. *Chem. Weekblad*, 36 (1939), 786; through *Chimie & Industrie*, 43 (1940), 387. (A. P.-C.)

Nickel—Detection of, by Means of a Fractional Flotation Reaction. The reaction of nickel with dimethylglyoxime is more delicate and more specific if the precipitate is floated by means of an organic liquid such as carbon tetrachloride. Under these conditions the presence of sodium, potassium, ammonium, magnesium, calcium, strontium, barium and phosphates does not interfere.—I. M. KORENMANN and V. V. DOUDNIK. *J. Prikl. Khim.*, 12 (1939), 1742–1743; through *Chimie & Industrie*, 43 (1940), 810. (A. P.-C.)

Nickel, Zinc, Lead and Mercury—Determination of Very Small Quantities of, by Microelectrolysis and Spectrography. The proposed method, which is described in detail, consists in precipitating the metal on the cross section of a copper wire or upon a graphite pencil, while, at the same time, a known quantity of the element in question is deposited under the same conditions on another electrode. Then the electrode containing the known quantity is examined with the spectroscope and the spectrogram is compared with that of the unknown quantity of metal. The method gives good results with zinc and nickel, less satisfactory results with lead and unsatisfactory results with mercury.—C. SANNIÉ and V. POREMSKI. *Bull. soc. chim.*, 6 (1939), 1401–1411; through *Chimie & Industrie*, 43 (1940), 13. (A. P.-C.)

***p*-Nitroaniline—Colorimetric Determination of Small Quantities of, in Air.** Pass the air to be

analyzed 6 times through a dry 10- or 20-liter bottle, introduce 20 cc. of 1% sulfuric acid and let stand for several hours, shaking occasionally. Pour 30 cc. of the solution in a 50-cc. volumetric flask, cool in ice and add 1 to 3 drops of 10% sodium nitrite solution. After standing for 15 minutes in ice, add 6 cc. of a mixture of 10% sodium carbonate solution (6 cc.) and of alcoholic β-naphthol solution (3 drops), make to volume and compare colorimetrically after 15 to 20 minutes. The amount of *p*-nitroaniline present in the sample should not exceed 0.06 mg.—B. V. PONOMARENKO. *Zavodskaya Lab.*, 8 (1939), 996; through *Chimie & Industrie*, 43 (1940), 653. (A. P.-C.)

Nitrogen Bases and Alkaloids—Organic, Detection and Determination of, by Means of Reinecke's Salt. Reinecke's salt, $NH_4[Cr(NH_3)_2(SCHN)_4]\cdot H_2O$, forms precipitates with organic bases and alkaloids. With some, immediate precipitation results, with others there is slow precipitation, and with still others there is not precipitation at all. In some cases it is better than any other reagent. Numerous experiments were carried out with various bases. The composition of the salts and the best conditions for carrying out a gravimetric analysis are given. The reagent is useful for detecting and determining alkaloids such as cocaine, benzoylecgonine and ecgonine in viscera.—P. DUQUENOIS and MELLE. FALLER. *Bull. soc. chim.*, 6 (1939), 998–1008; through *Chimie & Industrie*, 43 (1940), 145. (A. P.-C.)

Nitrogen—Simple and Sensitive Test for, in Organic Products. The following test will detect less than 0.005 mg. of nitrogen in organic material: place a few mg. of the sample in a small ignition tube not over 5 mm. in diameter, cover with a layer of quicklime 5 mm. deep, mix and add a little copper powder if nitro or azo compounds are present; heat over the flame and test the escaping gas with a drop of 6 times normal hydrochloric acid held in a loop of platinum wire at the mouth of the tube or with paper which has been moistened with hydrochloric acid; place the water, or the filter paper, after the heating on a spot plate containing a drop of Riegler's reagent; a distinct red color develops if nitrogen is present. To prepare Riegler's reagent dissolve 1 Gm. of *p*-nitroaniline in 20 cc. of water and 2 cc. of hydrochloric acid with heating; after cooling add 20 cc. of 2.5% sodium nitrite solution, shake until solution is complete and filter if the reagent becomes turbid.—A. G. EPPRECHT and B. HORNUNG. *Helv. Chim. Acta*, 22 (1939), 925–927; through *Chimie & Industrie*, 43 (1940), 109. (A. P.-C.)

Optical Crystals—Synthetic. Present day advances in ultraviolet and Infra-red spectroscopy have brought about the need for more and larger optical crystalline materials than are found in nature. Lithium fluoride crystals up to 8 pounds in weight are grown. Optically similar to fluorite, lithium fluoride can effectively replace this limited natural supply. Sodium chloride crystals, up to 25 pounds in weight and superior to natural rock salt, are grown. Potassium bromide and potassium iodide crystals for far-Infra-red transmission are also grown. Natural calcite of optical quality is scarce, and the increasing demand for polarizing optics has stimulated the development of producing large single crystals of sodium nitrate. All of these optical crystals are grown from their molten salts under carefully controlled gradient and temperature. A 25-pound crystal requires some 10 days to grow and at least that long to anneal.—H. C. KREMERS. *Ind. Eng. Chem.*, 32 (1940), 1478–1483. (E. G. V.)

Organic Compounds—Contribution to the Detection of. The difference between methanol and ethanol may be determined with concentrated nitric acid. The blue color given by glycerin with potassium dichromate and nitric acid is not specific. Various phenols can be identified by the color of the melt or the alkaline solution obtained from the reaction product of *o*-sulfobenzoic acid anhydride and the phenol. The detection of hydrocyanic acid can be made by adding the HCN to a neutral solution of mercuric chloride in the presence of the proper hydrogen ion indicator. The test is sensitive to 1 part HCN per million under the proper conditions. The conversion of hydrocyanic acid to nitroprusside is not so sensitive. Theophylline may be detected by observing the crystals formed in aqueous ammonia solution when a crystal of solid thallium acetate is added. Various compounds as ascorbic acid, dihydroxymaleic acid, pyrocatechol and other materials containing two hydroxyls ortho to each other give a blue color on treatment with aqueous potassium carbonate and ferrous sulfate. Ferric iron may be used to detect the reducing action of organic compounds. The material to be tested is heated with a solution of ferric sulfate in a water bath for 5 minutes, cooled, treated with phosphoric acid and the presence of Fe^{++} determined with alcoholic dimethylglyoxime and ammonia.—L. ROSENTHALER. *Pharm. Acta Helv.*, 14 (1939), 218–221. (M. F. W. D.)

Organic Substances—New Micromethod for the Determination of Certain. Fresh solutions of hypoiodous acid, prepared by the action of sodium hydroxide on iodine, act as oxidizing agent toward certain organic substances such as coffee constituents (chlorogenic acid, trigonelline), constituents of ophidic venoms (amino acids), etc. An excess of hypoiodous acid is added to the solution under examination, the excess is titrated with sodium thiosulfate.—K. NEISER and L. MANGINELLI. *Rev. brasil. chim.*, 8 (1939), 23–25; through *Chimie & Industrie*, 43 (1940), 108. (A. P.-C.)

Oxygen in Organic Compounds—Qualitative Test for. One Gm. of ferric chloride and 1 Gm. of potassium thiocyanate are dissolved separately in 100 cc. of methanol and the solutions are mixed and filtered to remove the precipitated potassium chloride. Filter paper is drenched with the resulting solution and air-dried. More than one dipping may be necessary to produce a product having a greenish reflex resembling fuchsin crystals. The paper is then cut into small squares (5 mm.) and preserved in a well-stoppered container protected from sunlight. Under such conditions the test paper may be preserved for months. In carrying out the test a small square of the ferrox paper is stirred with a few drops of the liquid to be tested. Solids are tested as saturated solutions in hydrocarbons (or halogenated derivatives) in which appreciable solubility is observed. (Caution: Commercial chloroform contains alcohol as a preservative.) A positive test is evidenced by a deep wine-colored solution; hence traces of oxygen compounds in hydrocarbons may be detected. Mineral acids and hydrogen peroxide bleach ferrox paper.—D. DAVIDSON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 40–41. (E. G. V.)

Pentamethylene-Tetrazol Products—Assay of. An aqueous solution of pentamethylene-tetrazol gives with a saturated aqueous solution of mercuric chloride a crystalline precipitate of a double salt that melts at 176° C., is difficultly soluble in cold water and separates on heating the solution. It can be assayed by iodometric determination of its mercury content (48.6%).—F. V. MIKO. *Pharm. Acta Helv.*, 14 (1939), 31–34; through *Chimie & Industrie*, 42 (1939), 1026. (A. P.-C.)