VOL. VII, No. 1 JANUARY 1941

PHARMACEUTICAL ABSTRACTS

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

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

ABSTRACTORS

CONTENTS

BACTERIOLOGY (*Continued*)

B. Typhosus—Dark Field Study of H and O Agglutination of. Using the sun in South Africa as the source of illumination for dark field studies on the motility of *B. typhosus*, the author concluded that the organisms move by means of two thread-like "tails" which are attached at the middle of the cell. When in motion the two tails become twisted together and the organism propels itself by lashing about this single tail in various directions. The classical conception of the typhoid organism as having peritrichous flagella spread over the entire cell body is explained by the author as simply an artifact which results when the organisms are dried on a glass slide. In flagellar (H) agglutination, the tails of the organisms become covered with a granular deposit which stiffens them and they become entangled with each other. In somatic (O) agglutination the bacilli exert a real mutual attraction for each other and they join in an end-to-end direction. This leads to the building up of clumps which exhibit a regular pattern.—A. PIJPER. *J. Path. Bact.*, 47 (1938), 1. (T. C. G.)

Bacteriophage—Test of One Theory of Origin of. One of the theories of the origin of bacteriophage is that it is produced as the result of the interaction of the host tissues and the infecting bacteria. To test this theory sterile house flies (*Musca domestica* L.) were infected with a non-lysogenic but lytically susceptible strain of staphylococcus (*Staphylococcus musca*). The flies were ground in broth which was then tested for the presence of bacteriophage. In no instance was bacteriophage detected, thus failing to support one theory of the origin of bacteriophage.—R. W. GLASER. *Am. J. Hyg.*, 27 (1938), 311. (T. C. G.)

BCG Vaccination—Results of. Tuberculosis is relatively common in El Golea, but in the 104 cases seen by the author it is comparatively chronic. Arabs are the chief sufferers, but although there are few negro cases they tend to be more acute. In 1933, 133 infants were vaccinated with BCG, and a year later were revaccinated. Of these 103 have been traced and tested with tuberculin more than 5 years after the first vaccination. In all, 35 were found to be positive, and comparing these results with the tests performed before vaccination, 21 have become allergic, 14 have remained allergic, 8 have lost their allergy and 60 have remained anergic. Of these vaccinated persons the majority are in good health. Five live in tuberculous households and one of these is probably tuberculous, but may have been so before vaccination. Nine others live in households where tuberculosis is suspected, but all are healthy. The author considers it probable that the vaccination has afforded protection and advises an extension of the BCG program without previous skin tests, as practiced by Foley and Parrot.—R. GILLET. *Arch. Inst. Pasteur d'Algerie*, 17 (1939), 502; through *Bull. Hyg.*, 15 (1940), 220. (T. C. G.)

Blood Cultures—Use of Saponin in. Citrated blood from patients is added to nutrient broth containing 0.033% saponin. The cultures are incubated aerobically and daily transplants made to horse blood agar for identification of the organisms isolated. The value of using saponin in the blood cultures was shown in the following study. Blood specimens from 65 patients were innoculated in duplicate into the saponin broth and control broth cultures without saponin. Ninety-seven per cent of the saponin cultures showed growth while only 71% of the control tubes showed growth. Experiments designed to determine why the saponin cultures gave better results suggested that when the saponin lyses the cellular elements of the blood, growth-promoting substances are thereby liberated. *Streptococcus viridans*, *Diplococcus pneumoniae*, and *Escherichia coli* showed more rapid and profuse growth when saponin was added to the blood cultures. The growth of *Streptococcus pyogenes*, *Streptococcus fecalis* or *Staphylococcus aureus* was not accelerated by the addition of saponin.—S. D. ELLIOTT. *J. Path. Bact.*, 46 (1938), 121. (T. C. G.)

Blood Cultures—Use of Sodium Polyanethol Sulfonate for. The addition of 0.05% sodium polyanethol sulfonate ("Liquoid") to whole blood specimens from patients produces an excellent blood culture medium for most pathogenic organisms. The Liquoid is prepared as a 5% solution in saline, autoclaved ten minutes at 115° C. and added aseptically to the blood specimen. Liquoid acts as an anticoagulant and neutralizes the inhibitory action of the complement and *beta* lysins in the blood.—T. VAN HAEBLER and A. A. MILES. *J. Path. Bact.*, 46 (1938), 245. (T. C. G.)

Cobra Venom—Studies on the Hemolysin of. The effects of p_H, addition of proteins, lipoids and salts, on the hemolysin of RBC of guinea pigs by cobra venom is reported. The maximum hemolytic activity was observed at p_H 7.6 and the minimum at p_H 5.6. Heating to 60° for one hour did not decrease hemolytic activity but higher temperatures did. Purification of the hemolysin rendered it more sensitive to heat. Normal sera of the horse, sheep, rabbit and guinea pig inhibited the hemolysis of RBC of rabbits and guinea pigs by the venom. Inactivated horse serum accelerates this hemolysis. Lipoids from sheep serum, casein and cholesterol inhibited the hemolytic acitivity of cobra venom on RBC of the guinea pig, as did the chlorides of lead, barium and mercury. Under the same conditions, hemolysis was accelerated by egg albumin, lecithin and the lipoids from the sera of guinea pigs and rabbits. As to whether $CaCl_2$ solution accelerates or inhibits hemolysis, depends on its concentration. Addition of glycine increased the hemolytic activity of the purified hemolysin. Work in this field is reviewed.—S. S. DE. *Indian J. Med. Research*, 27 (1940), 793–796. (W. T. S.)

Complement—Preservation of, for Wassermann Test. The following method of preserving complement is said to maintain its original potency for twelve months. Fresh complement is obtained by severing the neck vessels of several guinea pigs and collecting the blood. This is left over night at 0° C. and the serum separated. To a given volume of serum is added an equal volume of the following mixture: sodium acetate, 12 Gm.; boric acid, 4 Gm., and sterile distilled water, 100 cc. This mixture is stored at 4° C.—C. A. GREEN. *J. Path. Bact.*, 46 (1938), 382. (T. C. G.)

Diphtheria—Manzullo Immediate Tellurite Test for. From the results being recorded by investigators in various parts of the world of their findings with Manzullo tellurite test it ought to be possible soon to gage its true value in the diagnosis of diphtheria. The author analyzes the results of the test in 62 patients with pharyngeal exudate in Johannesburg. Thirty-eight gave positive direct tellurite tests, but 11 of these were neither clinically nor bacteriologically cases of diphtheria; on the other hand five of the 24 giving a negative reaction were, both on clinical and bacteriological grounds, cases of diphtheria. Judging from these results the Manzullo test would mislead as a quick diagnostic method in a considerable number of cases. The suggestion has been put forward that the type of organism may play a part. Thus Tombleson and Campbell found "a slightly higher proportion of negative reactions" in *gravis* strains, whereas Wood-

cock thinks the type has no relationship to the proportion of positive reactions. In the Witwatersrand area, according to the authors, *mitis* strains constitute 90% or over of those isolated, the remainder being *gravis;* Tomlin's series were 93% *gravis*, and Woodcock's 54%. It would seem therefore, that the type has no specific effect. So far as 62 cases can be used as a percentage basis the author states that of these 84.3% of diphtheria cases and 36.6% of non-diphtheritic cases gave positive results.—J. F. MURRAY. *S. African Med. J.*, 13 (1939), 787; through *Bull. Hyg.*, 15 (1940), 212. (T. C. G.)

Diphtheria Prophylaxis. A Review of Antigens and Methods. The author's object in this and his preceding papers has been to collect and assess the data which would indicate the most reliable and convenient prophylactic to be recommended for use in mass immunization. He has already reported a Schick conversion rate of 98.8% in 2163 Schick-positive children receiving three doses of 1.0 cc. of T.A.M. at fortnightly intervals. The results now given comprise those given by two injections of alum-precipitated toxoid, the dosage in the earlier series consisting of 0.1 cc. followed by 0.5 cc. after two weeks; replaced later by 0.25 cc. and 0.5 cc. with a four-week interval. Schick tests were done after 2–3 months. Of 760 children originally Schick positive, 99.2% became negative, and of the 279 not previously tested 98.8% were negative after the injections so that 99.1% of the total had been satisfactorily immunized. Of 1082 children receiving A.P.T. 35 had mild reactions and 8 severe reactions, practically all after the first dose and mostly in children over 8 years of age. From his own results and his review of the literature the author concludes that, while any of the usual prophylactics can be made to give good results if satisfactorily controlled, two doses of A.P.T. give a consistently high Schick negative rate and need cause few reactions in the first dose of 0.5 cc. in children under 8 and 0.25 cc. in those over that age.—J. T. LEWIS. *Med. Officer*, 62 (1939), 235; through *Bull. Hyg.*, 15 (1940), 211. (T. C. G.)

Diphtheria—Rapid Diagnosis of. The authors have compared the results of examination of 500 consecutive cases of pharyngeal exudate by Manzullo tellurite method and by growth on Loeffler's medium. Of the 500, there was a total of 244 positive bacteriologically. Eighty-five were positive to both (34.8%), 214 (87.7%) were positive to Loeffler, and 115 (47.1%) to Manzullo test. Of 30 positive to Manzullo, nine were not diphtheritic. The latter, therefore, was only a limited value; it does, however, give a higher proportion of positives than does the direct examination, 31.2% and 26.6%, respectively, but Loeffler's serum gave as many as 54.4%.—B. R. PESTANA and M. F. Q. FERREIRA. *Ann. Paulist. Med. Cirurg.*, 38 (1939), 393; through *Bull. Hyg.*, 15 (1940), 212. (T. C. G.)

Diphtheria—Swab Culture Diagnosis of. The results are given of two years' experience of the swab culture method associated with the names of Sole, Folger and Brahdy. Swabs are dipped in horse or ox serum and slightly heated, or, as in the present series, soaked in a special medium of Pergola. Growth of the diphtheria bacilli is said to be detectable microscopically after 4–10 hours in the incubator. The figures consist of the results of swab cultures from various sources in diphtheria, scarlet fever and measles cases on admission and discharge from the hospital. Although it is not compared with the classical method of diagnosis, this rapid and economical technique appears to give satisfactory results.—A. MAGGIO. *Boll. sez. ital. soc. intern. microbiol.*, 11 (1939), 139; through *Bull. Hyg.*, 15 (1940), 212. (T. C. G.)

Disinfecting and Sterilizing the Hands, Medical Appliances, Etc.—Compositions Suitable for. A higher molecular sulfonium compound such as dodecylbenzylmethyl- or 2,6-dichlorobenzyldecylmethyl-sulfonium methylsulfate is used, suitably in dilute solutions.—WILHELM NEUGEBAUER, assignor to ALBA PHARMACEUTICAL CO. U. S. pat. 2,155,504, April 25, 1939. (A. P.-C.)

N^1-Dodecanoylsulfanilamide. I. Experimental Infections with Beta Hemolytic Streptococci. The drug, when administered in oil to mice, shows marked therapeutic efficacy against *beta*-hemolytic streptococci. This effect is lost when an aqueous medium is used.—DAVID R. CLIMEKO and R. L. SCHMIDT. *Proc. Soc. Exptl. Biol. Med.*, 43 (1940), 622. (A. E. M.)

N^1-Dodecanoylsulfanilamide. II. Experimental Infections with Mycobacterium Tuberculosis. The drug inhibits the growth of tubercle bacilli *in vitro* at a concentration of 10 mg. per 100 cc. in beef infusion-dextrose-glycerol media over a period of 90 days. It also inhibits the development of the tuberculous process in guinea pigs infected subcutaneously with a human strain of tubercle bacilli.—DAVID CLIMENKO. *Proc. Soc. Exptl. Biol. Med.*, 43 (1940), 624. (A. E. M.)

Methylene Blue—Action of, on Mycobacterium Lepræ Muris. Reports conflict concerning the direct action of methylene blue on the human lepra bacilli but it is clinically useful in the disease. The bacilli of rat leprosy is reported to be stained but not attenuated by the dye. Methylene blue has now been shown to neither stain nor attenuate *Mycobacterium lepræ muris in vitro. In vivo*, it had no degenerating action on the same organism contrary to previous reports.—DHARMENDRA and N. N. MUKHERJI. *Indian J. Med. Research*, 27 (1940), 627–630. (W. T. S.)

Milk Counts. Results of a Coöperative Study with a New Medium. A new medium for making plate counts of milk has been recently recommended by the American Public Health Association. The ingredients of this medium are as follows: Agar, 1.5%; beef extract, 0.3%; peptone (beef and casein digest), 1.0%; sodium chloride, 0.5%; dextrose, 0.1%, all dissolved in distilled water. In a coöperative study made by 25 laboratories in various parts of the country on 1300 milk samples, the counts obtained with this new medium and the old Standard Nutrient Agar were compared, with the following results: The average count on certified-pasteurized milk was 10% higher with the new medium; on certified raw milk it was 31% higher; on ordinary pasteurized milk it was 55% higher, and on raw milk it was 62% higher. These results indicate that the new medium is more effective in revealing the high counts of the poorer grades of milk.—J. H. BROWN, C. W. BONYNGE and H MOAK. *Am. J. Hyg.*, 27 (1938), 12. (T. C. G.)

Mucinase. A Bacterial Enzyme Which Hydrolyzes Synovial Fluid Mucin and Other Mucins. An enzyme (or enzymes), mucinase, may be isolated from broth cultures of *Clostridium perfringens* and can be purified and concentrated 900-fold by adsorption on calcium phosphate from a 50% acetone solution. Mucinase causes the loss of viscosity of solutions of synovial fluid mucin or of the prosthetic polysaccharide and subsequent liberation of amino sugars and reducing sugars; it is active in the p_H range 3.9 to 8.5; the temperature coefficient is K_{10} 1.75; inactivation takes place at 60; removal of salts causes inactivation which is reversible; and mucinase is inactivated irreversibly by cyanide, arsenite or iodine. Mucinase is not peculiar to *Clostridium perfringens* but is present in varying concentrations in the broth cultures of several other microörganisms. It hydrolyzes also the mucins of

vitreous humor, umbilical cord and connective tissue, but does not hydrolyze the mucins from mucous membranes and glands.—WILLIAM VAN B. ROBERTSON, MARIAN W. ROPES and WALTER BAUER. *J. Biol. Chem.*, 133 (1940), 261. (F. J. S.)

Poliomyelitis—Effect of Chlorination of City Water on Virus of. Chlorine in a concentration of 0.5 parts per million, which is an amount in excess of that usually employed in municipal practice, did not inactivate the virus of poliomyelitis in 1½ hours.—J. EMERSON KEMPF and MALCOLM H. SOULE. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 431. (A. E. M.)

Potassium in Serum—Iodometric Micromethod for. Potassium in serum is precipitated with Kramer-Tisdall's reagent followed by oxidation with permanganate and iodometric determination of the excess of the latter. Results agree within 2% of Kramer's method. The procedure requires but a small amount of serum and yields sufficiently exact results without previous removal of albumin.—SUSANNE DENES. *Mikrochemie*, 26 (1939), 277–281. (R. H. B.)

Serum—Convalescent, Therapeutic Importance of. Studies were made on the use of immune serum in filterable virus diseases, adding exanthematic typhus to the group. Types of immunity include antitoxic such as diphtheria and tetanus, and antibacterianic such as streptococcus and gonococcus. Smallpox, yellow fever and measles confer immunity for life. Herpes and grippe provoke greater sensitivity. The term biotropism is used for the immunity conferred by a filterable virus. An important property of this is a culture of living cells or cells in process of division. The great diffusibility and long persistence of neurotropic organisms in cells explains the reason for the value of convalescent serum in poliomyelitis, rabies, etc. Studies were made on typhus sera from two sources, one from patients infected by flea bites, the other from immunized guinea pigs. There is a relative value of poliomyelitis serum from patients recovering from paralysis and abortive cases. Homologous serum produces favorable results by early intravenous injections. In cases of poliomyelitis, when the virus invades spinal cells and produces ataxia and tremors, the serum has no therapeutic value.—ALEIXO DE VASCONCELOS. *Lab. Clin.*, 18 (1939), 29. (G. S. G.)

Sterile Alcohol by Filtration—Preparation of. Filtration of alcohol was conducted in a two-liter pressure filter with Seitz EK-14 filter disk (asbestos), connected to a 60-liter supply vessel in which the pressure was raised by connection to a cylinder of compressed nitrogen gas. Pressure of 1.5 atmospheres was found optimum for practical filtration rate. As bacteriological control of filtered alcohol the following media were used: (1) peptone bouillon, (2) semi-fluid agar, (3) peptone bouillon with beef and (4) malt-agar (for molds and yeasts). No anaerobic growth and no growths of molds or yeasts were seen. Some of the cultures were incubated at 37° C. and others were kept at 22° C. for 4 weeks. Using unfiltered alcohol, of 158 implants on meat-peptone bouillon, 5 showed growth (cocci) = 3.2%. In 1098 implants with filtered alcohol on various media 13 showed growth (rod bacilli in all and 2 showing cocci) = 1.1%. It might appear that the filter did not hold back rod bacilli or their spores (and the cocci were even smaller). The results were held by the author to indicate either that the filtration does not sterilize the alcohol or that the control of entry of air-borne infection of the media was unsuccessful. Since the rod bacilli found were types killed by alcohol within 24 hours, it was considered probable that the growths were from air-borne contamination and that the method of sterilization of the alcohol was effective.—A. T. DALZGAARD. *Dansk Tids. Farm.*, 14 (1940), 81. (C. S. L.)

Sterile Solutions—Preparation of. Requirements of a Small Hospital. A regimen has been developed for the preparation and sterilization of important solutions required in a small hospital. The stocks of solutions are mentioned to give an idea of the number of containers to purchase. A quantity which avoids frequent sterilizations is desirable. It is important, however, that solutions be used soon after they have been sterilized. The medical staff appreciate the supply of products bearing a recent date. This is achieved by keeping small stocks and replenishing them every week or two. Sterile distilled water and double strength saline are required in large amounts and stocks may need replenishing every few days. The following apparatus is described: water stills, filters, autoclave and steamer and containers.—H. LEMPERT. *Pharm. J.*, 144 (1940), 71. (W. B. B.)

Sterility of Biologic Products—Tests for the. The usual tests in Smith tubes with infusion broth are unreliable if merthiolate or similar antiseptics are used as preservatives. The use of Brewer's medium containing thioglycollate is advantageous because it permits growth of microbes in presence of the antiseptic and because it is suited for the cultivation of anaerobics.—M. S. MARSHALL, J. B. GUNNISON and M. P. LUXEN. *Proc. Soc. Exptl. Biol. Med.*, 43 (1940), 672. (A. E. M.)

Sulfanilamide—Effectiveness of, upon Anaerobic Hemolytic Streptococci. Of two weakly virulent strains, Group A, was one moderately susceptible to the drug in mice whereas the other was resistant. Bacteriostatic, phagocytic and biochemical tests *in vitro* showed no difference. Following adaptation to aerobic incubation, both strains became refractory. Anaerobiosis *per se* is not a factor determining the response to the drug.—E. H. SPAULDING and AMEDEO BONDI, JR. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 321. (A. E. M.)

Sulfanilamide in Puerperal Infections. Two cases of postabortal infection with *Clostridium Welchii* was identified in blood cultures. Sulfanilamide was prescribed and the patients' recovery was satisfactory. In this exceedingly acute and fulminating infection, particularly of the vagina, early diagnosis and immediate therapy are essential. Studies *in vitro* indicate that the action is bacteriostatic not bactericidal.—JOSEPH F. SADUSK and CONSTANTINO P. MANAHAN.—*J. Am. Med. Assoc.*, 113 (1939), 14. (G. S. G.)

Sulfathiazole—Effect of, on Staphylococcus Aureus in Vitro. Sulfathiazole is an effective bacteriostatic and bacteriocidal agent against *S. aureus* when added to defibrinated blood *in vitro*. Concentrations between 2.5 and 5 mg. per 100 cc. are necessary to obtain maximal effect. Under the conditions of the experiment it was somewhat superior to sulfamethylthiazole, sulfanilamide and sulfapyridine.—CHARLES H. RAMMELKAMP and CHESTER S. KEEFER. *Proc. Soc. Exptl. Biol. Med.*, 43 (1940), 664. (A. E. M.)

Typhoid Fever—Diagnosis of, by Cultivation of Sternal Marrow. The authors, after briefly reviewing the work of others, detail their own investigations of over 200 sternal punctures and blood cultures and compare their findings. By hemoculture 70 were positive, 141 negative (33.1% positive), by marrow culture 103 and 108, respectively, (48.8% positive). The largest proportion of positives occurred in the first-week specimens, and the ratio thereafter steadily diminished in both, but more markedly in the former; in other words, the

value of the latter over the former increases as the disease advances.—R. FRANZA and A. COLARUSSO. *Reforma Medica*, 55 (1939), 1743; through *Bull. Hyg.*, 15 (1940), 214. (T. C. G.)

Ultravirus—Recent Advances in Field of. Virus-proteins and Phage-proteins. A comprehensive review of the subject is given. Photographs of crystals are included.—R. TRUHAUT. *J. pharm. chim.*, 30 (1939), 213-232, 272-293. (S. W. G.)

Undulant Fever—Serum Diagnosis of. It is claimed that the agglutination test as used for the diagnosis of undulant fever in man is not as sensitive as the complement fixation test and that complement-fixing-antibodies persist longer in the serum than agglutinins. Altogether 62 bloods were examined, and 14 were positive by the complement-fixation test and only 7 by the agglutination test. On these grounds and also after testing sera from individuals at intervals after recovery from infection it is considered that the routine test as practiced is insufficient, although it is pointed out that there are other laboratory procedures such as blood culture, which are not being criticized in this article.—V. BADOUX. *Schweiz. med. Wochschr.*, 69 (1939), 1245; through *Bull. Hyg.*, 15 (1940), 232. (T. C. G.)

Vaccine Virus—Use of Serum as a Diluent for. One of the principal practical difficulties involved in the use of smallpox vaccine is that its potency deteriorates rapidly, especially at higher temperatures. In this work a number of substances such as gum acacia, mucin, egg yolk, serum, glycerol etc., were added to sterile tissue culture smallpox vaccine in an attempt to find a substance which would preserve the potency of the virus for the longest time. It was concluded that the best preservative was sterile beef serum, four parts being ground with one part of the vaccine pulp. Preserved in this manner, the vaccine only lost its potency after being stored for 7 weeks at 37° C. In a field test during June, July and August, 91.9% of those vaccinated with the serum-preserved vaccine gave positive reactions, as compared with the 79.7% who gave positive reactions with the old glycerin-preserved vaccine.—G. J. BUDDINGH. *Am. J. Hyg.*, 27 (1938), 530. (T. C. G.)

Yellow Fever Virus—Preservation of. Oxidation and hydrolysis are the factors credited with loss in titer of this virus. At 37.5° C. the duration of activity was found to be directly proportional to residual moisture content. At 4° C. samples of the virus retained their activity, provided the moisture was not above 4% to 5%. Regardless of moisture content virus keeps better in anaerobic conditions. Therefore dessication and anaerobic storage are indicated for preservation. The growing use of yellow fever vaccine increases the importance of this subject.—JOHN P. FOX and SVEN GARD. *Am. J. Trop. Med.*, 20 (1940), 447-451. (W. T. S.)

BOTANY

Ascorbic Acid in Plants—Studies on the Formation of I. The Influence of Light on the Ascorbic Acid Contents of Various Etiolated Seedlings. Seedlings germinated in the dark contain some ascorbic acid, but the amount is increased if light is furnished.—TOMOTA SUGAWARA. *Japan. J. Botany*, 10 (1939), 141; through *Chem. Abstr.*, 34 (1940), 2421. (F. J. S.)

Biological Nitrogen Fixation—Direct Estimation of. A gasometric method is described for detection of uptake of free nitrogen by biological agents which is based on the principle of quantitatively replacing nitrogen fixed, as well as oxygen respired, with oxygen of known purity. Tests with *Azotobacter* cultures indicate that it is reliable and possesses reasonable accuracy. Its advantages over Kjeldahl methods for use with heterogeneous substrates, as seeds and plant tissues, which are initially high in organic nitrogen are discussed.—C. HURWITZ and P. W. WILSON. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 31-33. (E. G. V.)

Botanical Classification—Chemical Analysis as an Aid to.—R. H. F. LANSKE. *Can. Chem. Process Inds.*, 23 (1939), 199, 210; through *Chem. Abstr.*, 34 (1940), 2414. (F. J. S.)

Chlorophyll. Chlorophyll, the green coloring of leaves and stems, is discussed. The extraction process and the uses of chlorophyll are also discussed.—ANON. *Chemist and Druggist*, 132 (1940), 471. (A. C. DeD.)

Chlorophyll and Carotene—Determination of, in Plant Tissue. The photoelectric colorimeter is used with suitably selected filters to determine chlorophyll in acetone extracts of plant tissue without removal of other pigments and to determine carotene in petroleum ether solution after removal of all other pigments. A method for the removal of chlorophyll from acetone or alcohol extracts of plant tissue has been devised. It involves the use of activated solid barium hydroxide or finely divided solid barium hydroxide octahydrate.—H. G. PETERING, W. WOLMAN and R. P. HIBBARD. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 148-151. (E. G. V.)

Chlorophyllase. Chlorophyll may be enzymatically hydrolyzed in three solvents, for which optimal conditions in a period varying from some minutes to 24 hours are as follows: ethanol, 80%, 25°; acetone, 40% to 70%, 25°; water, 75°. Virtually no activity is found with wild oats; spinach shows at times high activity in water, but little in acetone or alcohol; figwort shows extremely high activity in alcohol, but none in water; numerous other plants investigated show intermediate activities. The enzyme is difficult to extract and best results with enzyme meal indicate at least a 50% reduction in activity.—C. A. WEAST and G. MACKINNEY. *J. Biol. Chem.*, 133 (1940), 551. (F. J. S.)

Ergot—Germination of. The collection of the drug, life history of the fungus and the experimental germination are discussed.—T. C. DENSTON. *Chemist and Druggist*, 132 (1940), 470. (A. C. DeD.)

Nitrogen Fixation and Total Bacterial Count on the Application of Energy Materials to Alkali Soils. Nitrogen fixation in alkali soils on the addition of energy materials like carbohydrates was studied. As in the case of normal soils, nitrogen fixation takes place in the alkali soils and it is always greater in those soils which are exposed to sunlight than in soils kept covered although the total bacterial numbers are smaller in the former. The nitrogen fixed per Gm. of carbon oxidized is greater in soils exposed to light than in the covered soils and the order of fixation is more or less the same as that obtained with normal soils.—N. R. DHAR and E. V. SESHACHARYULU. *J. Indian Chem. Soc.*, 17 (1940), 521. (F. J. S.)

Plant Hormones—Technical Preparation of. An extensive review of the literature on plant hormones and a discussion of their preparation from plant material.—I. F. J. H. DAVIS. *Pharm. Tidschr. Nederland.-Indië*, 16 (1939), 387. (E. H. W.)

Plant Names—Meaning of. Mistletoes, Cactuses and Allies. The common name mistletoe is said to be derived from two words meaning "different" and "twig" indicating that it is different from the tree on which it grows. The generic name of our species, *Phorodendron*, is appropriately derived from two Greek words meaning "thief" and "tree." *Aristolochia*, represented in pharmacy by *A. serpentaria*, comes from two Greek words meaning "excellent birth" which alludes to its medicinal properties.

The specific name *serpentaria* also indicates its medicinal use.—WILLARD N. CLUTE. *Am. Botanist*, 46 (1940), 45–51. (W. T. S.)

Pollen Researches in Different Branches of Knowledge—Significance of. A discussion dealing with the significance of pollens in medicine, in the determination of the origin of honey, forest conservation, prehistorical times and geology. Thirteen references.—FRIEDRICH THIERGART. *Deuth. Apoth. Ztg.*, 54 (1940), 599–603. (H. M. B.)

Resin in the Larch (Larix Europaea)—Formation and Distribution of. A morphological study reported under the following headings: anatomical structure and formation of resinous canals, distribution of resinous canals in the wood and pathological secretion of the resin, together with 11 sketches of microscopical structure. Numerical data for the distribution of resinous canals in *L. europœa* from 4 localities are tabulated. Data are also presented to show the relation between sp. gr., proportion of fiber wall and resistance to compression for larch and 14 other woods.—PAUL JACCARD, A. BOURQUIN and G. H. BORNAND. *Eidgenöss. Materialprufungsu. Versuchsanstalt Ind., Bauw. Gewerbe, Zurich, Ber.*, 97 (1939), 18 pp.; through *Chem. Abstr.*, 34 (1940), 2416. (F. J. S.)

Starch in Plants—Determination of. After grinding plant material to 50- or 60-mesh it is treated with dilute alcoholic hydrochloric acid to convert the starch into soluble form, and the solubilized starch is completely extracted with hot water. The extract containing the starch is buffered with acetate buffer, p_H 5.6, hydrolyzed with salivary amylase, determined as maltose by oxidation with ferricyanide and titrated with ceric sulfate. The method does not require grinding the plant material in a ball mill. It is specific, rapid, applicable to small amounts and gives results duplicable within 5%. W. Z. HASSID, R. M. MCCREADY and R. S. ROSENFELS. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 142–144. (E. G. V.)

Sunflower (Helianthus Annuus). The cultivation, commercial handling, use and composition of the seed and products are recorded.—L. A. ELMER. *E. African Agric. J.*, 4 (1938), 218–225; through *J. Soc. Chem. Ind.*, 58 (1939), 1162. (E. G. V.)

CHEMISTRY

GENERAL AND PHYSICAL

Benzaldehyde—Thermal Decomposition of. The equation $C_6H_5CHO \rightarrow C_6H_6 + CO$ represents the thermal decomposition of gaseous benzaldehyde. The reaction is of the first order above 100 mm. and is subject to inhibition by nitric oxide. In these respects it differs from the corresponding reaction of CH_3CHO. Similar to the reaction of CH_3CHO, the residual inhibited reaction shows a dependence on pressure. As the pressure decreases the activation energy increases. These findings can be explained by assuming the superposition of a chain and a molecular reaction. The probable mechanism of the chain part of the decomposition, which appears to involve the CHO radical, is indicated by the order of the uninhibited reaction and the influence of nitric oxide at different initial pressures of benzaldehyde.—C. N. HINSHELWOOD and R. E. SMITH. *Proc. Roy. Soc.* (London), B, 128 (1940), S 17. (W. T. S.)

Bile Salts—Micelle Formation in Aqueous Solutions of. Osmotic coefficient concentration and equivalent conductivity concentration curves were determined for sodium glycocholate, sodium cholate, sodium glycodesoxycholate and sodium oleate at 25°. The results indicate that the bile salts form ionic micelles above a critical concentration. It is suggested that solution of water-insoluble substances by the bile may be associated with micelle formation of the bile salts in a manner similar to the solution of oils by soap solutions.—RAYMOND R. ROEPKE and HAROLD L. MASON. *J. Biol. Chem.*, 133 (1940), 103. (F. J. S.)

Carbon Dioxide—Catalytic Hydration of. The velocity constants for the hydration of CO_2 according to the reactions $H_2O + CO_2 \rightleftarrows H_2CO_3$ and $CO_2 + OH^- \rightleftarrows HCO_3^-$ were measured by a manometric method. Bromine, hypobromous acid, chlorine and hypochlorous acid are strong inorganic catalysts for the hydration of CO_2. Br_2 is stronger than Cl_2. They are particularly effective in the alkaline range. Iodine, hypoiodous acid, the halogenides, halogenates and perhalogenates do not have significant catalytic effects. Sulfite and selenite are weaker catalysts for the hydration of CO_2 than Cl_2 and Br_2. They have an optimal activity between p_H 7 and 8. Weight for weight, carbonic anhydrase is at least 10^3 times more active than Br_2. The dissociation constant of hypochlorous acid at 5° was found to be $K' = 2.8 \times 10^{-8}$ and that of hypobromous acid at 5°, $K' = 1.0 \times 10^{-9}$.—M. KIESE and A. B. HASTINGS. *J. Biol. Chem.*, 132 (1940), 267. (F. J. S.)

Carotene—Properties of Colloidal Solutions of. A study was made of the behavior of aqueous colloidal α- and β-carotene solution toward light. The nature of the absorption spectra of these solutions, their photosensitivity and the position of the maximums depends to a considerable extent on the degree of dispersion of the compounds; at a certain degree of subdivision the sensitivity of the pigments to temperature and to light becomes very high. The decolorization phenomena favored by heat and rise in temperature are due to oxidation processes and do not take place in total absence of oxygen.—P. KARRER and W. STRAUS. *Helv. Chim. Acta*, 21 (1938), 1624–1636; through *Chimie & Industrie*, 42 (1939), 119. (A. P.-C.)

Colloids—Some Recent Advances in. A review.—J. W. MCBAIN. *J. Chem. Educ.*, 17 (1940), 109–111. (E. G. V.)

Dispersions or Emulsions—Manufacture of. Polyvinyl alcohols or water-soluble derivatives thereof are treated with sulfonating agents (sulfuric acid, chlorosulfonic acid) or agents containing sulfonic acid groups, *e. g.*, aldehydesulfonic acids, to give products which contain one or several bisulfates and are used as agents in the preparation of aqueous dispersions or emulsions.—W. W. GROVES. From I. G. FARBENIND. A.-G. Brit. pat. 513,076; through *J. Soc. Chem. Ind.*, 58 (1939), 1211. (E. G. V.)

Electrokinetic Aspects of Surface Chemistry. IX. The Electric Mobilities of Quartz and Collodion Particles in Mixtures of Horse Serum and Serum Proteins in Relation to the Mechanism of Film Formation. The electrophoretic mobilities of quartz and collodion particles were determined after exposure to mixtures of serum proteins or after they had been coated with one protein and then exposed to another or to serum. The results indicate that there is little tendency for the various constituents used to adsorb on each other, although one protein may replace another at a surface. The result is usually a film of one of the protein components rather than a mosaic. The nature of the underlying surface influences the adsorption, with the more hydrophilic proteins being adsorbed more readily by the more hydrophilic surface, and vice versa. In certain cases the results are complicated by irreversible adsorption. The biological significance of these findings is discussed.—LAURENCE S. MOYER and MANUEL H. GORIN. *J. Biol. Chem.*, 133 (1940), 605. (F. J. S.)

Emulsion Type—Question of. Certain useful generalities can be stated concerning emulsion type, such as which type is the more useful for specific purposes, the characteristics of each type and the conditions favoring their formation. But for few of these statements can universality be claimed. Cosmetic technology has advanced considerable in recent years, and it seems a far cry from those days when a "beauty cream, it was a cream, a cream, and nothing more," when, indeed, it was often not a cream at all, but an ointment or a gel, and nothing was known concerning emulsion type. Nevertheless, considerable work remains to be done before it can be claimed that the technology of emulsion production has been placed on a firm basis of scientific knowledge. It is partly in the hope of stimulating further research in this domain that the present article has been written, and partly to give cosmetic manufacturers such information of practical utility as is at present available concerning the question of emulsion type.—H. STANLEY REDGROVE. *Perfumer. Essent. Oil Record*, 31 (1940), 165. (A. C. DeD.)

Emulsions—Stability of. I. Soap-Stabilized Emulsions. Hitherto emulsion stability has been an ill-defined and qualitative term. It is the object of the present series of papers to define emulsion stability quantitatively and to make a quantitative survey of the different types of emulsifying agents with a view of assessing their industrial efficiency. In the present paper results on soap-stabilized emulsions are reported. By means of the size frequency technique, a large number of emulsions have been examined and the distribution of their globules measured. In general these globules become coarser with time, but, in the case of homogenized emulsions, particles larger than 7.5 microns coalesce and appear as free oil. The total area of interface per Gm. of emulsified oil has been calculated for each emulsion and is found to decrease linearly with time; the reciprocal of this decrease is defined as emulsion stability (ξ). It has been shown that the mechanical method of emulsification influences both degree of dispersion and stability; the effect of adding calcium chloride or hydrochloric acid, or of heating the emulsions, is to increase the globule size and to decrease the stability, acting thus as accelerated aging. In general, it may be concluded that soaps form fine, but not very stable, emulsions. Sodium and potassium soaps of the same fatty acid possess an emulsifying efficiency of the same order; ammonium soaps are inferior. Oleates are more efficient than stearates and much more efficient than palmitates.—A. KING and L. N. MUKHERJEE. *J. Soc. Chem. Ind.*, 58 (1939), 243–249. (E. G. V.)

Esters in Dilute Solutions—Kinetics of the Saponification of. A Study of the Effect of Substitution on the Rate-Determining Factors. A kinetic study of the saponification of eleven aliphatic esters, $R'CO\text{-}OR$ (where R and R' vary from CH_3 to C_5H_{11}) has been made in pure and dilute aqueous solutions. Analysis of the results on the basis of the equation $K = PZe^{-E/RT}$ shows that changes in velocity are due in a greater measure, if not entirely, to changes in the steric factor. In the case of normal esters, however, the energy of activation shows a slight but progressive increase as the series is ascended, whereas for isomeric esters the energy of activation is practically the same. These observations have been discussed in the light of the results obtained by others.—HIRALAL SHRIVASTAVA. *J. Indian Chem. Soc.*, 17 (1940), 387. (F. J. S.)

Fruit Pectins—Chemical Behavior and Jellying Properties of. Methods of characterizing pectins and determining their jellying power are reviewed. The preparation of specimen samples from fruits, the variation in their properties and the effects of heating, pectase, alkalis, acids and salts are described.—C. L. HINTON. *Dept. Sci. Ind. Res., Food Invest., Spec. Rept.*, No. 48 (1939), 96 pp.; through *J. Soc. Chem. Ind.*, 58 (1939), 1287. (E. G. V.)

Hydrosols of Shellac and Other Natural Resins—New Method of Preparing, and Their Properties. A method for the preparation of concentrated clear hydrosols of shellac, rosin, mastic, etc., has been described and a brief study of their physicochemical and colloidal properties has been made. The shellac sols have been found to produce thin, transparent varnish films on air-drying which are harder and more water-resistant than ordinary shellac films from French polish.—SANTI RANJAN PALIT. *J. Indian Chem. Soc.*, 17 (1940), 375. (F. J. S.)

Osmotic Pressure, Molecular Weight and Dissociation of Limulus Hemocyanin. From osmotic pressure measurements of limulus hemocyanin (the copper-containing, respiratory blood protein of the horseshoe crab) in isoelectric urea solutions, the mean molecular weight (corrected for deviations) was found to be 142,000, or smaller than that observed in aqueous isoelectric buffer solutions. After treatment with acid at about p_H 3, which removes the copper from the protein, limulus hemocyanin was found to have a molecular weight in urea solution of 69,000, or approximately one-half that of the copper-containing hemocyanin in urea. The minimal molecular weight estimated from chemical analysis appears to be 36,800; and the limulus hemocyanin unit of molecular weight 147,000 appears to possess one prosthetic group containing 4 atoms of copper.—NORVAL F. BURK. *J. Biol. Chem.*, 133 (1940), 511. (F. J. S.)

Oxalate-Iodine Reaction—Photochemical After-Effect in the. The after-effect rate in the oxalate-iodine reaction increases with the length of period of pre-illumination. The shapes of the curves obtained indicate that the after-effect rate of reaction is identical with the photochemical rate at the instant of darkening. It falls off very rapidly at first, so that it has already been largely reduced by the time the first reading is taken. The duration of the after-effect, *i. e.*, the period during which a measurable falling velocity can be detected by the disappearance of I_2, is independent of the temperature and the period of pre-illumination. The end-rates, when the fall in velocity becomes very slow, are found to be at a higher level than the normal dark reaction to an extent depending upon the period of pre-illumination. The value of the "secondary after-effect" obtained by adding fresh iodine in the dark to solutions in which all the original iodine has been used up by exposure to light is diminished (*a*) with increase of the time interval between decolorization and addition of iodine, (*b*) with increase of temperature and (*c*) with increase of the concentration of KI. In the absence of iodine the "activity" disappears completely in the course of time, depending upon the temperature. Solutions of free oxalic acid and iodine react photochemically but there is no after-effect. Mixtures of oxalate (or oxalic acid) and iodine from which all the molecular iodine has been removed photochemically do not reduce mercuric chloride, indicating the absence of "activated oxalic acid" in the sense in which the term has been applied in the premanganate-oxalate reaction. A mechanism has been suggested dispensing with assumptions about the existence of activated molecules and depending solely upon a simple extension of the Berthoud chain mechanism for the oxalate-iodine photoreaction.—P. S. MACMAHON and BIJAN BIHARI LAL. *J. Indian Chem. Soc.*, 17 (1940), 429. (F. J. S.)

Pharmaceutical Preparations—Apparent Specific Volume of. A simple method for determining ap-

parent specific volume is described and data thus obtained for 31 pharmaceutical substances are tabulated.—R. MAZZUCCO. *Boll. chim.-farm.*, 78 (1939), 517-519; through *J. Soc. Chem. Ind.*, 59 (1940), 85. (E. G. V.)

Pharmaceutical Work in Passive Defense. Physicochemical Principles of Protection against Chemical Action. The applications of adsorption, vapor pressure, capillarity and filtration to defense activities are discussed.—P. ERCULISSE. *J. pharm. Belg.* 22 (1940), 53-61, 76-80. (S. W. G.)

Plasmoquine—Dissociation Constants of. All major natural and synthetic anti-malarials possess basic groupings, usually two. The range of their dissociation constants, especially in relation to body p_H, probably governs their therapeutic efficiency. This is borne out by the alkaloids of cinchona. The dissociation constants of atebrin have been determined previously, and now those of plasmoquine are reported. All anti-malarials of the plasmoquine type possess both a strong and a weak dissociation constant. Since these compounds may exist as (1) the unhydrated base, (2) the hydrated but undissociated base or (3) the dissociated base, it is necessary to speak of their "true" and "apparent" dissociation constants. The reaction between (1) and (2) proceeds in accordance with the hydration constant. The reaction between (2) and (3) proceeds in accordance with the dissociation constant giving the true value. In practice it is easier to determine the apparent constant obtained from the relation between (1) and (3). Therefore in the case of amines it is difficult to find the true constant since the hydration constant must first be determined. Titration of the dihydrochloride of plasmoquine revealed its apparent dissociation constants to be 3.93 and 10.51, respectively. The stronger one is likely connected to the diethylamino group and the other comes from either the quinoline nitrogen or the one at position 8.—RICKARD CHRISTOPHERS and J. D. FULTON. *Am. Trop. Med. Paras.*, 34 (1940), 1-11. (W. T. S.)

Potassium Persulfate and Alkyl Iodides—Kinetics of the Reaction between. III. Catalytic Activity of a Weak Acid. A detailed study of the hydrogen ion catalysis in the persulfate-alkyl iodide reaction was made by using a weak acid (acetic) as a source of the catalyst. The hydrogen ion concentration was controlled by the addition of neutral salts, sodium acetate and by varying the concentration of the acid itself. "Secondary electrolyte effect" was observed in the presence of neutral salts. The catalytic coefficients of acetate ions and of molecules of undissociated acetic acid have also been determined. The reaction is accelerated by hydrogen and acetate ions and retarded by molecules of undissociated acetic acid.—M. S. TELANG and V. V. NADKARNY. *J. Indian Chem. Soc.*, 17 (1940), 381. (F. J. S.)

Resin Solutions—Physical Chemistry of. I. Anomalous Solubility of Shellac and Other Resins in Organic Solvents. Influence of water and other polar helpers on the shellac–acetone system has been investigated on a quantitative basis, and wide discrepancies among the solubility values as reported by different workers have been attributed to the presence of minute traces of moisture either in solutes or in solvents. Many other solubility peculiarities of resins have also been attributed to the same or similar cause.—SANTI RANJAN PALIT. *J. Indian Chem. Soc.*, 17 (1940), 308. (F. J. S.)

Resins—Synthetic, Adsorptive Properties of. IV. The adsorption of homologous series of mono- and dibasic aliphatic acids by acid- and alkali-condensed phenolic resins, amino- and protein resins has been studied. The reversal of Traube's rule in the case of alkali-condensed, amino- and protein resins is explained on the basis of orientation of molecules at the resin-solvent surface according to the theory put forward by Langmuir and Harkins. The influence of various substituents on adsorption has also been studied. The adsorption by ammonia-condensed amino- and protein resins increases with the introduction of COOH, OH, CN, Cl and Br. The NH_2 and the alkyl groups cause a decrease in adsorption. The results obtained in the case of acid phenolic resins are quite the opposite to those in basic resins. This is probably due to the fact that acid resin is less polar than water. In non-polar solvents results are in line with those obtained in basic resins.—S. S. BHATNAGAR, A. N. KAPUR and M. S. BHATNAGAR. *J. Indian Chem. Soc.*, 17 (1940), 361. (F. J. S.)

Solutions—Compound Formation in. I. Pyridine and Acetic Acid. Singularities in physical properties accompanying compound formation in binary liquid mixtures are discussed and it is pointed out that a maximum in viscosity-concentration curve is not a conclusive evidence of compound formation. Intensity and depolarization of scattered light and magnetic susceptibilities of pyridine-acetic acid mixtures of different concentrations are determined and these experiments seem to indicate the formation of a chemical complex containing 60 mol. % of the acid and 40 mol. % of pyridine. Viscosity-concentration curve, however, shows a maximum for a mixture containing 78 mol. % of the acid.—S. VENKATARAMAN. *J. Indian Chem. Soc.*, 17 (1940), 297. (F. J. S.)

Sodium Formate and Aqueous Iodine—Reaction between. The reaction between aqueous iodine and sodium formate has been studied in the dark and the effect of various salts, such as KCl, NaCl, NH_4Cl, K_2SO_4, $NaNO_3$ and NH_4I investigated. It is observed that the effect of the three chlorides is similar: velocity constant at first increases with the concentration of chlorides and then falls. Although Cl ions act as positive catalyst, K, Na and NH_4 ions retard the reaction, the order being $NH_4 > Na > K$. It also appears that NaCl, KCl and NH_4Cl molecules likewise retard the reaction. The effect of iodide ion in NH_4I is comparable to that in KI. Temperature coefficient of the reaction in aqueous iodine is less than in the presence of KI. The relation between intensity and velocity for this reaction in the presence and absence of KI and other salts has been investigated and in all cases the relationship was found to be less than direct.—W. V. BHAGWAT. *J. Indian Chem. Soc.*, 17 (1940), 304. (F. J. S.)

Surface Chemistry—Some Aspects of, Fundamental for Biology.—W. D. HARKINS. *Pubs. Am. Assoc. Advancement Sci. No. 7, Recent Advances in Surface Chemistry and Chem. Phys.*, (1939), 19-46; through *Chem. Abstr.*, 33 (1939), 8078. (E. G. V.)

Thorium Arsenate Gels—Viscosity of, during Setting. The viscosities of thorium arsenate gel-forming mixtures were measured during setting, using different amounts of the constituents of the gel-forming mixtures and adding extra amounts of electrolytes and non-electrolytes at different temperatures. The viscosity-time curves are either rapidly rising or are S-shaped. The viscosity at a certain time decreases with (*a*) an increase of thorium ions in the gel-forming mixture, (*b*) the addition of non-electrolytes and (*c*) the increase of temperature. Viscosity increases with an increase in the amount of arsenic acid and with the addition of greater amounts of electrolytes.—MATA PRASAD and B. G. SHEJWALKAR. *J. Indian Chem. Soc.*, 17 (1940), 508. (F. J. S.)

Vaselines—X-Ray Spectrography of. Eight vacuum-distilled fractions of a white vaseline gave diffraction patterns of progressively decreasing in-

tensity and the residue showed no structure. The more crystalline fractions are believed to contain C_{33-49} chains.—C. L. ALEXANIAN. *Bull. assoc. franç. techniciens pétrole*, No. 45 (1938), 43–46; through *J. Soc. Chem. Ind.*, 58 (1939), 1201. (E. G. V.)

INORGANIC CHEMISTRY

Boron—Determination of Small Amounts of, in Plants. The boron is removed from samples by distillation as methyl borate in the usual manner and collected in *N* sodium hydroxide. The distillate is treated with hydrogen peroxide to oxidize the sulfite ion, evaporated to dryness and the residue heated to fusion to destroy organic acids. The melt is extracted with water and neutralized (phenolphthalein, boiling) with hydrochloric acid. After addition of mannitol, the borate ion is titrated with sodium hydroxide (phenolphthalein).—O. UNVERDORBEN and R. FISCHER. *Bodenkunde u. Pflanzenernähr.*, 13 (1939), 177–194; through *J. Soc. Chem. Ind.*, 58 (1939), 1159. (E. G. V.)

Cerate Oxidimetry. The electrolytic oxidation of cerium without the use of a diaphragm cell is described, together with a procedure for the regeneration of spent solution of cerous salts.—G. F. SMITH, G. FRANK and A. E. KOTT. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 268-269. (E. G. V.)

Chlorine—Action of, on the Hydroxides of Alkaline Earths in the Presence of Iodine. II. By passing chlorine through hot solutions of iodine in the hydroxides of the alkaline earths, the corresponding iodates in the hydrated form are precipitated in each case. There is no formation of periodate by this method.—R. K. BAHL and SURJIT SINGH. *J. Indian Chem. Soc.*, 17 (1940), 397. (F. J. S.)

Chromic Sulfate and Manganese Dioxide—Heterogeneous Reaction between. The velocity of the heterogeneous reaction between finely divided powdered manganese dioxide and chromium sulfate solution has been studied. The reaction has been found to be analogous to the decomposition of ammonia.—MATA PRASAD and M. A. NAQVI. *J. Indian Chem. Soc.*, 17 (1940), 370. (F. J. S.)

Distilled Water—Still for Producing Metal Free. Forms of quartz condenser tubes are described.—J. S. MCHARGUE and E. B. OFFUTT. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 157–159. (E. G. V.)

Iodine in Inorganic System—Note on the Reactions and Exchange of Active. With radioactive iodine as an indicator, the exchange reactions between mercuric iodide and ammonium iodide were examined qualitatively; the iodine of the latter compound was rendered active by previous irradiation of its solution with slow neutrons. The resulting complex, $(NH_4)_2.HgI_4$, was subsequently decomposed into its components by dilution with a large quantity of water. The precipitated mercuric iodide was found to be active when examined in a Geiger-Müller counter. Similar results were obtained with bismuth and lead iodides which form the following complexes, $(NH_4)BiI_4$ and $(NH_4)_2PbI_4$, respectively. $xNH_4I^* + MeI_{4-x} \rightarrow (NH_4)_xMeI_4^* \rightarrow xNH_4I^* + MeI_{4-x}^*$, where Me = Hg, Bi or Pb; I* represents the active iodine atom. The results show that there is no real difference between the normal co-valency and the coördinate co-valency.—SHYAMADAS CHATTERJEE and PRIYADARANJAN RAY. *J. Indian Chem. Soc.*, 17 (1940), 524. (F. J. S.)

Magnesium Silicates by the Interaction of Magnesium Salts and Alkali Metal Silicates—Preparation of. In view of the recent interest in the use of silicates of magnesium in clinical medicine, a review of the literature on the wet reaction between magnesium sulfate (or chloride) and sodium (or potassium) silicate was made. Paragraphs are quoted from Döbereiner, Lefort, Von Ammon, Haushofer, May, Glass, Roseman and co-workers, Britton, Joffe and co-workers. The matter of nomenclature is discussed. Experimental work is reported. A graph comprising idealized curves shows how the SiO_2 percentages and the corresponding ratios, SiO_2/MgO, are related.—R. ROSEMAN, H. EISENBERG and M. B. LEVIN. *Jour. A. Ph. A.*, 29 (1940), 271. (Z. M. C.)

Phosphates—Removal of, from Solutions of Hydrogen Peroxide. Place 100 cc. of peroxide in a 250-cc. beaker. Add 10 cc. of 2% ferric chloride, stir the solution and then add about 5 Gm. of calcium carbonate. Stir again for a moment and filter immediately by suction through a Buchner funnel prepared previously. The filtrate should be clear and almost colorless. Add 0.5 cc. of concentrated hydrochloric acid to the purified peroxide and store in a black bottle. Prepare a week's supply at a time. Five cc. of the peroxide were evaporated to dryness and, by analysis by a colorimetric method, contained 0.2 p. p. m. of phosphorus. The peroxide loses very little activity by this treatment.—S. R. DICKMAN and R. H. BRAY. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 279. (E. G. V.)

Potassium Metaperiodate and the Soluble Salts of Metals of Alkaline Earths—Interaction between. On boiling a solution of potassium metaperiodate, KIO_4, with the soluble salts of the alkaline earths, the corresponding dimesoperiodates in hydrated form are precipitated. These are octahydrated calcium dimesoperiodate, $Ca_2I_2O_9.8H_2O$, octahydrated strontium dimesoperiodate, $Sr_2I_2O_9.8H_2O$, and tetrahydrated barium dimesoperiodate, $Ba_2I_2O_9.4H_2O$.—R. K. BAHL and MANOHAR LAL. *J. Indian Chem. Soc.*, 17 (1940), 395. (F. J. S.)

Qualitative Chemical Analysis—Scheme for, Employing Spot Tests. The tests for metallic radicals follow the usual group separations. The tests are carried out by spotting on a strip of pure filter paper, with a spot plate, or in small test-tubes.—W. C. DAVIES. *J. Chem. Educ.*, 17 (1940), 231–234. (E. G. V.)

Silica—Silicomolybdate Method for. To a 100-cc. sample, suspected of containing minute quantities of dissolved silica, add 2 cc. of a 10% ammonium molybdate solution. Mix and immediately acidify to a p_H of 1.6 to 2.0 (the authors used 1 cc. of 4*N* sulfuric acid). The amount of acid needed should be predetermined from p_H measurements of the original sample. (It is important that the acid be added immediately following the addition of ammonium molybdate. If there is more than a minute's delay, the time required for full color development is appreciably increased.) After 10 minutes compare with standards or read in a photometer from which a standard calibration has been made.—H. W. KNUDSON, C. JUDAY and V. W. MELOCHE. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 270–273. (E. G. V.)

Ternary System. Potassium Nitrate, Ammonium Nitrate and Water at 25°. In the system KNO_3–NH_4NO_3–H_2O, studied at 25°, the two salts do not form any double salt or a salt hydrate.—R. K. BAHL and SURJIT SINGH. *J. Indian Chem. Soc.*, 17 (1940), 441. (F. J. S.)

ORGANIC

Alkaloids

Adrenaline and Morphine—Quantitative Colorimetric Assay of, by the Iodoxybenzoate Reaction. *o*-Iodoxybenzoates react with phenolic compounds, including adrenaline and morphine, and with aromatic amines to yield colored compounds. In as-

says for morphine and adrenaline by this reaction, the reaction time, iodoxybenzoate concentration and p_H must be controlled to obtain accurate results. Since the colored products of the reaction are unstable, a calibrated Pulfrich photometer should be used in routine analyses.—C. ROBERT MOODEY and G. A. EMERSON. *Univ. Calif., Pub. Pharmacol.*, 1 (1939), 235; through *Chem. Abstr.*, 34 (1940), 2532. (F. J. S.)

Alkaloid of Berberis Umbellata Wall. I. Isolation and Examination of Umbellatine. From the stem bark of *Berberis umbellata* a new alkaloid of the molecular formula $C_{21}H_{21}O_8N$ has been isolated. It contains one methylenedioxy group, two methoxy groups and one imino group. The new alkaloid has been designated as umbellatine.—R. CHATTERJEE. *J. Indian Chem. Soc.*, 17 (1940), 289. (F. J. S.)

Alkaloids—Chemical Microscopy of Some Toxicologically Important. A systematic microscopical study of the reactions of fifty reagents with twenty alkaloids is presented. Detailed crystallography of the precipitates is listed, together with twelve sets of photomicrographs.—W. F. WHITMORE and C. A. WOOD. *Mikrochemie*, 27 (1939), 249–334. (R. H. B.)

Alkaloids—Dissociation Constants and Titration Exponents of. The author presents constants for some of the less common alkaloids including, dicodide, dilaudide, β-eucaine, eukodal, heroine, homatropine, scopolamine, stovaine, alypine, optochine and yohimbine. A more extensive table of alkaloidal constants is also given.—N. SCHOORL. *Pharm. Weekblad*, 76 (1939), 1497. (E. H. W.)

Alkaloids—Extraction of, and Their Determination in Drug Mixtures. Alkaloids are best determined (*a*) in solutions of bases or their salts or in neutral mixtures by titrating against 0.1*N* sodium hydroxide, using phenophthalein (the end-point is sharper with atropine and codeine in presence of chloroform, and with morphine in acetone using Poirier-blue), and (*b*) in medicinal preparations by the Schulek-Szegho method. Ampul liquids, best examined according to (*b*), frequently contain free hydrochloric acid, which must be neutralized before titrating alkaloids.—G. A. VAISMAN and M. M. JAMPOLSKAJA. *Sovet. Farm.*, 5 (1934), No. 8, 20–24; through *J. Soc. Chem. Ind.*, 58 (1939), 1291. (E. G. V.)

Alkaloids—Microchemical Separation of Some Toxicologically Important. A scheme for the successful separation and identification of milligram quantities of twenty of the most important narcotic alkaloids is presented. The method is most useful when the total quantity of the alkaloids in 1 milliliter of aqueous solution ranges from 0.5 to 3 mg. and when not more than three alkaloids are present at a time. If only one alkaloid is present, less than $^1/_2$ mg. can be isolated and definitely identified. It is possible to separate less than $^1/_2$ mg. of morphine from a mixture of the bases studied.—W. F. WHITMORE and C. A. WOOD. *Mikrochemie*, 28 (1939), 1–13. (R. H. B.)

Alkaloids—Principles of the Determination of, in Drugs and Pharmaceutical Preparations. In general the alkaloids are estimated in three steps: (1) liberation from the drugs or from their salts by treatment with alkali for subsequent transfer to a suitable organic solvent; (2) solution and separation of the alkaloid from the aqueous phase and drug residue preparatory to a certain purification, especially clarification of the solution; and (3) titration of the alkaloid after evaporation of the organic solvent. The manner of carrying out these various steps is discussed in detail, with examples.—W. POETHKE. *Pharm. Zentralhalle*, 79 (1938), 601–609; through *Chimie & Industrie*, 42 (1939), 104. (A. P.-C.)

Alkaloids—Vitali's Reaction for. No violet color appears with the esters of phenylgycolic acid in the test of Vitali. However, with concentrated sulfuric acid, potassium nitrate and alcoholic potassium hydroxide under continuous agitation, the violet color can be observed even with homatropine, novatropine and euphthalmine.—L. EKKERT. *Magyar Gyógyszerésztud. Társaság Ertesítöje*, 14 (1938), 640–645; through *Chimie & Industrie*, 42 (1939), 114. (A. P.-C.)

Aminometry of the Alkaloids. II. Amines, Alkaloids and Alkaloid-Containing Drugs. A large number of primary, secondary and tertiary aliphatic and aromatic amines, as also alkaloids of definite constitution, were examined, especially such amines and alkaloids containing several nitrogen atoms in the molecule. In this connection an attempt was made to simplify the formerly reported aminometric titration procedure for evaluation of ergot; the aminometric estimation of morphine in opium and its galenical preparations, and finally to develop an aminometric evaluation of belladonna leaves and its preparations.—R. DIETZEL and W. PAUL. *Arch. pharm.*, 276 (1938), 408–419; through *Chimie & Industrie*, 42 (1939), 112. (A. P.-C.)

Benzonicotine—Synthesis of. A synthesis of benzonicotine has been described starting from ethyl quinoline-3-carboxylate and *N*-methylpyrrolid-2-one according to Späth's synthesis of nicotine from ethyl pyridine-3-carboxylate.—B. K. NANDI. *J. Indian Chem. Soc.*, 17 (1940), 285. (F. J. S.)

Chaksine, the Alkaloid of Cassia Absus, a New Formula for, and Some Experiments on Its Constitution. The formula of chaksine has been found to be $C_{11}H_{21}O_3N_3$ and not $C_{12}H_{21}O_2N_3$ as suggested by Siddiqui and Ahmed.—HANS RAJ KAPUR, KIDAR NATH GAIND, KARTAR SINGH NARANG and JNANENDRA NATH RAY. *J. Indian Chem. Soc.*, 17 (1940), 281. (F. J. S.)

Cinchona Alkaloids—Action of Resorcinol on the Bihydrochlorides of the. Resorcinol reacts equimolecularly with the bihydrochlorides of quinine, quinidine, cinchonidine and cinchonine in aqueous solution. The reaction takes place exothermically at ordinary temperature. The reaction mixture is heated on the water bath until complete solution is obtained. The solution is filtered hot and allowed to crystallize spontaneously. In every case there were obtained well-crystallized salts that were neither hygroscopic nor efflorescent. They are very soluble in water and in alcohol, and insoluble in chloroform, ether and benzene.—M. ROSSIGNOL and A. RIBOULLEAU. *Compt. rend. acad. sci., U. R. S. S.* 207 (1938), 495–497; through *Chimie & Industrie*, 42 (1939), 102. (A. P.-C.)

Coca Leaves, Java—Absence of *l*-Benzoylecgonine from, and Presence of Methyl *l*-Ecgonine in. *l*-Benzoylecgonine is shown to be absent from Java coca leaves and the use of hot benzene for the extraction of the bases from the leaves is therefore unnecessary. The presence of an ester, probably the methyl ester, of *l*-ecgonine in Java coca leaves is established and it is shown that the method of the Health Organization of the League of Nations for the determination of "ether-soluble ecgonine alkaloids" is inaccurate for Java leaves since there remains in the bicarbonate solution, from which the bases are extracted by a mixture of light petroleum and ether, a quantity of this ester up to 10% of the amount of cocaine present. Difficulty arises in devising a method for the separation of this ester from

the amino acid esters present. A possible solution depends on determination of the amount of methyl *l*-ecgonine present by observation of the optical rotation of the bicarbonate solution after removal of the cocaines and determination of the decrease in rotation resulting on racemization by boiling the residue from the solution with 20% potassium hydroxide solution.—A. W. K. DE JONG. *Rec. Trav. Chim. Pays-Bas*, 58 (1939), 107; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 611. (S. W. G.)

Cocaine, Novocaine and Stovaine—Microchemical Tests for. A critical study of the existing microchemical tests for cocaine, novocaine and stovaine is presented. By the use of Wagenaar's reaction, novocaine can be detected with a sensitivity of 1:3000. A new reagent $RhCl_3.KI$ permits identification of cocaine and stovaine with a sensitivity of 1:10,000. The use of K_2PbI_4 in the identification of these alkaloids is also given.—A. MARTINI and J. C. BARO GRAF. *Mikrochemie*, 26 (1939), 233–240. (R. H. B.)

Colchicine—Spectral and Physicochemical Properties of. By potentiometric titration on a 2.10^{-5}% solution using an antimony electrode three dissociation constants were obtained: 1.8, 7.2 and 10.3. While colchicine is a phenanthrene derivative of the morphine group of alkaloids, from a spectral standpoint it is rather close to that of a phenanthrene quinone; on the other hand it offers some analogies of aspect with the spectra of bodies rather removed from a chemical point of view as certain hydrocarbons of anthracene or pyrene nuclei as well as benzopyrene, methylcholanthrene and especially benzanthrene. These spectral analogies are interesting because of the comparison between the biological properties of colchicine and those of the cancerogenic hydrocarbons.—HENRIETTE SCHUHLER. *Compt. rend.*, 210 (1940), 490. (G. W. H.)

Ephedrine with Silver Preparations—Study of. The literature has little information about the use of ephedrine with silver preparations. Ephedrine hydrochloride and sulfate have been commonly dispensed by physicians in combination with silver proteinates for the bactericidal action of silver and the vasoconstrictor effect of ephedrine. This investigation was concerned with the solutions of ephedrine and its salts with silver preparations and with the preparation of silver salts of ephedrine. Experimental work is reported and discussed and some conclusions drawn. Ephedrine alkaloid in aqueous solution reduces silver salts to metallic silver. The salts do not have the reducing property of the alkaloid. The alkaloid or the sulfate appeared stable in solution with colloidal silver chloride. A colloidal solution of ephedrine silver nitrate apparently was stable. Ephedrine phosphate and silver phosphate in strongly acid solution apparently were stable. No chemical compound was produced; each phosphate was isolated and identified. Attempts at preparation of several compounds failed. Ephedrine hydrochloride apparently was converted into pseudoephedrine by the reaction of silver nitrate in alcoholic solution. A mixture of ephedrine and silver tartrate was obtained that apparently was stable in aqueous solution. When analyzed it showed 10.5% silver and was a mixture of ephedrine nitrate and silver tartrate.—D. J. MCLEOD and H. G. DEKAY. *Jour. A. Ph. A.*, 29 (1940), 277. (Z. M. C.)

Ergot Preparations—Evaluation of. The following method of evaluation of the fluidextract was employed: Evaporate 20 Gm. of the fluidextract to 10 Gm. on a water bath, transfer to a separatory funnel, wash the evaporating dish with 2 x 5 cc. of official sodium hydroxide and once with 5-cc. water; dissolve 6 Gm. of sodium chloride in the united liquids in the separatory funnel and shake three times with 50-cc. ether for 1 minute. Evaporate the united ether extracts on a water bath to 30 cc. and extract this solution with 20, 20 and 15 cc. portions of 2% tartaric acid solution. Expel the ether from the acid solution by shaking the flask in a hot water bath, cool, make alkaline with ammonium hydroxide very carefully. After the first precipitation of the alkaloids, add 2–3 drops of ammonia so that red litmus paper is turned only slightly blue. After standing for 12 hours (preferably in a refrigerator) filter the solution through a funnel provided with a cotton plug into a tared vessel and wash until the weight of the liquid equals 60 Gm. (equivalent to a 3-fold dilution of the ergometrine (1)). Dissolve the residue on the cotton plug by dropping on it hot tartaric acid (2%) and then dilute to 60 Gm. by washing (equivalent to the insoluble bases (II) diluted three times). Treat 2 cc. of I and II with 4 cc. of reagent and compare the blue color arising after 15 minutes colorimetrically. The reagent consists of 100-cc. sulfuric acid (65%) (by vol.), *p*-dimethylaminobenzaldehyde 0.2, solution of ferric chloride 1 normal drop. For the evaluation of the powdered drug the following procedure is recommended: Place 30 Gm. of the powdered drug in a separatory funnel stoppered with a small cotton plug and tared and extract completely by percolation with petroleum ether. After running out, add 150 Gm. ether, 2.0 Gm. ammonia solution, 1 Gm. heavy magnesium oxide and extract with vigorous shaking for 2 hours. Pour off 100 Gm. of the ether solution (= 20 Gm. of the drug) through 4 folds of muslin, evaporate to 75 cc., extract with 20-, 20- and 15-cc. sulfuric acid (2%) successively, evaporate the ether from the solution, make alkaline with ammonia and proceed as with the fluidextract. Quite often the sulfuric acid extracts are slightly turbid and, upon making alkaline, do not yield flocculent precipitates of the insoluble bases but only strongly opalescent turbidity which does not subside. This may be remedied by shaking out the weak ammoniacal solution once with 100 cc. and 50 cc. of ether. Evaporate and dissolve the residue in 30 cc. of 2% tartaric acid solution; make the acid solution slightly alkaline with ammonia whereby the insoluble bases precipitate satisfactorily. This precipitate is allowed to stand 12 hours, collect on a cotton plug, unite the solution with the portion of the ether extract containing the ergometrine and by washing make up to the proper dilution. The residue is dissolved as above by hot 2% tartaric acid to 60 Gm. (equivalent to the solution of the insoluble bases diluted three times. Tables of results are offered.—GERHARD SCHUMACHER. *Deut. Apoth. Ztg.*, 55 (1940), 312–314. (H. M. B.)

Euquinine and Aristochine—Titration of. The reactions involved in these titrations are discussed. —N. SCHOORL. *Pharm. Weekblad*, 76 (1939), 1513. (E. H. W.)

Fumariaceous Plants—Alkaloids of. XXVII. A New Alkaloid, Cheilanthifoline, and Its Constitution. Cheilanthifoline is the name now given to alkaloid F13. On methylation it has yielded sinactine and on ethylation it has yielded an *o*-ethyl ether (m. p. 144° C.), which on oxidation gave rise to 6-methoxy-7-ethoxy-1-keto-1:2:3:4-tetrahydroisoquinoline. Cheilanthifoline is therefore 2-*o*-desmethyl-sinactine. Further evidence has been adduced to show that alkaloid F36 is in fact a partly racemic sinactine.—RICHARD H. F. MANSKE. *Can. J. Research*, 18 (1940), 100–102. (W. T. S.)

Quinine Content of Quinine Salts—Determination of, in Drug Mixtures. The acidimetric procedure of the Hungarian Pharmacopœia IV is suitable for quinine sulfate even in mixtures of drugs. Presence of organic acids (*e. g.*, phenylcinchonic, acetylsalicylic acids and their salts) interferes with the

method.—F. SZEGHÖ. *Magyar Gyógyszerésztud Társaság Ertesítöje*, 14 (1938), 646–649; through *Chimie & Industrie*, 42 (1939), 114. (A. P.-C.)

Quinine Sulfate U. S. P.—Assay of. Determination of the moisture content of quinine sulfate, U. S. P. XI, was found to vary within the range of 3.92–4.77%. When assayed according to the present N. F. procedure for quinine sulfate, using a 0.1-Gm. sample and extracting promptly after complete solution, the results varied from 97.81 to 104.56%, the average for the several findings being 99.95%. Using the same method of assay as described in the N. F. VI, results varying from 96.58 to 102.05% were obtained, the average of the findings being 99.99%. The results and comments of six investigators are tabulated.—REPORT OF THE SUBCOMMITTEE ON ALKALOID AND DRUG STANDARDS. *Proceedings, American Drug Manufacturers Association, Twenty-ninth Annual Meeting*, May (1940), 121–124. (N. L.)

Stemona Tuberosa—Alkaloids of. II. Tuberostemonine. The alkaloid, tuberostemoine, has been isolated from *Stemona tuberosa* Loureiro (*J. Pharm. Soc. Japan*, 54 (1934), 96). Tuberostemonine was found to form a perchlorate, $C_{22}H_{33}O_4N.HClO_4$, melting at 242°, and a hydrobromide, $C_{24}H_{33}O_4N.HBr.3H_2O$, melting at 120°. The free base does not contain a phenolic hydroxy group; it gives a negative Zerewitinoff test for active hydrogen and does not give tests for methoxy and CH_3-N groups. It possesses a lactone grouping but does not react with reagents for the carbonyl group. It forms a methiodide, $C_{22}H_{33}O_4N.CH_3I.H_2O$, decomposing at 236–238°, a quaternary methyl chloride, $C_{22}H_{33}O_4N.CH_3Cl.2H_2O$, melting at 172° and a methyl sulfate salt, $C_{22}H_{33}O_4N.(CH_3)_2SO_4$, decomposing at 253°. When the free base is heated with acetic anhydride, a neutral, amorphous substance is obtained which gives a positive Ehrlich test in the cold, but on acetylation the amorphous substance was recovered unchanged. When heated with 30% sulfuric acid or concentrated hydrochloric acid, the free base is not attacked, but on dry distillation with zinc dust it gives a pyrrole-like substance. When the free base is oxidized with silver oxide, a neutral product, $C_{22}H_{29}O_4N$, melting at 178°, is obtained; this showed the presence of a lactone group and gave a positive Ehrlich test. It is believed that the base, $C_{22}H_{33}O_4N$, is identical with the alkaloid, $C_{22}H_{33}O_4N$, melting at 86–87° and previously isolated from *Stemona sesselifolia*. It is indicated that while the base obtained from *Stemona sesselifolia* was capable of being catalytically hydrogenated and of giving a crystalline dehydrogenation product (using iodine or methyl iodide), tuberostemonine could not be hydrogenated catalytically and its dehydrogenation product is amorphous.—HEISABURO KONDO, KOHEI SUZUKI and MASAKICHI SATOMI. *J. Pharm. Soc. Japan*, 59 (1939); 443–457 (in German, 177–186). (N. L.)

Strychnine—Colorimetric Determination of. The authors have evolved a rapid method for the determination of strychnine in nux vomica and its preparations. The total alkaloids are liberated by the addition of piperazine to the powdered seed, followed by extraction with boiling tetrachlorethylene. The alkaloids are transferred to dilute sulfuric acid and the strychnine isolated by the addition of $K_4Fe(CN_6)$; precipitation is rendered strictly quantitative by the addition of oxalic acid, followed by momentary freezing. The precipitate is heated with concentrated hydrochloric acid and made up to a known volume. An aliquot portion is reduced by zinc amalgam and an aqueous solution of $NaNO_2$ added. The red color obtained is matched in a Lovibond tintometer and the readings obtained correlated with previously obtained values for strychnine. In the assay of nux vomica preparations the initial extractions are carried out with chloroform after preliminary treatment with alcoholic KOH.—J. ALLEN and N. L. ALLPORT. *Australasian J. Pharm.*, 21 (1940), 727. (A. C. DeD.)

Theophylline-Papaverine. Consideration of the fact that alkyl xanthine derivatives behave as acids and that papaverine is definitely basic led the author to try combining the two substances. The curve of the temperature at which turbidity occurs on cooling fused mixtures of varying proportions indicated that a molecular association occurred corresponding to a mixture of 35% of anhydrous theophylline and 65% of papaverine. The compound is prepared by melting slowly, on an oil bath, 33.9 Gm. of papaverine and 18 Gm. of theophylline. The product is a dense glassy mass more or less tinged with yellow. Reduced to powder and kept in a desiccator it loses its initial resinous aspect. It is very slightly soluble in cold water, but dissolves in boiling water with partial decomposition. It is slightly hygroscopic and in the presence of much water tends to separate into its components. It is very slightly soluble in ether, acetone, light petroleum and benzol, but dissolves easily in ethyl alcohol. It melts at 212° and shows all the reactions characteristic of its components.—A. MOSSINI. *Boll. chim.-farm.*, 78 (1939), 261; through *Quart. J. Pharm. Pharmacol.*, 12 (1939), 608. (S. W. G.)

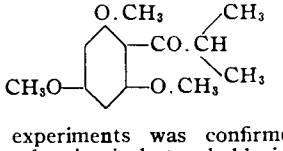
Yohimbine—Note on the Microchemistry of. Yohimbine in chloralhydrate solution warmed on a slide with a particle of KCN produces characteristic feathery crystals easily identified under low power microscope. A sensitivity of 1:5000 is attainable.—A. MARTINI. *Mikrochemie*, 26 (1939), 227–232. (R. H. B.)

Essential Oils and Related Products

Essential Oil of Inhamui. Inhamui is a lauraceous tree found in the Amazon region. Its other botanic names are *Acroclidium elæophorum* and *Nectrandra oleophorum*. The oil is extracted by distillation of the wood, in the presence of water, and by perforation of the trunk in the manner in which oil of copaiba is obtained. Chemical analysis indicates: α-pinene 48.2%, limonene 2.5%, terpinolene 7.4% and α-terpene 2.5%. The residue consists of ethers and organic peroxides, with some resinous material. Oil is of immense value in industry, hence this plant should be developed.—ANTENOR MACHADO. *Rev. soc. brasil. quím.*, 8 (1939), 7. (G. S. G.)

Essential Oils—Rarer, and Their Application in Perfumery. Source, and physical and chemical characteristics of aeolanthus, aframomum, ageratum, angelica, basil, araucaria, calamus, calythrix, tetragona and cardamom oils are given.—ALFRED WAGNER. *Soap, Perfumery and Cosmetics*, 12 (1939), 685; through *Chem. Abstr.*, 34 (1940), 2534. (F. J. S.)

Eucalyptus Conglomerata—Oil of. The authors describe the isolation from the oil of *E. conglomerata* of a new ketone, for which they propose the name conglomerone. This compound is a white crystalline solid of melting point 62–62.5°, and the structure given herewith, which was indicated by a series of



degradative experiments was confirmed by its synthesis after heating isobutyryl chloride with trimethyl phloroglucinol in carbon disulfide solution, in the presence of ferric chloride.—LAHEY and JONES. *University of Queensland Papers*, (1939),

No. 12; through *Chemist and Druggist*, 132 (1940), 215. (A. C. DeD.)

Eucalyptus Oil—Indian. The desirability of reducing the cineol content of eucalyptus oil from 70% to 55%, and introducing the change in the next edition of the British Pharmacopœia, has been suggested by the Indian Chemical Manufacturers' Association to the British Pharmacopœia Commission. The higher standard, the Association states, has been a severe handicap to development of the eucalyptus oil industry in India, and precludes manufacturers of pharmaceutical preparations in that country from using the Indian eucalyptus oil in the preparations of B. P. products.—ANON. *Chemist and Druggist*, 133 (1940), 112. (A. C. DeD.)

Helichrysum Angustifolium Oil. Fresh flowers of *Helichrysum angustifolium*, collected in Provence, yielded 1% of a concrete oil by extraction with petroleum ether. This concrete was chestnut-yellow in color and had a strong, distinctive odor. The acid and ester values were determined by titration in Wood's light in the presence of methyl-umbelliferone as fluorescent indicator. Extraction of the concrete with ethyl alcohol gave the absolute oil in 85% yield, while distillation under reduced pressure in the presence of water vapor yielded 4.9% of a rather viscous essential oil in which eugenol, acetic acid, caprylic acid and an azulene type sesquiterpene were identified as constituents.—S. SABETAY. *Ann. chim. anal.;* through *Chemist and Druggist*, 133 (1940), 106. (A. C. DeD.)

Luminescence (Fluorescence) of Essential Oils in Filtered Ultraviolet Light. Of 252 compounds 160 showed a more or less violet luminescence, 37 a bright violet, 22 a pale greenish, 10 a bright white-green, and 10 a bright yellow-green color. Groups examined are alcohols, aldehydes, ketones, esters, ethers, acetals, lactones, phenols, N compounds, hydrocarbons, acids and 2 halogen compounds. The various groups are classified according to the nature of the luminescence.—ARNO MÜLLER. *J. prakt. Chem.*, 154 (1940), 209; through *Chem. Abstr.*, 34 (1940), 2536. (F. J. S.)

Mayur Pankhi Oil (Thuja Orientalis)—Refining of. Distillation of a mixture of water and the sawdust of the wood of the Mayur Pankhi tree yields an orange-colored oil, used to scent tobacco. It is insoluble in 70% ethyl alcohol and quite different from the ordinary oils of *Thuja*. Neither norite char, Tornico earth nor acid solutions of permanganaten or persulfate improved the color, but an acid solution of perborate was partially successful. The yield, color and odor are satisfactory when steam- or vacuum-distillation methods are used, but steam distillation is expensive and time-consuming. The properties of the original and the vacuum-distilled oils (b_{49-39} 160–205°) are, respectively—d_{30}: 0.9774, 0.9598; $(\alpha)_D^{25}$: −12.9, −20.9; n_D^{35}: 1.5030, 1.5000; acid value: 21.0, 19.8; ester value in terms of MeOAc: 2.96, 2.96; color (determined with the Lovibond tintometer): yellow 3.5, red 0.6 and yellow 0.5, red 0.0.—S. N. GHATAK and K. C. MUKHERJI. *J. Sci. Tech., India*, 4 (1938), 39; through *Chem. Abstr.*, 34 (1940), 2535. (F. J. S.)

Moroccan Roses—Dry. Steam distillation of dry Moroccan roses gave a 0.03% of a green essential oil, solid at ordinary temperature and having the following constants: specific gravity at 15° C., 0.8628; optical rotation, 0°; refractive index at 25° C., 1.4627; freezing point, 27° C.; melting point, 28.7° C.; acid value, 19.6; ester value, 35.07; ester value after formylation, 68.74; rhodinol, 19.80%. On treating with petroleum ether (boiling from 62° to 70° C.) the oil yielded a very dark green, semisolid concrete with: acid value, 18.2; ester value 64.4; melting point (Pohl), 46° to 47° C. Treatment of the concrete by the usual method gave a viscous, very green absolute with acid value 28 and ester value 70. Steam distillation at atmospheric pressure of 3 kilos of the solid oil, with cohobation for 4 days, yielded 31.5 Gm. (1.05%) of green essential oil, having the following characteristics: specific gravity at 15° C., 0.8666; optical rotation at 20° C., −0° 20′; refractive index at 20° C., 1.4637; freezing point, 11° C.; acid value 16.8; ester value, 39.2; ester value after acetylation, 129.06; ester value after formylation, 105.21; rhodinol, 30.90%; reduces ammoniacal silver nitrate; on oxidation, 1 cc. of the oil requires 1.3 cc. of half-normal potassium hydroxide. The oil contains 26.8% stearoptenes (Gildemeister's method). The following were found in the oil: eugenol, pelargonic and phenylacetic acids, probably nonanal, benzaldehyde, geraniol and rhodinol.—G. IGOLEN. *Parf. France Rev. Marques*, 17 (1939), 175–176. (A. P.-C.)

Oil of Amendoin for Oil of Amendoas. A misprint reported work on oil of amendoin (peanut oil) in place of oil of amendoas (oil of almond). Comparative studies were made on several samples of the two oils as to: color, purity, odor, taste, index of refraction and for adulteration with paraffin, cottonseed and other common oils. Almond oil is more likely to be adulterated.—MARIA C. T. T. GRILO. *Noticias farm.*, 5 (1939), 212. (G. S. G.)

Oil of Star Anise. A discussion of the botany, cultivation, harvesting, yield, drying and distillation of oil of star anise. The yield of oil is 2.5% to 3% of fruit dried 48 hours; 8% to 9% of fruit dried 60 hours. Oil of star anise leaf is discussed.—E. GUENTHER. *Am. Perfumer*, 41 (1940), No. 3, 37–41. (G. W. F.)

Sandalwood Oil. Oils coming from three distinct botanical sources are met with in commerce under the name of "Sandalwood Oil." The first is the East Indian, distilled from the heartwood and roots of *Santalum album* L., indigenous to the Mysore district and the Dutch East Indies. The bulk of this oil is distilled in Mysore, but a small amount of very fine quality is distilled in England. The second, in order of importance, is the West Australian, distilled from the wood of a closely related plant, *Eucarya spicata* (R. Br.) Sprague and Summerhayes (*Santalum spicata* A. Sc.). This oil rather closely resembled the East Indian oil both chemically and in odor, but the odors of the two oils are not identical. The third is the West Indian oil, which is obtained from quite a different botanical source, *Amyris balsamifera* L., a tree belonging to the family *Burseraceæ*. The trees from which the East Indian and West Australian oils are won belong to the family *Santalaceæ*. The West Indian oil is unimportant.—ANON. *Indian and Eastern Chemist*, 21 (1940), 46. (A. C. DeD.)

Terpeneless and Sesquiterpeneless Essential Oils. A review is given.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 280. (A. C. DeD.)

Turpentine Oils, Especially German Oil. Five foreign oils and 5 German oils were examined for color, odor, density, optical rotations, miscibility with alcohol, potassium hydroxide test, benzidine reaction, residue upon evaporation, solubility of this residue in acetic acid and fractions upon distillation.—W. PEYER. *Deut. Apoth. Ztg.*, 54 (1940), 911–913. (H. M. B.)

Volatile Oils—Determination of, in Vegetable Drugs. Dr. H. J. van Giffen, chief chemist of the Netherlands Pharmaceutical Association, offers several criticisms and suggestions regarding the so-called "oven method" proposed by Goldberg, Snyder, Wirth and Gathercoal (*Jour. A. Ph. A.*, 27 (1938), 385). These remarks are discussed by Dr.

E. H. Wirth, one of the authors of the original article, and further comments are added by Dr. van Giffen. The discussions call attention to the many unsolved problems and to the difficulties involved in the quantitative determination of volatile oil in vegetable drugs.—H. J. VAN GIFFEN. *Pharm. Weekblad*, 76 (1939), 189; and E. H. WIRTH and H. J. VAN GIFFEN. *Ibid.*, 77 (1940), 367.

(E. H. W.)

Glycosides, Ferments and Carbohydrates

Amelanchier Vulgaris Moench—Study of Heterosides of. The young branches (1 year) of *A. vulgaris* Moench, var. *genuina* R. and C. contain, when first taken up, piceoside and principally amygdonitrileglucoside. In the two-year-old branches the amygdonitrileglucoside content is lower while the piceoside content is higher. The four- to six-year-old barks contain only piceoside. This variety is very similar, with regard to its cyanogenetic glucosides, to *A. botryapium*.—J. RABATE and V. PLOUVIER. *J. pharm. chim.*, 30 (1939), 369–373.

(S. W. G.)

Carbohydrate Characterization. I. The Oxidation of Aldoses by Hypoiodite in Methanol. II. The Identification of Seven Aldo-Monosaccharides as Benzimidazole Derivatives. A method has been developed for the hypoiodite oxidation of aldoses to aldonic acids in methanol; and high yields of the potassium or barium aldonates are obtained in one operation by precipitation from the reaction mixture (yield 90% or over, oxidation period 50 to 60 minutes). The condensation of aldonic acids with *o*-phenylenediamine to give 2-(aldo-polyhydroxyalkyl)benzimidazoles has been developed as the basis for a systematic procedure for the identification of seven aldo-monosaccharides in natural products. The chemical and physical properties of the aldo-benzimidazole derivatives have been found to be remarkably superior, from the characterization standpoint, to those of hydrazones and osazones. A description is given of the preparation, properties and use of these derivatives in the characterization of arabinose, galactose, glucose, lyxose (if naturally occurring), mannose, rhamnose and xylose.—S. MOORE and K. P. LINK. *J. Biol. Chem.*, 133 (1940), 293. (F. J. S.)

Carbonic Anhydrase—Factors Affecting the Activity of. Experiments on the purification of carbonic anhydrase have been carried out and the properties of the enzyme preparation studied. Hydration of CO_2 and dehydration of H_2CO_3 are influenced by the enzyme equally. The activity of the enzyme may be inhibited by a series of oxidizing agents and the activity restored by certain reducing agents. The effect of the inhibitors was shown to be the same on both the hydration and dehydration activity. The activity of the enzyme in relation to the hydrogen ion concentration was investigated over a range from p_H 6.1 to 10.1. The rate of hydration by the enzyme was found to be optimal at p_H 8.1. Carbon monoxide at pressures up to 1200 mm. of mercury did not inhibit the activity of the enzyme. In confirmation of others, it was found that sulfide and cyanide are strong inhibitors of the enzyme.—M. KIESE and A. B. HASTINGS. *J. Biol. Chem.*, 132 (1940), 281. (F. J. S.)

Carpotroside, a New Glucoside or Heteroside Isolated from the Seed of Carpotroche Brasiliensis Endl. Oil of *Carpotroche brasiliensis* is used for the treatment of leprosy and skin affections. Extraction of the oil cake with water yields 0.4% of a new glucoside, called "carpotroside," crystalline, colorless, odorless, slightly sweet in taste, soluble in water, insoluble in the ordinary organic solvents, decomposes on heating without melting or subliming. In acid solution it hydrolyzes to give sugar, aldehydes (including benzaldehyde) and a nitro compound. Its ultimate composition is: carbon 50.90%, hydrogen 6.90%, oxygen 33.3%, nitrogen 8.87%. Its molecular weight, determined cryoscopically, is 143.16.—R. DESCARTES DE G. PAULA. *Rev. soc. brasil. quim.*, 7 (1938), 129–140; through *Chimie & Industrie*, 42 (1939), 109. (A. P.-C.)

Dehydrogenases—Note on the Action of Copper and Phenylhydrazine on Certain. By the use of a standard rat liver preparation the relative effects of copper and phenylhydrazine on various oxidative enzymes were studied.—FREDERICK BERNHEIM. *J. Biol. Chem.*, 133 (1940), 485. (F. J. S.)

Esterase from Muscular Tissue. An enzyme exists in beef and other muscular tissues which has the characteristics of an esterase and which still shows marked activity at temperatures below the freezing point of water.—M. B. MATLACK and I. W. TUCKER. *J. Biol. Chem.*, 132 (1940), 663. (F. J. S.)

Glucose and Glucuronic Acid—Studies on the Microquantitative Estimation of. I. A method has been developed for the microestimation of free and conjugated glucuronic acid in the presence of glucose.—SABURO KAKINUMA. *J. Pharm. Soc. Japan*, 59 (1939), 635–647 (in English, 244–247). (N. L.)

Heparinase. The inactivation of heparin by tissue extracts is discussed. The preparation and properties of an enzyme, heparinase, which inactivates heparin are described. The enzyme is prepared from rabbit liver; it is precipitated by half saturation with ammonium sulfate; and its p_H optimum is in the range 5.3 to 6.8—L. B. JAQUES. *J. Biol. Chem.*, 133 (1940), 445. (F. J. S.)

Honey—Mineral Constituents of. IV. Sodium and Potassium. The variations in sodium and potassium contents of Australian, European and North American honeys, which are wide, are tabulated.—H. A. SCHUETTE and W. W. WOESSNER. *Food Research*, 4 (1939), 349–353; through *J. Soc. Chem. Ind.*, 58 (1939), 1287. (E. G. V.)

Pancreatic Amylase—Solubility of, in Some Organic Solvents. The amylolytic activity of materials recovered after treatment of commercial amylopsin with a number of organic solvents has been determined. Ordinary alcohols, esters and ethers when used as solvents do not yield more active amylase preparations. Ethylene glycol and its ether yield slightly more active material. Of all the solvents tried, aqueous acetamide is most selective.—J. LARSEN and C. F. POE. *J. Biol. Chem.*, 132 (1940), 129. (F. J. S.)

Papain and Trypsin—Action of, on Certain Dehydrogenases. The action of papain and trypsin on the succinoxidase, cytochrome-cytochrome oxidase system, choline oxidase, *d*-amino acid oxidase and amine oxidase of rat liver and kidney has been studied. The amine oxidase and the *d*-amino acid oxidase are inactivated much more slowly than the others by both proteinases. The oxygen uptake but not the methylene blue reduction by the succinoxidase is inactivated more rapidly by trypsin than papain. The cytochrome oxidase system is inactivated more slowly than the succinoxidase by the proteinases. The succinoxidase and choline oxidase are inactivated at about the same rate.—FREDERICK BERNHEIM. *J. Biol. Chem.*, 133 (1940), 141. (F. J. S.)

Papain Manufacture in India—Scope for. There is ample scope in India for papain manufacture. With the world demand increasing and the cultivation of the plant which yields it comparatively easy, and sites with requisite conditions of climate and soil numerous, the drug, at its present attractive price, offers promising possibilities for a large scale industry in India.—ANON. *Indian Med. Gaz.*, 75 (1940), 430. (W. T. S.)

Proteolytic Enzymes. Proteolytic enzymes are secreted by all animal and vegetable tissues including bacteria and molds. The new basis of classification comprises: (I) *Proteinases.*—These attack the middle of a peptide chain and hence are also known as "Endopeptidases." These include: (1) pepsin, present in gastric juice; (2) trypsin and chymotrypsin, from pancreatic juice; (3) cathepsin, an intracellular enzyme in liver and kidney tissues; (4) papain, from the fruit of *Carcia papaya*; (5) bromelin, present in the pineapple. (II) *Peptidases.*—This group splits the peptide (—CO.NH—) linkage at the end of the chain and its members are thus called "Exopeptidases," *viz.:* (6) carboxypeptidases, from pancreas, molds and yeast; (7) aminopeptidase, from intestinal mucosa, molds and yeast. (These require one activating group (COOH and NH_2, respectively) near the peptide link.); (8) prolinase and dipeptidase, from intestinal mucosa and yeasts, the latter being also present in liver, kidney and molds. (Two activating groups must be present in the peptide chain for hydrolytic action.) (III) *Prolidase.*—The activity of this group is limited to splitting the amino (—CO.N<) group present when proline forms the peptide linkage.—ANON. *Chemist and Druggist*, 132 (1940), 482. (A. C. DeD.)

Saponins and Sterols. XVI. Conversion of Ursolic Acid into Uvaol. The authors have previously isolated from the leaves of *Arctostaphylos uva ursi* Sprengel, a dihydric triterpene alcohol having the formula, $C_{30}H_{50}O_2$, and which they named uvaol. This same substance was later isolated from *Leucothæ keiskei* Miq. together with ursolic acid. Since uvaol and ursolic acid occur together, the authors believe that uvaol differs chemically from ursolic acid by substitution of a —CH_2OH group for the —COOH group in the acid. This was proved by the reduction of the phenyl ester of ursolic acid, $C_{36}H_{52}O_3$, to uvaol, $C_{28}H_{45}(CH_2OH):(CHOH)$. Uvaol melts at 232–233° and forms an acetate $C_{34}H_{54}O_4$, melting at 157–159°.—KATUYA FUJII and SIGEITI OOSUMI. *J. Pharm. Soc. Japan*, 60 (1940), 178–181 (in English, 71–72). (N. L.)

Saponins—Extraction of, from Vegetable Materials. Vegetable material containing a saponin, such as soap bark, soapwort or soaproot, is extracted with a solvent such as methanol which is substantially free from water, in presence of an alkaline compound such as ammonia (suitably with heating to the boiling point and filtration while hot).—FREDERICK H. WALTZ, assignor to EASTMAN KODAK CO. U. S. pat. 2,172,265, Sept. 5, 1939. (A. P.-C.)

Sarsasapogenin. IV. Further Observations Concerning Sarsasapogenoic Acid and Related Compounds. Spectrographic evidence confirms the previous indications that the anhydrosarsasapogenoic acid contains an α,β-unsaturated carbonyl group and that sarsasapogenoic acid is a non-conjugated carbonyl compound. Desoxysarsasapogenoic acid, anhydrotetrahydrosarsasapogenoic acid, and octahydro-α,α'-difuryl have also been examined and the results are recorded.—L. F. FIESER, E. M. FRY and R. N. JONES. *J. Am. Chem. Soc.*, 61 (1939), 1849. (E. B. S.)

Starch—New Colorimetric Method for the Determination of. A rapid, accurate colorimetric method using the starch-iodine reaction is described. Starch, 0.5 to 1.0 mg., can be estimated and the method when applied to soluble starch, pure natural starches, potato tubers, as well as rice and wheat flours, is very satisfactory.—J. J. CHINOY. *Mikrochemie*, 26 (1939), 132–142. (R. H. B.)

***k*-Strophanthin-β—Manufacture of.** *k*-Strophanthin-β (I) is obtained by treating the glucosides from *Strophanthus kombe* containing greater than 1 molecule of glucose, or crystalline *k*-strophanthoside with enzyme preparations (*e. g.*, yeast) containing α-glucosidase, preferably in presence of a phosphate radical buffer (p_H 6.8) at 30°. After fermentation I is isolated by extracting the aqueous solution (1 volume) with chloroform-ethyl alcohol (1:0.5 volume).—CHEM. WORKS formerly SANDOZ. Brit. pat. 512,998; through *J. Soc. Chem. Ind.*, 58 (1939), 1293. (E. G. V.)

Strophanthus Glucoside—Manufacture of. The preparation of *k*-strophanthoside and its Ac_7 and heptapropionyl derivative, melting at 202–203°, is described. $(PrCO_2)O$ and benzoyl chloride are also used as acylating agents.—CHEM. WORKS formerly SANDOZ. Brit. pat. 511,459; through *J. Soc. Chem. Ind.*, 58 (1939), 1176. (E. G. V.)

Tyrosinase—Effect of, on Blood Pressure of Hypertensive Rats. The injection of tyrosinase into hypertensive rats consistently and markedly lowered the blood pressure, this effect appearing 5 to 15 minutes after intravenous administration. The use in normal animals gave variable results.—HENRY A. SCHROEDER. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 172. (A. E. M.)

Vincetoxin, a Glucoside from Cynanchum Vincetoxicum. A simple method of production and purification of this glucoside is described, similar to that of condurangin. Vincetoxin possesses characteristics quite similar in part to those of condurangin and belongs to the sterol class. It reacts specifically with a new alcoholic ferric chloric sulfuric acid reagent, induces hemolysis (as also the root extract), is only slightly toxic and without cardiac action. In extraction experiments with petroleum ether, chloroform and alcohol, the main portion of the glucoside is found in the chloroform fraction; the petroleum ether fraction contains minimum amounts of a crystalline sterol. Pure vincetoxin shows in many ways properties other than those described by Tanret and Kubler. It is quite probable that the glucoside is not a chemical individual but rather a mixture of several closely related glucosides. The distribution of vincetoxin in the plant appears to extend mainly into the root, rootstock and into seed. The fresh plant parts contain about 0.3 to 0.4% glucoside.—R. GAGER and L. ZECHNER. *Arch. pharm.*, 276 (1938), 431–447; through *Chimie & Industrie*, 42 (1939), 112–113. (A. P.-C.)

Other Plant Principles

α-Amyrin and Ursolic Acid Isolated from the Leaves of Ilex Paraguariensis. An infusion of the leaves of this plant is extensively used in South America as a beverage called maté. From a $HCCl_3$ extraction of the leaves, the writer reports the isolation of α-amyrin and its oxidation product, ursolic acid. This plant is the first of the *Aquifoliaceæ* to yield these principles. Upon examining the properties of ursolic acid the writer is convinced that it is identical with a sterol previously reported by Hanschild to occur in this plant.—JORGE R. MENDIVE. *J. Org. Chem.*, 5 (1940), 235–237. (W. T. S.)

Carotenoids—Extracting. A material such as macerated fresh carrots is digested with alkali under superatomospheric pressure and at a temperature substantially above 100° C. and the pressure is then rapidly released and the digested material is subjected to solvent extraction (suitably with "mineral spirits") for removal of carotenoids.—DAVID D. PEEBLES. U. S. pat. 2,170,872, Aug. 29, 1939. (A. P.-C.)

Chih-Shih—Constituents of. Hesperetin has been isolated from the Chinese drug "Chih-Shih" (*Citrus fusca* Lour, *Rutaceæ*). The literature on the various

derivatives of hesperetin is also reviewed.—LIANG-CHI WAUNG. *J. Pharm. Soc. Japan*, 60 (1940), 420–423 (in German, 164–168). (N. L.)

Corn Poppy—Constituents of. Phytochemical investigation of the flower of the corn poppy indicates the unsaponifiable portion to be a mixture of an alcohol, $C_{26}H_{54}O$, and a series of paraffin hydrocarbons. The hydrocarbon, $C_{27}H_{56}$, was prepared in a pure state by chromatographic methods and identified by X-ray examination. No stearin was found. The saponifiable fraction yielded palmitic, stearic and oleic acids; an acid, $C_{20}H_{40}O_2$, is probably also present.—L. SCHMID and W. HOSSE. *Mikrochemie*, 26 (1939), 59–66. (R. H. B.)

Deguelin—Method for Determining, in Derris and Cubé. A method for isolating and determining deguelin in derris and cubé is proposed. After the rotenone and the aqueous alkali-soluble materials have been removed, the remaining resin is treated with dilute methanolic alkali. The resulting racemic deguelin is crystallized from carbon tetrachloride and weighed as a 1 to 1 solvate. The purity of the solvate is determined by the Goodhue red-color test. The amount of deguelin in different samples of derris and cubé varies greatly. Eight out of the thirteen samples that were analyzed contained less than 1%. One sample of derris contained 3.9% and one gave the low value of 0.24%. The samples of cubé examined varied in deguelin content from a high of 2.3 to a low of 0.25%. The high toxicity to insects of the non-crystalline portion of derris and cubé extracts, coupled with a generally low deguelin content, suggests the presence of other unidentified compounds that contribute to the toxicity.—L. D. GOODHUE and H. L. HALLER. *Ind. Eng. Chem., Anal. Ed.*, 11 (1939), 640–642. (E. G. V.)

Flavin—Obtaining Crystalline, from Eremothecium Ashbylli. The crystalline flavin compound is obtained by extracting the pigment from the culture medium by shaking in 50% methanol for 2 hours. The extract is left in a bath at 37° C. for 48 hours, filtered and the filtrate treated with chloroform. The chloroform layer is separated out and the alcohol distilled *in vacuo*. The aqueous flavin solution, acidified with acetic acid, is shaken with franconite. When the adsorption of the flavin is complete, elution is accomplished with a mixture of 2 parts of water, 1 part of alcohol and 1 part of pyridine. The solution is concentrated *in vacuo* and the residual aqueous solution is made slightly acid, is added to lead acetate and subjected to a current of hydrogen sulfide. The flavin is adsorbed by the lead sulfide in the proportion in which it forms. After washing with cold water, it is mixed several times with boiling water. These procedures are repeated 4 or 5 times. When the last washing is completed, the material is concentrated *in vacuo* to a small volume. The flavin precipitates out forming a yellow-orange crystalline powder. It is recrystallized several times from hot water and dried in a desiccator. The adsorption of flavin by franconite is rapid, quantitative and free from impurities.—A. MIRIMANOFF and MLLE. A. RAFFY. *Helv. Chim. Acta*, 21 (1938), 1004–1006; through *Chimie & Industrie*, 42 (1939), 118. (A. P.-C.)

Forsythin—Isomer of Phillyrin (Philyroside). A review of the literature regarding forsythin and phillyrin (philyroside) and an investigation of the constitution of forsythin.—TENMIN KAKU, H. P. and N. HARA. *J. Pharm. Soc. Japan*, 59 (1939), *Transactions*, 248–255 (in German). (N. L.)

Geranium Onoei—Constituents of. Maceration of the entire plant of *Geranium onoei* Franch. et Sav. with methanol, followed by concentration of the extracts, gave a residue which was taken up with warm water. After cooling, the solution was filtered and the filtrate extracted with ether. Removal of the solvent gave a residue which after treatment with a solution of sodium bicarbonate and then with ether gave quercetin and the methyl ester of gallic acid. Gallic acid was also isolated from the sodium bicarbonate extracts. Further extraction of the aqueous portion with ethyl acetate gave tannic acid.—FUKUJIRO FUZIKAWA and MANJI INA. *J. Pharm. Soc. Japan*, 60 (1940), 125–127 (in German, 30). (N. L.)

Helenium—Constituents of Certain Species of. II. Tenulin. *Helenium macrocephalum* has been found to contain helenalin. *Helenium tenuifolium*, *H. elegans* and *H. badium* contain a hitherto unrecorded compound, $C_{17}H_{22}O_5$, which has been designated tenulin. Some derivatives of tenulin have been prepared which suffice to establish definitely the molecular formula given for tenulin and at the same time show that the compound obtained from *H. tenuifolium* and reported by Buehler, Whitehead and Goodge is isotenulin. In one lot of *H. tenuifolium*, another new substance, $C_{16}H_{22}O_5$, was isolated. Several derivatives of this material have been prepared. A diagram showing the relation between the various compounds and their origin is presented. —E. P. CLARK. *J. Am. Chem. Soc.*, 61 (1939), 1836. (E. B. S.)

Lactuca Virosa—Bitter Principles of the Latex of. IV. An attempt was made to determine colorimetrically the presence of bitter principles in the fresh latex without first isolating the pure substances. Especially suitable is the reduction of the bitter principles with zinc and HCl; 1 mg. of lactucin gives a beautiful red color. Lactucopicrin also gives a red color but only at essentially higher concentrations. If a solution of lactucin or of lactucopicrin is allowed to stand with KCN and NaOH in the dark for a long time, the solution assumes a weak, yellow-green color and gives an intensive blue fluorescence. The reaction is not specific for either of the bitter principles but permits the detection of a few gamma of these substances and the measurement of the whole content in bitter principles in agreement with taste analysis.—G. SCHENCK. *Arch. pharm.*, 277 (1939), 132–135. (L. K.)

Lentinus Tuber-Regium—Constituents of. *Lentinus Tuber-regium* Fr. is widely distributed over Japan as an imitation of the drug "Bukuryo" (*Poria cocos* Wolf). *Lentinus Tuber-regium* is white and does not react with iodine-potassium iodine solution whereas *Poria cocoa* possesses a light brown to light red color and reacts with iodine-potassium iodide solution to give an intensive red color. From the ethereal extract of *Lentinus Tuber-regium*, a sterol and a wax (melting at 80°) are obtained in small yields. The sterol, $C_{27}H_{46}O_3$, recrystallizes from methanol to give white needles, melting at 112°; easily soluble in ether and petroleum ether; soluble in methanol and alcohol; insoluble in water. It turns an intense violet to green color with acetic anhydride and concentrated sulfuric acid (*Liebermann's reaction*) and does not react with bromine in glacial acetic acid.—SOKICHI NAKANISHI, MITIKO YAMAMOTO and TIE NAKUMURA. *J. Pharm. Soc. Japan*, 59 (1939), 730–731 (in English, 276–277). (N. L.)

Myristicaceæ—Tannin-Mucilage Complex in Certain. The author reports that in the stems of *Myristica fragrans* Houtt. and *M. fatua* Houtt. the symplast-secreting phloem and circummedullary contain at the same time a tannin compound analogous to kino and a pectosic mucilage. These two substances form a complex insoluble in water, strong alcohol and a 0.2% alcoholic solution of sodium hydroxide. A similar mucilage-tannin complex was found in numerous conducting vessels of the secondary wood of these two species.—R.

LEMESLE. *Bull. sci. pharmacol.*, 46 (1939), 272–274. (S. W. G.)

Nephromopsis Stracheyi—Constituents of. III. Investigation of a substance, "B-acid," isolated from *Nephromopsis stracheyi var. ectocarpisma* Hue was made. By means of chromatographic methods, *l*-protolichesterin acid, m. p. 103–106°, $[\alpha]_D^9$ = 12.4°, was obtained. When treated with diazomethane, this acid gave a pyrazolin derivative of the formula, $C_{21}H_{36}O_4N_2$, m. p. 60–61°, $[\alpha]_D^{13}$ = 288.2°.—MITIZO ASANO and MASAMI TANIGUTI. *J. Pharm. Soc. Japan*, 59 (1939),542–546 (in German, 216). (N. L.)

Ononis Spinosa L.—New Constituent of the Root of. Steam distillation of the cut drug and salting out and extracting the distillate with ether gives a dark brown, liquid substance which, after several days' standing, yields white crystals soluble in hot methyl alcohol and insoluble in the cold alcohol. The dark brown, amorphous substance is soluble in the cold alcohol. The white, needle-like, odorless crystals melt at 149°. The new compound has been named spinosin.—F. NEUWALD. *Arch. pharm.*, 277 (1939), 130–132. (L. K.)

Pachymic Acid—New Constituent of "Bukuryo" (Poria Cocos). I. The authors have isolated from the ethereal extract of "Bukuryo," the sclerotium of *Poria cocos* Wolf (*Pachyma Hoelen*, Rumph.), a substance which, after repeated recrystallization from methanol or acetone, gives colorless crystals, melting at 300°. It reacts with acetic anhydride and concentrated sulfuric acid with a color change of red to orange (*Liebermann's reaction*). Analysis shows its formula to be $C_{30}H_{44}O_6$. It is a monobasic acid, has a lactone group and one double bond. It forms an acetyl derivative, $C_{32}H_{46}O_6$, melting at 225°, indicating the presence of an hydroxy group. With diazomethane, it forms a methyl ether, $C_{31}H_{46}O_5$, melting at 175°, which can be acetylated to give the acetyl derivative, $C_{33}H_{48}O_6$, melting at 155°. The authors suggest that the acid be named pachymic acid.—SOKICHI NAKANISHI, MITIKO YAMAMOTO and HUKUKO IKEDA. *J. Pharm. Soc. Japan*, 59 (1939), 725–730 (in English, 273–276). (N. L.)

Pedicinin—Constitution of. On the basis of available data, the structure of pedicinin (the pigment of *Didymacarpus pedicellata*), as given by Sharma and Siddiqui, was criticized. New facts concerning its nature were found and its character as a dibasic acid was definitely proved. Pedicinin undergoes reductive acetylation and yields on catalytic hydrogenation an unstable yellow tetrahydro derivative which readily gives up two hydrogen atoms, forming the stable red dihydropedicinin. Like the parent compound it forms a disodium salt. Evidences, both direct and circumstantial, have been given in support of a new formula for pedicinin which is now considered by the present authors to be a chalkone quinone in preference to its previous representation as 4:5:7-trihydroxy-6-methoxybenzal coumaranone.—PRAFULLA KUMAR BOSE and PHANIBHUSAN DUTT. *J. Indian Chem. Soc.*, 17 (1940), 499. (F. J. S.)

Rosin—Cracking of. Vapor phase cracking of rosin on the laboratory scale is described and the yields of water (0.6–3.9%) and of gaseous and liquid products at 500°, 600° and 700° in presence of reduced copper, aluminum oxide and silica gel are tabulated. The gases (28.5–52.0%) consisted mainly of aliphatic hydrocarbons (C_nH_{2n+2} and C_nH_{2n}), hydrogen, carbon dioxide and carbon monoxide. The amount of distillate (boiling point 30–200°) varied from 11.5% to 22.5% and depended on the rate of delivery of the molten rosin to the cracking tube, the catalyst, etc. The distillate (boiling point greater than 200°) varied from 21.6–41% and contained naphthalene, anthracene, phenanthrene and retene. It is suggested that the phenanthrene and retene are formed by decarboxylation and partial dehydrogenation of the rosin acids followed by fission of their chains. Naphthalene and anthracene, which are observed only at high temperature, are formed by "pyrogenetic synthesis" from aromatic hydrocarbons and ethylenes previously formed during the cracking. The chemistry of rosin and of general cracking processes, and physical and chemical methods for the analysis of gaseous and liquid hydrocarbon mixtures, are reviewed (104 literature references). The following processes have received attention: determination of the olefine content, using mercuric acetate, and bromine value of hydrocarbon mixtures, separation of anthracene and retene by fractional crystallization of their picrates, detection of anthracene by the red color of its picrate. Cracking of rosin oils (obtained by dry distillization of rosin at 350°) gave gaseous and liquid (boiling point 30–200°) fractions similar to those obtained from rosin; carbon dioxide was not, however, evolved and the proportion of light distillate was less.—J. BRODSCHI. *Bull. inst. pin.* (1938), 89–106, 118–145, 159–171, 203–207; through *J. Soc. Chem. Ind.*, 58 (1939), 515. (E. G. V.)

Strophanthidin—Contribution to the Abnormal Dehydrogenation of. 3,5-Dimethyl-, 2-Ethyl-5-Methyl- and 3-Ethyl-5-Methyl-Phenanthrene. Dehydrogenation of strophanthidin with Se has been reported to yield Diels' hydrocarbon and other phenanthrene hydrocarbons depending upon reaction conditions. The present work shows that in addition to the Diels' hydrocarbon only one other is formed during the dehydrogenation, and this appears to be $C_{16}H_{14}$ or $C_{17}H_{16}$, more probably the latter. A rupture of ring IV of strophanthidin during dehydrogenation would lead to a 1,2-dialkyl substituted phenanthrene. All dimethyl-, ethyl- and methyl-ethyl-phenanthrenes substituted in this position have been prepared and the hydrocarbon is known to be none of these. It was therefore concluded that the hydrocarbon is formed by a rupture of the ring plus a rearrangement. The hydrocarbon was not identical with 3,5-dimethyl-, 2-ethyl-5-methyl and 3-ethyl-5-methyl-phenanthrene, which compounds were synthesized by the Pschorr method. This method failed to give 4,5-dimethylphenanthrene which confirms the observation of Haworth and Sheldrick (*J. Chem. Soc.* (1934), 1950) who, from a study of models, predicted the impossibility of forming such compounds by ring closure. The synthesis of the 1-ethyl-5-methyl compound was abandoned because of the high cost of intermediates. A postulation as to the identity of the hydrocarbon is presented. The work is being continued.—ERNEST E. LEWIS and ROBERT C. ELDERFIELD. *J. Org. Chem.*, 5 (1940), 290–299. (W. T. S.)

Temisin. I. Two lactone compounds, temisin, $C_{15}H_{20}O_3$, and dihydro-iso-temisin, $C_{15}H_{22}O_3 . H_2O$, have been isolated from a santonin-free wormseed. Temisin was shown to be a secondary alcohol with two double bonds. On selenium degradation, it forms a 1-methyl-7-ethyl-naphthalin, $C_{13}H_{14}$, boiling point 133–138°/14 mm. Temisin on recrystallization from ethyl acetate or absolute alcohol gives colorless prisms, melting at 228°; $[\alpha]_D^{20}$ = +69.86°. On bichromate oxidation it forms temison, melting point, 131°; $[\alpha]_D^{20}$ = −84.65°. Hydrogenation of temisin, using platinum oxide catalyst, gives colorless needles of tetrahydro-temin, melting point, 231°; $[\alpha]_D^{19}$ = +45.94°. Temison on catalytic hydrogenation gives tetrahydro-temison, melting point, 109.5°; $[\alpha]_D^{23}$ = −63.75°.—YASUHIKO ASAHINA, HARUKITI NAKAMURA and TYUNOSIN UKITA. *J. Pharm. Soc. Japan*, 60 (1940), 204–208 (in German, 72–74). (N. L.)

Veronica Species. An investigation was made of the mannite content of various *Veronica* species (*Scrophulariaceæ*). By digesting the entire plant with methyl alcohol, the extractive matter, after recovery of the solvent, was treated with warm water, filtered and the filtrate reacted with lead acetate solution. The precipitated material was removed by filtration and hydrogen sulfide passed into the filtrate to remove the excess lead acetate. After filtration and concentration of the filtrate, a syrupy residue was obtained. This was recrystallized from alcohol and colorless needles, melting at 166°, separated out. A mixed melting-point determination indicated the product to be mannite. Acetylation of these crystals with acetic anhydride in the presence of sodium acetate gave a product which melted at 123° after recrystallization from alcohol; these crystals were identified as hexaacetylmannite. The original crystals formed triformalmannite, melting at 227° and tribenzalmannite, melting at 224°. The mannite content of the various *Veronica* species investigated is: *Veronica agrestis* L., 0.40%; *Veronica Buxbaumii* Ten., 0.25; *Veronica arvensis*, L., 0.15; *Veronica laxa* Benth., 0.14 (0.90); *Veronica Miqueliana* Nakaj, 0.45; *Veronica serpyllifolia* L., 0.45; *Veronica Stelleri* Pall., 0.40; and *Veronica senanensis* Maxim., 0.74. —FUKUZIRO FUZIKAWA, YUTAKA KUDO and HIRASHI SENGOKU. *J. Pharm. Soc. Japan*, 59 (1939), 611–614 (in German, 241). (N. L.)

Veronica Species—Constituents of. II. A continued study of the mannite content of various *Veronica* species (*J. Pharm. Soc. Japan*, 59 (1939), 611–614 (in German, 241)). The per cent of mannite in the following *Veronica* species investigated is: *Veronica anagallis* L., 0.004 (0.2); *Veronica peregrina* L., 1.13; *Veronica nakaiana* Ohwi, 0.1; *Veronica daisenensis* Makino, 0.27 and *Veronica incana* L., 3.72.—FUKUZIRO FUZIKAWA and KENZI ASAMI. *J. Pharm. Soc. Japan*, 60 (1940), 231–232 (in German, 80). (N. L.)

Fixed Oils, Fats and Waxes

Avocado—Philippine, Use of Fatty Oil from, in Pharmacy. The oil is extracted by mechanical pressing or by extraction in a Soxhlet. Pressing gave 10.03% oil while extraction gave 17.73% oil. Avocado pear oil is reported to contain vitamins A, D and F. There are satisfactory results from its use in cosmetics, creams and soaps.—CLARA H. MANOTOK and PATROCINIO VALENZUELA. *Rev. Filipina Med. Farm.*, 30 (1939), 125. (G. S. G.)

Beeswax—New Process for Refining. India's crude traditional method of refining beeswax by melting, washing and sun bleaching fails to provide a uniform product and has other defects unacceptable to polish manufacturers and other trade users. The authors have described a method of utilizing chemical bleaching agents which is claimed to provide a wax of a texture as good as that of the original wax.—R. L. DATTA and N. N. BOSE. *Indian and Eastern Chemist*, 21 (1940), 38. (A. C. DeD.)

Cod Liver and Linseed Oils—Antimicrobic Action of. Fresh animal and vegetable oils have no antimicrobic action but unsaturated oils (high iodine value) on keeping, and saturated and unsaturated oils after artificial oxidation or aging, are active (*Aspergillus* and *Penicillium* spores).—T. SABALITSCHKA. *Süddeut. Apoth.-Ztg.*, 79 (1939), 672–674; through *J. Soc. Chem. Ind.*, 58 (1939), 1175. (E. G. V.)

Fats—Antioxidants and the Oxidation of. An apparatus for the study of the autoxidation of fats and related materials has been designed to permit the collection and analysis of the various volatile products formed in the reaction, the measurement of the oxygen consumption and analysis of the oxidation residue. Oleic acid, oleyl alcohol, methyl oleate, butyl oleate and *cis*-9-octadecene appear to be autoxidized in a similar manner to yield the same types of products—among others, peroxides, peracids, aldehydes, substituted ethylene oxides, acids, alcohols, combination of these and water. After the addition of oxygen to form peroxides at the ethylene linkage, these peroxides may cleave to give aldehydes; they may react with another double bond to give two moles of ethylene oxide, or they may aid in the further oxidation of the carbon chain. The aldehydes formed also autoxidize to give peracids and acids. The oxygen consumption per mole of double bond destroyed is least for oleic acid, most for oleyl alcohol. The amount of oxygen consumed is about the same for methyl oleate and *cis*-9-octadecene. In each case, about one-fourth of the oxygen taken up appears as water. Oxido derivatives are among the main products of the autoxidation process. When oleic acid is oxidized, oxidoöleic acid does not appear as such but is apparently converted to half esters of dihydroxy stearic acid. The oxido derivatives are all of the same geometrical configuration and correspond in each case to the high-melting dihydroxy isomeric derivative of the original substrate.—F. E. DEATHERAGE and H. A. MATTILL. *Ind. Eng. Chem.*, 31 (1939), 1425–1431. (E. G. V.)

Fatty Acids—Comparative Curative Values of Unsaturated, in Fat Deficiency. Unsaturated fatty acids, linoleic, linolenic, arachidonic and cod liver oil acids, show differences in growth and skin effects. They should no longer be treated as an interchangeable group but should be used individually in nutrition studies.—G. O. BURR, J. B. BROWN, J. P. KASS and W. O. LUNDBERG. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 242. (A. E. M.)

Fatty Acids—Determination of, in Clay Soaps. Description of suitable technique.—O. HAGEN. *Seifensieder Ztg.*, 67 (1940), 72; through *Am. Perfumer*, 41 (1940), No. 1, 67. (G. W. F.)

Fatty Oils—Determination of, Color of. The oil is compared in a comparator with standard solutions made from (*a*) chromium alum and potassium dichromate, (*b*) potassium chromate and (*c*) cobalt nitrate. (*a*), (*b*) and (*c*) are used for brown, yellow and red oils, respectively. The colors of the standard solution do not fade in sunlight or with keeping.—K. OSHIMA and T. SUGAWARA. *J. Agr. Chem. Soc. Japan*, 15 (1939), 653–658; through *J. Soc. Chem. Ind.*, 58 (1939), 1145. (E. G. V.)

Fenugreek Seed Oil. A comparison of various analytical constants. Some new values are included. The separated fatty acids show the following percentages of each: palmitic 7.3; stearic 2.4; arachidic 0.9; behenic 0.6; oleic 21.0; linoleic 37.0 and linolenic 19.—H. A. SCHUETTE, M. A. CROWLEY, H. A. VOGEL and M. M. MUELLER. *Oil and Soap*, 17 (1940), 122; through *Am. Perfumer*, 41 (1940), No. 4, 75. (G. W. F.)

Fish Products—South African. I. Liver Oils from the Stockfish of Hake (Meluccius Capensis Cast), and from the Kingklip or Cape Ling (Genypterus Capensis Smith). A general survey of South African fish products has been undertaken with the object of ensuring their more efficient utilization. Data are recorded with regard to seasonal variations in the percentage yield of oil from stockfish and kingklip livers. Physical characteristics of the livers are recorded, as well as their iodine values and their vitamin A contents. Data with regard to their vitamin D potency and their unsaponifiable matter will be presented later. They have proved superior to cod liver oils in vitamin A potency, and

in the case of the kingklip, liver oils from large fish approach halibut liver oils in potency. Both types of oil are remarkably constant in quality over the greater part of the year, although their vitamin A potency is very greatly reduced during the summer months when the fish are feeding intensively.—C. J. MLLTENO and W. S. RAPSON. *J. Soc. Chem. Ind.*, 58 (1939), 297–298. (E. G. V.)

Grape Seed Oil in Soap Making. Grape seed oil is now being increasingly used on the Continent, particularly in Germany and Italy, as a soap material. In Germany, some 1500 tons of the oil are available per annum. As a by-product of the wine industry, the oil has been known for a very long time but has only recently attracted attention. Freshly expressed grapes yield 25% of seeds, and these contain some 15–20% of oil, which varies from a light yellow to a dark olive-green color, according to the method of production; and there are also variations in the nature of the oil yielded by grapes of different types and grown in different climates. The oil was at one time considered to resemble castor oil in character, but this has now been shown to be incorrect. With an iodine value of 100–135, and a titer of about 20° C., the oil is more similar to soya bean oil.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 106. (A. C. DeD.)

Linoleic Acid of Seed Fats—Constitution of. The yields of crystalline tetrabromostearic acid, melting point 114°, and of the various tetrahydroxystearic acids producible from natural linoleic acid of cottonseed oil, and from the isomeric varieties produced from this acid by chemical means, have been compared. In addition to the natural acid, α- and β-linoleic acids were prepared by debromination, respectively, of the crystalline and of the viscous liquid tetrabromostearic acids which are formed when bromine unites additively with the natural acid; further, the *cis-trans* isomerized linoleic acids produced by the action of 0.3% of selenium at 220° on the α- and β-linoleic acids were also studied. The results confirm the view that natural and α-linoleic acids are stereochemically identical (probably *cis*-Δ^9-*cis*-Δ^{12}-octadecadienoic acid). β-Linoleic acid is more probably a mixture of about equal parts of the *cis*-Δ^4-*cis*-Δ^{12}-acid and the *cis*-Δ^9-*trans*-Δ^{12}-acid, while the isomerized α-linoleic acid apparently consists largely of the *trans*-Δ^9-*trans*-Δ^{12}-form. Alkaline permanganate oxidation of the linoleic acid isomerized by selenium does not produce the tetrahydroxystearic acids, melting point 173° and 157°, which are obtained by similar oxidation of natural linoleic acid, but gives smaller yields of two isomeric tetrahydroxy acids, melting point 144° and 135°. The respective pairs of 9:10:12:13-tetrahydroxystearic acids obtainable from natural and isomerized linoleic acid under different conditions of oxidation show an exact parallelism with the two different 9:10-dihydroxystearic acids produced under corresponding conditions from oleic and elaidic acids.—T. P. HILDITCH and H. JASPERSON. *J. Soc. Chem. Ind.*, 58 (1939), 233–241. (E. G. V.)

Mustard Oils. I. G. Farbenindustrie A.-G., in 4882/1939 open to inspection at the English Patent Office, claim that they have found that mustard oils can be obtained by the treatment of chlorolefines in which a chlorine atom is situated in alpha-position to an olefine double bond in the liquid phase, preferably in aqueous solution, with thiocyanic acid salts. The reaction proceeds with the formation of mustard oils wherein the thiocyano group is attached in the alpha-position with reference to the olefinic double linkage. Chlorolefines suitable for the reaction are, for example, allyl chloride and also its homologs, such as 1-chlor-butene-2, 1-chlor-2-methylbutene-2, and also chlorolefines containing still further chlorine atoms, *e. g.*, 1.3-dichlorpropene-2. Mixtures of such compounds may also be used. The reactivity of the chlorolefines with thiocyanic acid salts is so great that mixtures of chlorolefines with saturated chlorohydrocarbons, such as are sometimes obtained, for example, in the preparation of chlorolefines, may be directly used as initial materials without further purification. The mustard oils formed are insoluble in water and may be easily separated from the reaction mixture by separating off the non-aqueous layer or by extracting the aqueout reaction mixture with an organic solvent such as ether. The mustard oil may be further purified by distillation or steam distillation. The mustard oils thus obtained are industrially valuable intermediate products for the preparation of aliphatic unsaturated amino compounds.—ANON. *Perfumer. Essent. Oil Record*, 30 (1939), 308. (A. C. DeD.)

Myristica Fats—Component Fatty Acids and Glycerides of. The component fatty acids of the kernel fat of Virola nuts were found to be mainly myristic 73% and lauric 15% (wt.), the remainder being palmitic and oleic acids in approximately equal proportions. Crystallization from acetone gave rise to fractions, the component glycerides of which could be determined fairly accurately. The major component glycerides were found to be of the order trimyristin 43%, laurodimyristin 31%, oleolauromyristin 12% and lauromyristopalmitin 10% (mol.). In the same way it has been shown that the chief fatty acids in the kernel fat of *Pycanthus Kombo* were myristic 62% and Δ^9-tetradecenoic (myristoleic) acid 24%. The latter acid (which occurs in small proportions in most fats from aquatic sources and also in cow-milk fat) has not been observed previously in a seed fat, and its presence as a substantial component in *P. Kombo* seed fat is most unusual, so far as our present knowledge goes. The major component glycerides were found to be tetradecenodimyristin 33%, trimyristin 24% and laurodimyristin 17%, together with smaller amounts of myristoditetradecenoin, laurotetradecenomyristin and oleotetradecenomyristin. Both fats had a high free acidity, the unsaturation of which was greater than that of the component fatty acids of the glycerides.—D. ATHERTON and M. L. MEARA. *J. Soc. Chem. Ind.*, 58 (1939), 353–357. (E. G. V.)

Olive Oil—Physical and Chemical Constants of, from Olives at Different Stages of Maturity, of Different Varieties and from Different Localities. The determinations were made on oils pressed from the fruit and separated from the water by a laboratory supercentrifuge separator and clarifier, then filtered. The yellow and blue color, as measured by the Lovibond tintometer, decreased and the red increased with maturity. Specific gravity by pycnometer and Abbé index of refraction showed no consistent change. The Hanus iodine number, saponification number and free fatty acids, determined by A. O. A. C. methods, showed consistent increases, the iodine number as much as from 79.5 to 94.75 and the saponification number, from 190.19 to 197.94. Oils from the same varieties grown in different localities showed consistent values, except iodine and saponification numbers, which varied considerable. There were no clear lines between the values for the oils from the different varieties of fruit.—P. F. NICHOLS and H. FRIAR. *Fruit Products J.*, 18 (1939), 361–364, 375; through *Chem. Abstr.*, 33 (1939), 8431. (E. G. V.)

Paraffins—Natural and Artificial. The following test to distinguish between "natural" and "artificial" soft paraffins is given. Place exactly 1 Gm. of the sample in a glass tube about 1 to 1.5 cm. in diameter and 12 cm. long and graduates in 0.1 cc. to at least 7 cc. from the bottom. Gently warm the tube to melt the sample and get it near the bottom

of the tube. Add exactly 5 cc. of a solvent consisting of equal volumes of carbon tetrachloride and glacial acetic acid, then immediately close the tube with a cork through which a thermometer passes so that the bulb and a portion of the stem are immersed in the liquid. Immerse the tube in water, at about 10° C. above the solution temperature, to a height a little above that of the liquid in the tube and shake the tube until solution is effected. A temperature of 45–55° C. is sufficient for most samples, but occasionally a higher temperature is required. A clear solution will result in a few seconds and the tube is then immersed in the warm water for about five or ten seconds nearly to the top in order to warm the sides, and the tube is rotated rapidly in a slanting position to ensure that any soft paraffin on the sides is dissolved. The tube is then shaken and immersed in water at about 5° C. above the solution temperature which, if necessary, can be determined roughly by allowing the tube to cool in air. The tube is allowed to cool slowly, about 1° C. per minute, and at the first sign of deposition is shaken, keeping it immersed in the water. The deposition temperature, practically the solution temperature, is usually sharply marked by the rapid formation of a heavy deposit. If deposition begins at a high temperature, *e. g.*, about 60° to 70° C., and the precipitate is granular or flaky and forms slowly, the presence of ceresine is indicated. Genuine soft paraffin gives an oily deposit which forms sharply. The deposition temperature is noted and the tube and contents allowed to cool in the water and then to stand securely closed for two or three hours or longer. The volume of the crystalline deposit, if any, is noted. Taking care to avoid shaking, the tube is then immersed in water at 35–40° C. All samples, except those containing ceresine, will clarify at this temperature and with genuine soft paraffins an oily layer, called the upper layer, is observed. The volume of this is noted. Freedom from adulteration with liquid paraffin and hard paraffin is indicated by: (1) a high solution temperature; (2) a low volume of crystalline deposit; (3) a considerable volume of separated upper oily layer. With commercial samples the following may be expected: (1) deposition temperature usually above 35° C.; (2) crystalline deposit not more than 4 cc.; (3) upper oily layer not less than 1 cc.—H. BRINDLE. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 361–79.
(S. W. G.)

Tall Oil. This material, a by-product in the preparation of wood pulp, has been used for soap-making in the countries around the Baltic for some time past, and Germany is reported to have imported as much as 20,000 tons in 1938. Tall oil is a mixture of fatty and resin acids, with a somewhat large proportion of unsaponifiable matter. The fatty acids are mainly oleic, linolic and linolenic acids, and they vary in amount from 35% to 45% in a crude oil, to 55% to 80% in a refined oil; the resin acids vary from 35% to 45% in a crude oil to 12% to 40% in a refined oil, and the unsaponifiable matter ranges from 5% to 10%. Though the crude oil has a dark color and a disagreeable odor, it can be considerably improved both in color and odor by treatment with benzin, or by hydrogenation, and such oil has been used in toilet soaps up to 12% of the stock, while in household soaps 25% is quite unobjectionable.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 211.
(A. C. DeD.)

Turtle Oil—Constituents of. I. The turtle oil used in this study was the oil obtained from *Chelonia mydas* L. of New Guinea. It has a light yellow color and contains a large quantity of solid fatty substance at room temperature, but forms a complete solution when the temperature is raised to 29°. The physical properties of the oil are: specific gravity, $d_4^{15} = 0.9185$; melting point, 29°; solidifying point, 16°; iodine number, 49.9°; rhodan number, 39.9. A mixture of fatty acids obtained by saponification of the oil consisted of a white solid, melting point 27–29°, melting into a light yellow transparent oil; it gave a neutralization number of 217.0 and an iodine number of 51.2. Stearic, palmitic, myristic and lauric acids were isolated from this solid. The fraction containing unsaturated fatty acids gave 9,10-dihydroxy-stearic acid on oxidation with potassium permanganate in the cold. Fractional distillation of the methyl esters of the mixed fatty acids gave caproic acid, 3.5%; lauric acid, 14.2%; myristic acid, 7.2%; palmitic acid, 15.2%; stearic acid, 6.8%; tetradecenic acid, 2.6%; hexadecenic acid, 10.9%; oleic acid, 39.4% and a small amount of a highly unsaturated fatty acid. Two glycerides, dipalmitostearin, melting point 56.5°, and myristodipalmitin, melting point 52°, were isolated. Phosphatide was absent. From 4 Kg. of turtle oil, 15 Gm. of unsaponifiable substance were obtained. Recrystallization of this substance from acetone gave needles melting at 145–146.5°. This was shown to be cholesterol.—AKIRA OGATA and AKIRA MINATO. *J. Pharm. Soc. Japan*, 60 (1940), 191–204 (in English, 76–80). (N. L.)

Unsaponifiable Matter—Simplification of the Continuous Extraction Method for the Determination of. In the continuous method, the amount of soap carried over in the extract is so small that washing with dilute ethyl alcohol (which induces hydrolysis) is superfluous; the petroleum solution of the unsaponifiable matter from the extraction should be evaporated, and the dry residue taken up in light petroleum, filtered, reëvaporated and weighed. Titration of fatty acids in the residue is not needed as the correction is negligible. Results so obtained on various fats agree well with the figures obtained by the A. O. C. S. official method (shake-out extraction with fatty acid correction).—R. H. ROGERS. *Oil & Soap*, 16 (1939), 127–128; through *J. Soc. Chem. Ind.*, 58 (1939), 963. (E. G. V.)

Vegetable Oils—Determination of Sediment in, with the Aid of a Centrifuge. Operating details are given. Presence of water does not affect the determination of sediments in flax and cottonseed oils, but gives high values for sunflower oil.—E. A. MIRER. *Vsesoyuz. Nauch.-Issledovatel. Inst. Shirov* (1936), 62–86; through *J. Soc. Chem. Ind.*, 58 (1939), 1145. (E. G. V.)

Vegetable Oils—Oxidation of, at High Temperatures. I. Oxidation of Cottonseed and Dracocephalus Oil. The oils are heated at 100–800° in a current of air. For both oils a rapid increase in free carboxy, aldehyde, hydroxy and peroxide groups is observed as the temperature exceeds 300°. A fall in carboxy and aldehyde groups is observed at 600° and in peroxide groups at 500–600°.—A. K. PLISOV and V. I. KOMPANEETZ. *J. Applied Chem. Russ.*, 12 (1939), 934–943; through *J. Soc. Chem. Ind.*, 59 (1940), 60. (E. G. V.)

Ximenia Oil—Structure of the Acids of. The viscous oil from the nut of *Ximenia Americana* L. was examined a few years ago by Puntam-Bekar and Krishna (*J. Indian Chem. Soc.*, 14 (1937), 268) who isolated the previously unknown ximenia acid, an unsaturated long-chain acid containing 26 carbon atoms. As the result of a more recent investigation by the Dutch chemist, Dr. H. A. Boekenoogen (*Fette u. Seifen*, Jan. 1940), the conclusion of the Indian workers that ximenic acid was a dehydrocerotic acid has been confirmed, and the following structure is now assigned to it: $CH_3—(CH_2)_6—CH=CH—(CH_2)_{15}—COOH$. Boekenoogen also isolated an unsaturated acid of the same family of still higher molecular weight, to which he gave the name of lumequic acid: $CH_3—(CH_2)_7—CH=CH—(C-$

$H_2)_{19}$—COOH. Ximenic acid, which, like all the other acids in the oil, is in glyceride combination, is present to the extent of about 15%. The percentage composition of the total fatty acids is given by Boekenoogen as: stearic acid, 4%; linolic acid, 10%; ximenic acid, 25%; oleic acid, 54%; cerotic acid, 2%; lumequic acid, 5%. Work on possible technical applications of the oil (originating in West Africa among other places) is in progress. In the meantime the fact that it contains wax acids in glyceride form renders it of unusual scientific interest.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 72. (A. C. DeD.)

Unclassified

Acetocodeine—Structure of. A Beckmann rearrangement of aceto-6-acetylcodeineoxime and identification of the resulting product as 1-acetylamino-6-acetylcodeine showed the acetyl grouping of acetocodeine to be in the 1-position. Laboratory directions are given for preparing the above compounds as well as 1-aminocodeine which was used in establishing the formula of acetylaminoacetylcodeine.—LYNDON SMALL and JAMES E. Mallonee. *J. Org. Chem.*, 5 (1940), 286–289. (W. T. S.)

Acetylamino Substituted Acids—Aromatic Mercury Salts of. Various details are given for the preparation of numerous antiseptic and therapeutic phenylmercury derivatives.—CARL N. ANDERSEN, assignor to LEVER BROS. CO. U. S. pat. 2,167,966, Aug. 1, 1939. (A. P.-C.)

Acylalkylglucamide Disulfides—Therapeutic Gold Compounds of. A soluble gold salt is caused to act upon a compound of the formula $(S(CH_2)_nCONR\text{-}CH_2(CHOH)_4CH_2OH)_2$, in which R is hydrogen or a lower alkyl group.—MAX BOCKMÜHL and GUSTAV EHRHART, assignors to WINTHROP CHEMICAL CO. U. S. pat. 2,174,412, Sept. 26, 1939. (A. P.-C.)

Aminomorphides and Aminocodides. The reaction of α-chloromorphide and α-chlorocodide with secondary amines or ammonia proceeds with a rearrangement such that the new basic groups appear at the 8-position. The morphine derivatives that are believed to have the halogen atom in the 8-position, as bromomorphide, bromocodide and β-chlorocodide, react with a rearrangement in the reverse sense, to give 6-aminomorphide and 6-aminocodide derivatives. The introduction of basic groups into the morphine or codeine molecule results in a considerable diminution of physiological action, especially analgesic effect.—L. SMALL and F. S. PALMER. *J. Am. Chem. Soc.*, 61 (1939), 2186. (E. B. S.)

Antihemorrhagic Compounds—Convenient Procedures for the Preparation of. Procedures for the synthesis of a series of related compounds of established antihemorrhagic activity (2-methyl-1,4-naphthoquinone, 2-methyl-1,4-naphthohydroquinone, phthiocol, vitamin K_1 (2-methyl-3-phytyl-1,4-naphthoquinone) and sodium 2-methyl-1,4-naphthohydroquinone disulfate) were developed as a result of experimentation undertaken with the object of simplifying and standardizing known processes reported previously. The methods given are believed to be more convenient and more rapid than any previously described.—LOUIS F. FIESER. *J. Biol. Chem.*, 133 (1940), 391. (F. J. S.)

Aromatic Nucleus—Reactivity of $CHCl.CCl_3$ Group Attached to an. α-Chloro derivatives of the condensation products of chloral with hydroxy- and methoxybenzoic acids were prepared by an improved method and the reactivity of the α-chlorine atom toward potassium iodide, potassium cyanide, ammonia and aniline have been investigated. It was found that the methoxy group in the nucleus has an inhibitng effect in the α-chlorine atom.—HAYAWADAN VAMANRAO DHARWARKAR and RUPCHAND LILARAM ALIMCHANDANI. *J. Indian Chem. Soc.*, 17 (1940), 416. (F. J. S.)

Arsenic Derivatives of 4-Phenylthiazole. *p*-(4-Thiazolyl)phenylarsonic acid was prepared by Bart's reaction from 4-phenylthiazoldiazonium chloride. The following techniques were studied: (I) The diazo solution was poured into a solution of sodium arsenite while being cooled by ice. A solution of sodium hydroxide was then added dropwise to this mixture with stirring and cooling. (II) The diazo solution was poured with stirring and cooling into the mixture consisting of the sodium hydroxide and sodium arsenite. (III) The diazo solution was poured into a solution of sodium arsenite and sodium hydroxide containing copper sulfate as a catalyst. The arsonic acid could be obtained in 40–60% yields by any of the above methods. Method (II), however, gave the purest product and the highest yield. With methods (I) and (II), the yield varied according to the amount of sodium hydroxide used, a better yield being obtained when an excess of sodium hydroxide was employed. *p*-(4-Thiazolyl)-phenylarsonic acid forms colorless needles decomposing at 331°.—FIJI OCHIAI and OSAMU SUZUKI. *J. Pharm. Soc. Japan*, 60 (1940), 353–356 (in English, 134–137). (N. L.)

Ascorbic Acid—Oxidation of, by Dichlorophenol-indophenol. When 0.5 cc. of 5% phosphotungstic acid is added to 0.5 cc. of 0.1% aqueous ascorbic acid and the solution is treated with alkali to p_H 4.0, a blue color is obtained, because of the reduction of phosphotungstic acid by the ascorbic acid. When 1 cc. of 0.1% ascorbic acid containing 1 mg. of acid is mixed at p_H 3.0 with sufficient Tillmans' reagent to oxidize 0.5 mg. of ascorbic acid the remaining 0.5 mg. no longer reduces phosphotungstic acid. If the oxidation of half the ascorbic acid in solution with Tillmans' reagent is carried out at p_H 3.5 instead of 3.0, the remaining ascorbic acid retains its capacity for reducing phosphotungstic acid.—N. I. GRIASNOV and R. S. TCHERNIAVSKAÏA. *Voprosy Pitaniya*, 7 (1938), No. 2, 1–11; through *Chimie & Industrie*, 42, 1939), 119. (A. P.-C.)

Ascorbic Acid—Production of. Fresh gladiolus leaves are comminuted and, with or without treatment with steam, are immediately pressed and the juice obtained, preferably mixed with a small quantity of potassium cyanide, is mixed with a miscible organic solvent, for example, methyl alcohol, and filtered. The filtrate is concentrated, the p_H adjusted to about 3 and a solvent, for example, acetone, is added. The precipitate is removed and the liquor is concentrated to a syrup, which may be treated, in methyl alcohol solution, with acetone-ether mixture to remove impurities, and the ascorbic acid is crystallized from an ethyl alcohol solution of the final syrup.—O. DALMER and H. WIETERS. U. S. pat. 2,078,237; through *J. Soc. Chem. Ind.*, 58 (1939), 994. (E. G. V.)

Benzimidazol—Catalytic Hydrogenation of Some Derivatives of. 2-Methyl-, 2-ethyl, 1,2-dimethyl- and 2-phenyl-benzimidazol were successfully hydrogenated catalytically into the corresponding tetrahydrogenated compounds. 2-Methyl-tetrahydrobenzimidazol produces a fairly active diuretic effect in the rabbit and dog; the other derivatives also are slightly diuretic. None of the compounds of this series exhibits any other physiological properties.—M. HARTMANN and L. PANIZZON. *Helv. Chim. Acta*, 21 (1938), 1692–1694; through *Chimie & Industrie*, 42 (1939), 123. (A. P.-C.)

Benzoic Acid Alkamine Ester Salts and Intermediates—Alkyl Thio-Substituted. Numerous esters of alkyl thio-substituted benzoic acids (properties and details of preparation of which are given) are of relatively high effectiveness and low toxicity

when used as local anesthetics in the form of their citrates.—JOHN J. DONLEAVY, assignor to PITMAN-MOORE CO. U. S. pat. 2,173,827, Sept. 26, 1939. (A. P.-C.)

Benzyloxyaryl Aromatic Sulfonates. By effecting reaction between the monobenzyl ethers of various glycols and aromatic sulfonyl chlorides, in the presence of an alkaline condensing agent such as pyridine, intermediate products are obtained from which other products may be prepared which have a highly antipneumococcic effect.—COURTLAND L. BUTLER, LEONARD H. CRETCHER and ALICE G. RENFREW assignors to MELLON INSTITUTE OF INDUSTRIAL RESEARCH. U. S. pats. 2,172,606 to 2,172,608, Sept. 12, 1939. (A. P.-C.)

Bismuth Salts—Production of Oil-Soluble. Oil-soluble bismuth salts are obtained by interaction of a freshly prepared basic salt of bismuth soluble in aqueous glycerol (for example, the subnitrate) with and α-alkylcarbalkoxyacetic acid or an alkali salt thereof, in which the alkyl is not less than C_5 and the alkoxy not more than C_4; this is conveniently made by partial hydrolysis of the appropriate dimalonate. The reaction is conveniently carried out in water. β-Ethylhexyl ethylmalonate (I) is hydrolyzed to the mono-ester sodium salt with sodium hydroxide in ethyl alcohol at 0°, the ethyl alcohol removed in vacuum and the salt dissolved in water and treated with a solution of bismuth subnitrate in aqueous glycerol or mannitol; the precipitate is filtered off and the bismuth salt extracted with benzene or ether. β-Ethylbutyl, β-ethylamyl, β, δ-dimethylamyl, decyl, dodecyl, octadecyl or κ-octadecenyl ethylmalonates may be used instead of I. The products are suitable for intramuscular injection in oil and are less irritant than "Biliposol."—H. A. SHONLE and J. H. WALDO. Brit. pat. 506,593; through *J. Soc. Chem. Ind.*, 58 (1939), 994. (E. G. V.)

Chloralamides. The Reaction of Potassium Cyanide on α-Chlorochloralchloro-2-Methoxy- and α-Chlorochloral-Bromo-2-Methoxybenzamides and the Hydrolysis of the Resulting α-Cyano Compounds. α-Chlorochloralchloro-2-methoxy- and α-chlorochloral-bromo-2-methoxybenzamides have been reacted with potassium cyanide to obtain α-cyano compounds of the type R.CO.NH.C(CN):-CCl_2. The nitriles were hydrolyzed with concentrated hydrochloric acid to the corresponding carboxylic acids which formed metallic salts.—N. W. HIRWE and K. N. RANA. *J. Indian Chem. Soc.*, 17 (1940), 481. (F. J. S.)

Cyanine Dyes of the Pyridine Series. *p*-Dimethylaminobenzaldehyde and *p*-nitrosodimethylaniline have been condensed with the methochloride, methobromide and methoiodide of 2-methylpyridine, and the properties of the products examined including their absorption spectra and fluorescence.—M. Q. DOJA. *J. Indian Chem. Soc.*, 17 (1940), 347. (F. J. S.)

Cyanocamphoranilic Acids and Their Rotatory Powers. 3'- and 4'-Cyanocamphoranilic acids have been prepared and their rotatory powers determined. The position of CN group in the sequence of substituent groups is anomalous. It should be in the proximity of the COOH group, but it actually falls with the halogens.—MAHAN SINGH and ARJAN SINGH. *J. Indian Chem. Soc.*, 17 (1940), 485. (F. J. S.)

6-Desoxy-*d*-Araboascorbic Acid. This acid was prepared from 2,3-monoacetone-*d*-glucomethylosonic acid by heating with hydrochloric acid in hydroalcoholic solution. It could not be obtained in the crystalline state. It is a colorless syrup, readily soluble in water, alcohol, acetone and ethyl acetate, slightly soluble in ether. Its antiscorbutic action is from 100 to 150 times weaker than that of ascorbic acid.—W. T. J. MORGAN and T. REICHSTEIN. *Helv. Chim. Acta*, 21 (1938), 1459–1463; through *Chimie & Industrie*, 42 (1939), 118–119. (A. P.-C.)

4,4'-Diaminodiphenylsulfone. Friedel-Crafts Reactions with Halogenides Containing Sulfur. I. In the course of a study of the Friedel-Crafts reaction with halogenides containing sulfur, such as sulfuryl chloride, thionyl chloride, benzenesulfonyl chloride, etc., the authors succeeded in synthesizing 4,4'-diaminodiphenylsulfone. The therapeutic value of this compound has previously been reported (*Ber.*, 71A (1938), 15). The method of synthesis is: 10.8 Gm. of acetanilide and 4.8 Gm. of thionyl chloride were dissolved in 120 cc. dry carbon disulfide and to this mixture were added 22.0 Gm. of aluminum chloride in small portions. The reaction mixture was heated on a water bath for an hour after evolution of hydrogen chloride had ceased. The yield of 4,4'-diacetaminodiphenylsulfoxide, melting at 278° after a recrystallization from dilute alcohol, was 10.7 Gm. or 85% of the theoretical. Eleven Gm. of the sulfoxide thus obtained were dissolved in 330 cc. of acetic acid and oxidized at 40–45° by means of 33.0 Gm. of potassium dichromate, 27.5 Gm. of sulfuric acid and 143 cc. water. The reaction mixture was then poured into water and, after standing, 9.2 Gm. of yellow crystals of 4,4'-diacetaminodiphenylsulfone separated. A recrystallization from alcohol gave colorless needles melting at 283°. Hydrolysis of this amide by means of excess 10% hydrochloric acid gave 4,4'-diaminodiphenylsulfone in a yield of 87%. Recrystallization from dilute alcohol gave colorless needles melting at 176°. When a mixture of 4,4'-diaminodiphenylsulfone, 3.6 Gm. of *p*-acetaminophenylsulfonyl chloride and 1.5 Gm. of sodium bicarbonate in 60 cc. of acetone was allowed to stand over night and then refluxed on a water bath for two hours, 3.9 Gm. (83% of the theory) of 4,4'-*d*-*p*-acetylsulfanilamido)-diphenylsulfone were obtained. Recrystallization from dilute alcohol gave colorless crystals melting at 273–274°.—SHIGEHIKO SUGASAWA and KIITI SAKURAI. *J. Pharm. Soc. Japan*, 60 (1940), 1–3 (in English). (N. L.)

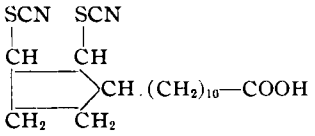
Dibenzo(f,h)quinoline and Certain Derivatives—Synthesis of. This work is a portion of the joint efforts of several agencies in the United States to solve the problem of drug addiction. Dibenzo-(f,h)quinoline (I) was prepared by applying the Skraup synthesis to 9-aminophenanthrene. Catalytic hydrogenation of I converted it to the "py-tetrahydro" derivative (II). Treatment of II with KOH and MeI yielded the tertiary base 1-methyl-1-2-3-4-tetrahydrodibenzo(f,h)quinoline instead of the expected methiodide of II. It was postulated that the methiodide was unobtainable here due to the hindering effect caused by the proximity of carbon atom 12 to the 1-*N*-methyl group. The HCl of the tertiary base was prepared and described. 7-Hydroxydibenzo(f,h)quinoline (III) was prepared by applying the Skraup synthesis to 3-methoxy-9-aminophenanthrene. Reduction of III in the presence of chromite gave the "py-tetrahydro" derivative (IV). Treatment of IV with MeI and alkali yielded the corresponding 1-methyl-7-methoxy derivative. The methiodide of this *N*-methyl-tetrahydro base was likewise formed only with difficulty.—JOHN KRUEGER and ERICH MOSETTIG. *J. Org. Chem.*, 5 (1940), 313–317. (W. T. S.)

Ferrohemoglobin, Cyanide Ion and Cyanide Ferrohemoglobin—Magnetic Study of the Equilibrium between. Spectroscopic and magnetic evidence of the formation of a compound of ferrohemoglobin with cyanide has been obtained and the equilibrium has been studied. The stability of the com-

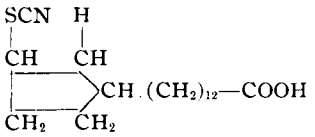
pound is much less than that of ferrohemoglobin cyanide; about one-half of the ferrohemoglobin is in the form of cyanide ferrohemoglobin in 0.8*f* cyanide solution. It is concluded that cyanide ferrohemoglobin is diamagnetic, with essentially covalent octahedral coördination about the iron atoms, its structure thus being similar to that of oxyhemoglobin and carbon monoxyhemoglobin.—F. STITT and C. D. CORYELL. *J. Am. Chem. Soc.*, 61 (1939), 1263. (E. B. S.)

Hibiscus "Flowers," a Drug Used in the Preparation of Foods and Drinks, Its Principal Constituent Being a New Acid (Hibiscic Acid) Similar to Lævulic Acid. The botanical and chemical characters of the dried calyx of *Hibiscus sabdariffa* L., are described. The acid taste is due to an aliphatic dicarboxylic acid, hibiscic acid, $C_6H_8O_7$, melting point 181–183° (decomposition), yielding crystalline neutral lead (+ water) and quinine (+ water) salts, melting point 227–228° (decomposition), and *p*-nitrobenzyl, melting point 172° (decomposition), and phenacyl melting point 177° (decomposition), esters.—C. GRIEBEL. *Z. Untersuch. Lebensm.*, 77 (1939), 561–567; through *J. Soc. Chem. Ind.*, 58 (1939), 993. (E. G. V.)

Hydnocarpic and Chaulmoogric Acids—Thiocyanide Derivatives of. The authors give a description of the preparation of the dithiocyanide of dihydrohydnocarpic acid (I) and the thiocyanide of



(I)



(II)

dihydrochaulmoogric acid (II).—HERBERT ARNOLD. *Arch. pharm.*, 277 (1939), 206–211. (L. K.)

α-Hydrindone and α-Tetralone—Influence of Substitution on the Formation of Derivatives of. Synthesis of 1:2:3:4-Tetrahydronaphthalene-1:2-dicarboxylic Acid. The present investigation describes a method for the synthesis of 1:2-dicarboxy-1:2:3:4-tetrahydronaphthalenes, which are important for the synthesis of benzanthracene derivatives with carcinogenic properties.—NRIPENDRA NATH CHATTERJEE and GIRINDRA NATH BARPUJARI. *J. Indian Chem. Soc.*, 17 (1940), 292. (F. J. S.)

β-Indolacetic Acid—Synthesis of. II. β-Cyanopropionaldehyde-diethyl acetal prepared by the method of Wohl (*Ber.*, 39, 1952) was converted into β-cyanopropionaldehyde phenylhydrazone, melting point 49–50°; 1.2 Gm. of the phenylhydrazone was fused with 1.2 Gm. of zinc chloride for one hour at 150°; the mass was then treated with water and the insoluble residue was heated for six hours with 20% sodium hydroxide solution. The yield of β-indolacetic acid was only 0.15 Gm. A second method of synthesis consisted in heating a mixture of 10.0 Gm. of β-cyanopropionaldehyde-diethyl acetal, 70 Gm. of phenylhydrazine, 10.0 Gm. of zinc chloride and 4.0 Gm. of calcium chloride for three hours at 110–115° and then fusing for twenty minutes at 150°. The zinc and calcium salts were then washed out and the product hydrolyzed by heating with 20% sodium hydroxide solution for three hours. The yield of crude β-indolacetic acid was 1.5 Gm.; recrystallization from benzene gave colorless crystals melting at 165–166°.—JUNKI TANAKA. *J. Pharm. Soc. Japan*, 60 (1940), 219–222 (in German, 75–76). (N. L.)

Insulin Preparation—Manufacture of. Buffered preparations of insulin and (human) globin, optionally containing a zinc salt and/or cresol (as antiseptic), are claimed to act quickly but maintain their activity longer after injection than insulin along.—BURROUGHS, WELLCOME AND CO. INC., (U. S. A.), assignee of L. REINER. Brit. pat. 508,983; through *J. Soc. Chem. Ind.*, 58 (1939), 1295. (E. G. V.)

N - Lower - Dialkyl - Coumarin - 3 - Carboxamides. Sedative compounds of but slight toxicity are produced by various reactions, preferably by treating coumarin-3-carbonyl chloride with a lower dialkylamine.—OTTO DALMER and FRITZ VON WERDER, assignors to MERCK & CO., INC. U. S. pat. 2,170,127, Aug. 22, 1939. (A. P.-C.)

Lupinine. Synthesis of Allolupinine. XVII. The authors give a description of the preparation of α-2-pyridyl-ω-trichlor-β-oxypropane, piperidylpropionyl chloride hydrochloride, and pyridylpropionic acid.—K. WINTERFELD and F. W. HOLSCHNEIDER. *Arch. pharm.*, 277 (1939), 192–203. (L. K.)

Medicinal Preparations—Preparation and Utilization of, Including Aminopyridine Salts. Preparations for use as internal or external antiseptics are claimed containing salts of 2:6-diaminopyridine (acetate, melting at 116–117°; benzoate, melting at 148°; salicylate, melting at 161–163°).—E. T. TISZA. U. S. pat. 2,080,517; through *J. Soc. Chem. Ind.*, 59 (1940), 87. (E. G. V.)

Monoethylaniline—Sulfonation of. The sulfonation of monoethylaniline and the *N*-ethylation of *p*-toluene-sulfonyl-sulfanilic, metanilic and orthoanilic acids, has been studied and it has been found that the sulfonation proceeds exactly as in the case of monomethylaniline.—G. V. SHIROLKAR, I. S. UPPAL and K. VENKATARAMAN. *J. Indian Chem. Soc.*, 17 (1940), 443. (F. J. S.)

Musk Perfumed Materials. A lecture. The chemical constitution and synthesis of civetone, muscone, ambrettolide and related ring compounds (synthetic lactones, ketones, etc.) are reviewed.—M. STOLL. *Fette u. Seifen*, 46 (1940), 136–139; through *Perfumer. Essent. Oil Record*, 31 (1940), 164. (A. C. DeD.)

Nirvanol—Synthesis of Colored Derivatives of. II. N-Benzyl Azo Compounds. Nirvanol has been converted into colored derivatives. The latter contain a substituted aryl-azo-benzyl grouping attached to the nitrogen in the 3-position of the heterocycle.—S. P. LINGO with H. R. HENZE. *J. Am. Chem. Soc.*, 61 (1939), 2029. (E. B. S.)

Periodic Acid—Action of, on Lactic Acid and Its Decomposition Products. The following conclusions are given: At boiling water bath temperature periodic acid rapidly oxidizes lactic acid to acetaldehyde and carbon dioxide. If the reaction is allowed to continue for a long time the aldehyde is oxidized by the periodic acid. This oxidation occurs very slowly in the cold. The first step of the reaction is a rupture of the carbon linkage and formation of formic acid and methyl alcohol, which are then further oxidized to carbon dioxide and water, and formaldehyde, respectively. The essential feature of the oxidation by periodic acid is the splitting of the carbon linkage, the action being noted not only in a chain having hydroxyl groups on two adjacent carbon atoms but also where the two contiguous functional groups are a carboxyl and a hydroxyl, and even when the chain has only one functional

group (aldehyde).—P. FLEURY and R. BOISSON. *J. pharm. chim.*, 30 (1939), 145–161. (S. W. G.)

Phenanthridine Derivatives—Partially Hydrogenated, Synthesis of. II. The authors became interested in phenanthridine derivatives as possible synthetic antimalarials in view of their close chemical relationship to quinoline and isoquinoline derivatives. 6,7-Dimethyl-5,6,7,8,9,10,13,14-octahydrophenanthridine was prepared by condensing cinnamic acid with 2,3-dimethylbutadiene to give 2-phenyl-4,5-dimethyltetrahydrobenzoic acid. Catalytic reduction of the acid gave 2-phenyl-4,5-dimethylhexahydrobenzoic acid which was converted into its acid chloride by means of thionyl chloride and then into 2,3-dimethyl-1,2,3,4,10,11-hexahydrofluorenon by heating with aluminum chloride in carbon disulfide. The fluorenone was treated with sodamide and sulfuric acid to give 6,7-dimethyl-5,6,7,8,13,14-hexahydrophenanthridone which was in turn reduced to 6,7,-dimethyl-5,6,7,8,9,10,13,14-octahydrophenanthridine. The corresponding 2,3-dimethoxy-5,8,9,10,13,14-hexahydrophenanthridine was prepared by a similar series of reactions. The equations are outlined and the experimental details are also described.—SHIGEHIKO SUGASAWA, KUNIMI KODAMA and SHINNAI HARA. *J. Pharm. Soc. Japan*, 60, (1940), 356-361 (in English, 138–142). (N. L.)

Phenolphthalein—Manufacture of. Phenol, phthalic anhydride and phthaloyl chloride are condensed together in the presence of anhydrous zinc chloride (suitably at 100 to 140° C. for 6.5 to 16 hours).—MAX HUBACHER, assignor to EX-LAX, INC. U. S. pat. 2,168,346, Aug. 8, 1939. (A. P.-C.)

Phenols—Separation of, from Solvents Such as Those of Germinal Gland Hormone Solutions. Impure hormone solutions are treated under substantially anhydrous conditions with an excess of an inorganic alkaline compound reacting with phenolic hydroxyl groups to effect precipitation of the phenols, and precipitated phenolate material is separated.—ERWIN SCHWENK and BRADLEY WHITMAN, assignors to SCHERING CORP. U. S. pat. 2,174,532, Oct. 3, 1939. (A. P.-C.)

Phenylation- Mechanism of Catalytic, and Its Inhibition by Iron. In a previous study of the catalytic phenylation of α-naphthylamine by iodine, the active agent was found to be hydriodic acid, and the present investigation has indicated its superiority with respect to several other acids over the same period of time. The conclusion from the former investigation was that phenylation proceeded via the formation and subsequent decomposition of a complex between aniline, α-naphthylamine and hydriodic acid, and it follows that this mechanism, if valid, should be unimolecular in character. The quantitative examination of the phenylation process has justified such a deduction. Iron appears to inhibit the phenylation reaction, and anhydrous ferrous iodide to have no effect on it.—H. H. HODGSON and E. MARSDEN. *J. Soc. Chem. Ind.*, 58 (1939), 290. (E. G. V.)

Polycyclic Aromatic Hydrocarbons. XXII. The inherent carcinogenic activity of the substituted 3:4-benzphenanthrene molecule has stimulated much research on this and related substances. 1:2-Dimethylchrysene has been obtained by an adaptation of the Pschorr synthesis of phenanthrene derivatives and also by the action of methylmagnesium iodide on chrysaquinone. In the course of unsuccessful attempts to synthesize 1:2:3:4-tetramethylphenanthrene, 1:2:3:4-tetramethylanthracene was obtained. 1-Methyl-3:4-benzphenanthrene has been obtained by indirect reduction of 3:4-benz-1-phenanthroic acid and a new route of 2-substituted 3:4-benzphenanthrenes, for example, 2-isopropyl-3:4-benzphenanthrene, has been devised. A review of literature in the field is included.—C. L. HEWETT. *J. Chem. Soc.*, (1940), 293-303. (W. T. S.)

Quinones by the Peroxide Oxidation of Aromatic Compounds. In an attempt to prepare 1-naphthoic acid by oxidizing the aldehyde with perhydrol, a quantity of 1,4-naphthaquinone was formed. This fact, linked with the new importance of quinones (*e. g.*, vitamins E, K, sex hormones, etc.), led the authors to investigate the oxidation of other aromatic compounds by perhydrol in glacial acetic acid. Eight aromatic hydrocarbons including benzene, naphthalene and anthracene derivatives were thus oxidized to the corresponding quinones in yields ranging from 20–78%. This method was found to be especially applicable to the formation of quinones from alkyl derivatives of polycyclics.—RICHARD T. ARNOLD and RAYMOND LARSON. *J. Org. Chem.*, 5 (1940), 250–252. (W. T. S.)

Reineckates—Study of Several Organic. The salts were prepared by pouring the slightly acid (5% hydrochloric acid) solutions of the organ bases into an excess of the reagent prepared according to Escales (*Ber.*, 95 (1903), 2681) except that ammonium dichromate was used in place of potassium dichromate. The findings of earlier workers were checked and the properties of the prepared compounds were studied. The compounds form microcrystals, some of them having characteristic forms: triethanolamine reineckate forms hexagonal plates; betaine reineckate forms lance-shaped plates; *p*-phenylenediamine reineckate forms fern-like needles. The colors vary with the degree of acidity and the concentration from rose to violet. The formula $\left[Cr\begin{matrix}(NH_3)_2\\(SCN)_4\end{matrix}\right]B$, where *B* is a monovalent organic base, was confirmed by determination of the chromium after ignition and weighing as chromium trioxide, and by determination of the thiocyanate groups by the bromatometric method. Some bases like antipyrine, pyramidon and quinine do not form well-defined reineckates. Limits of precipitation, calculated and found analytical values, and solubilities in water, methanol and ethanol are tabulated.—R. COUPECHOUX. *J. pharm. chim.*, 30 (1939), 118–129. (S. W. G.)

Sulfamic Acid and Its Esters. Sulfamic acid, or aminosulfinic acid, NH_2SO_2H, a product of the reaction of sulfur dioxide with ammonia gas, has recently been recommended as an addition to liquid soaps for the purpose of preventing gelling; it is also claimed to increase the solubility of sulfonated fatty alcohol detergents. Esterified with fatty alcohols, sulfamic acid gives products which are useful as foaming agents.—ANON. *Perfumer. Essent. Oil Record*, 31 (1940), 264. (A. C. DeD.)

Sulfamide Derivatives—Contribution to Study of. Morpholine was condensed in alkaline medium with *p*-acetamino-benzene-sulfochloride to yield 4(*p*-acetamine-benzene-sulfonyl)-morpholine, m. p. 105–6°. Deacetylation in hydrochloric acid medium yielded the base 4(*p*-amino-benzene-sulfonyl)-morpholine, m. p. 216–17°. Both of the derivatives show antibacterial activity.—H. MORREN and R. LEHMANN. *J. pharm. Belg.*, 21 (1939), 953. (S. W. G.)

Sulfanilamide Derivatives—Structure and Chemotherapeutic Activities of. A review of the chemotherapy of sulfanilamide and its derivatives under the sponsorship of the Division of Medicinal Chemistry of the American Chemical Society. A brief introduction of the general significance and the measurement of the chemotherapeutic activities of sulfanilamide and its derivatives is given. The system of nomenclature of these compounds generally accepted, is described and illustrated by ex-

amples. Simple derivatives are best named as derivatives of sulfanilamide, and to distinguish between the nitrogens, substituents of the amido group are called N^1-substituents, while those of the amino group are N^4-substituents. The author classifies sulfanilamide derivatives as follows: (I) nuclear-substituted sulfanilamides; (II) N^1-substituted sulfanilamides; (III) N^4-substituted sulfanilamides; (IV) nuclear, N^1-substituted sulfanilamides; (V) nuclear, N^4-substituted sulfanilamides; (VI) N^1,N^4-substituted sulfanilamides; (VII) nuclear, N^1,N^4-substituted sulfanilamides; (VIII) salts of sulfanilamide; and (IX) unclassified sulfanilamide derivatives. Each of the above main divisions is further subdivided into the following: (*A*) inorganic substituents, (*B*) acyclic substituents, (*C*) iso-cyclic substituents, (*D*) heterocyclic substituents, (*E*) acyl substituents, (*F*) sulfonyl substituents, (*G*) anils (Schiff bases) and (*H*) azo derivatives. The general conclusions on the correlation of structure and chemotherapeutic activity of approximately 1300 compounds studied in the above classification are summarized: (1) nuclear-substituted sulfanilamides are usually inactive. (2) N^1-substitution in sulfanilamide has given the most promising new derivatives. The N^1-acyclic derivatives and N^1-arylsufanilamides are not as active as the parent sulfanilamide. N^1-heterocyclicsulfanilamides show great activity against pneumococci and equal or better activity against streptococci than sulfanilamide. Substituents on the heterocyclic ring modify the activity, and position isomerism of such substituents may have a profound influence on the activity. Some N^1-acylsulfanilamides show somewhat greater activities than sulfanilamide on an equimolecular dosage. N^1-sulfonylsulfanilamides are generally inactive. (3) Blocking the N^4-nitrogen in sulfanilamide by a group which is not removed *in vivo* destroys the activity. Groups which destroy the activity are alkyl, aryl or sulfonyl. Groups which may be removed or converted *in vivo* to the free amine (or an active substance derived from the free amine) are anils, formaldehyde-bisulfite and formaldehyde-sulfoxalate derivatives. (4) N^1-nuclear-,N^4-nuclear, N^1,N^4 and N^1,N^4-nuclear-substituted sulfanilamides follow in general the activities to be expected as the result of combining substituents on the basis of the above correlations. The methods for the chemical synthesis of derivatives of sulfanilamide and analytical procedures are discussed. The review is accompanied by sixty tables listing the various sulfanilamide derivatives, including one table which lists fifty trade names of sulfanilamide derivatives with their corresponding chemical names and structural formulas. The bibliography contains 198 literature references. A list of journals and the date through which each was searched for literature is also presented.—E. H. NORTHEY. *Chem. Rev.*, 27 (1940),85–198. (N. L.)

Sulfhydryl Keratinic Acid—Heavy Metal Compounds of. Chemotherapeutic compounds derived from keratin which are rich in heavy metal, are prepared by hydrolyzing keratin material with acid at least to the stage of formation of a gelatinous product. The latter is reduced with a metal and the reduced material is freed from metal and then treated with a soluble salt of gold, silver, mercury, copper, lead, antimony, tin, zinc or iron, the quantity of metal used being at least about double that necessary for saturating the sulfhydryl groups of the keratin degradation product. The mixture is neutralized with alkali, and the resulting deposit which forms is filtered off, the solution is introduced into an organic solvent and the compound rich in heavy metal which is deposited is separated.—ERNST STURM and RICHARD FLEISCHMANN, assignors to FIRMA JOHANN A. WÜLPING. U. S. pat. 2,172,717, Sept. 12, 1939. (A. P.-C.)

5-Sulfonylbarbituric Acids. Attempts to synthesize 5,5-disulfonyl derivatives of barbituric acid were unsuccessful. *p*-Thiocresol did not react with alloxan while benzyl mercaptan gave 5-hydroxy-5-(benzylthio)-barbituric acid in dioxane as a solvent and 5-acetoxy-5-(benzylthio)-barbituric acid in acetic acid acetic anhydride. Sodium *p*-toluenesulfinate with 5,5-dibromobarbituric acid gave sodium 5-bromobarbiturate, accompanied by oxidation products of the sulfinate. The reaction at room temperature of sodium *p*-toluenesulfinate with 5-ethyl-5-bromobarbituric acid and with 5-ethyl-5-bromo-2-thiobarbituric acid gave 5-*p*-tolylsulfonyl-5-ethylbarbituric acid and 5-*p*-tolylsulfonyl-5-ethyl-2-thiobarbituric acid. The by-products show that the yield of metathesis products is lowered by oxidation-reduction reactions and by the ease of alcoholysis of the product.—E. L. D'OUVILLE, F. J. MYERS and R. CONNER. *J. Am. Chem. Soc.*, 61 (1939), 2033. (E. B. S.)

Sulfophenylarsonic Acids and Certain of Their Derivatives. II. *p*-Sulfonamidophenylarsonic Acid. The preparation and properties of *p*-sulfonamidophenylarsonic acid and a number of its derivatives have been described.—J. F. ONETO and E. L. WAY. *J. Am. Chem. Soc.*, 61 (1939), 2105. (E. B. S.)

Thiobarbituric Acids (Hypnotics)—Substituted, Manufacture of. 5:5-Disubstituted thiobarbituric acids, in which one substituent is cycloalkenyl and the other alkyl of alkenyl, are prepared by standard methods, *e. g.*, 5-$\Delta^{2'}$-cyclohexenyl-5-ethyl-, melting at 192°, 5-$\Delta^{1'}$-cyclohexenyl-5-ethyl-, melting at 192°, 5-$\Delta^{1'}$-cyclohexenyl-5-methyl-, melting at 172°, and 5-$\Delta^{1'}$-cyclopentenyl-5 ethylthiobarbituric acid melting at 184°, are prepared from thiourea and the appropriately substituted malonic ester.—H. C. CARRINGTON and IMPERIAL CHMEICAL INDUSTRIES, LTD. Brit. pat. 510,543; through *J. Soc. Chem. Ind.*, 59 (1940), 87. (E. G. V.)

Thymol Derivatives. IV. Preparation of *p*-Thymotinic Acid. Thymotinic acid is prepared by the Reimer-Tiemann method with a yield of 10–11%. **V. An Attempt to Convert *o*-Thymotinic Acid to Its Para Isomer.** This acid in low yields is prepared by the Spallino and Provenzal method and no *para* isomer is formed. **VI. An Attempt to Oxidize *p*-Thymotinic Acid Aldehyde by Fusion with Potassium Hydroxide.** In these experiments the method of Lock was followed and it was shown that dialkyl substitution in the benzene nucleus inhibits the oxidation of *p*-hydroxy-aldehydes to the corresponding acids. **VII. Action of Potassium Permanganate and Hydrogen Peroxide on *p*-Thymotinic Aldehyde.** The oxidation methods of Paal, of Lustig and of Dakin were used. Results indicate that *p*-thymotinic aldehyde is not oxidized by alkaline potassium permanganate and oxidation with hydrogen peroxide yields hydrothymoquinone.—CLARENCE W. SONDERN. *Pharm. Arch.*, 11 (1940), 49–57. (H. M. B.)

5,6,4′- and 5,8,4′-Trihydroxyflavone—Synthesis of. A flavone derivative referred to as B-crystal, isolated from the leaves of *Ginkgo biloba* L. (Ityo) was assumed to be 5,8-dihydroxy-4′-methoxyflavone. The author synthesized both 5,6,4′- and 5,8,-4′-trihydroxyflavone but neither of these two derivatives were identical with the flavone isolated from the leaves of *Ginkgo biloka*. A flow chart outlining the reactions used to synthesize these derivatives and details of the experimental procedures are also given.—ZEN'ICHI HORII. *J. Pharm. Soc. Japan*, 60 (1940), 222–228 (in English, 81–86). (N. L.)

BIOCHEMISTRY

Absorption Spectrophotometry in Pharmaceutical Analysis. I. Estrogenic Preparations. The following summary is given: (1) This paper gives prelimi-

nary results on attempts to use spectrometric absorption methods in the routine control of tablets and ampuls of certain estrogenic compounds. The results obtained are promising, particularly in those cases where the hormone can be separated from the diluent, and it is intended to pursue this subject further. (2) Curves are given for diethylstilbestrol, diethylstilbestrol dipropionate, hexestrol, estradiol monobenzoate and progesterone, together with the numerical values of their extinction coefficients. Tentative values have been assumed, which may have to be modified when more samples have been examined. (3) The methods used possess the advantage that only small quantities are required for analysis—an important point where expensive chemicals are concerned—and also allow of determinations being made on individual tablets or ampuls, and they are therefore of particular value in checking the uniformity of dosage.—W. F. ELVIDGE *Quart. J. Pharm. Pharmacol.*, 12 (1939), 347-360. (S. W. G.)

Acetone Bodies in Blood—Method for, Applicable to the Determination of Small Amounts of Mercury. A method is described for acetone bodies in blood which depends upon the formation of the Dènigés' precipitate under conditions essentially those used by Van Slyke, isolation of the precipitate and determination of the mercury content of the precipitate by means of the specific interference of mercury with the color formed when thiocyanate is added to an excess of ferric nitrate. It is believed that the method may be useful in the determination of mercury in other materials when interfering ions (especially chloride, sulfate and oxalate) can be excluded. The method is believed to be accurate within ±5% for the concentration of acetone bodies encountered in ketosis and within somewhat larger limits for the amounts present in normal blood.—LATHAN A. CRANDALL, JR. *J. Biol. Chem.*, 133 (1940), 539. (F. J. S.)

Acetone Bodies in Blood and Urine—Modified Salicylaldehyde Method for the Determination of. A modified salicylaldehyde method for the determination of acetone in distillates from urine or blood filtrate is described. The reaction takes place in a concentrated mixture of the reacting substances without the application of heat and is complete in 20 minutes. The precipitate which forms is dissolved either in water or alcohol. The range and sensitivity of the method are somewhat increased over that of previous salicylaldehyde methods. Either a visual or photoelectric colorimeter can be used. An almost exact proportionality exists between acetone concentration and scale reading in a visual colorimeter. Artificial color standards for visual colorimetry are also described. Procedures for the oxidation of β-hydroxybutyric acid and the distillation of acetone have been slightly modified. The specificity of the reaction is briefly discussed.—JEANETTE ALLEN BEHRE. *J. Biol. Chem.*, 136 (1940), 25. (F. J. S.)

Androstenediol—Monoformate of. The monoformate of androstenediol is produced by reducing the keto group of the formate of dehydroandrosterone to a carbinol group with hydrogen in the presence of a non-noble hydrogenating metal catalyst such as nickel or cobalt in a neutral medium such as an aliphatic alcohol of low molecular weight. Various examples of similar reactions also are given, for the production of therapeutic compounds active in the testing of sexual activity.—LEOPOLD RUZICKA, ALBERT WETTSTEIN and HANS KAEGL, assignors to SOC. POUR L'INDUSTRIE CHIMIQUE À BÂLE. U. S. pat. 2,173,425, Sept. 19, 1939. (A. P.-C.)

Anterior Pituitary-Like Gonadotropic Hormone from the Human Urine of Pregnancy—Observations on the. I. The anterior pituitary-like gonadotropic hormone from pregnancy urine has been concentrated. The most concentrated preparation contains nitrogen (6.89%), carbohydrate (6.86%) and tyrosine (2.20%). It gives negative Millon's, Molish and Fehling's tests but positive xanthoproteic and orcinol-sulfuric acid tests. It is stable below p_H 5.6 at 10° and is partially inactivated by H_2S and H_2O_2.—A. C. MAJUMDAR. *J. Indian Chem. Soc.*, 17 (1940), 469. (F. J. S.)

Antianemic Factor Present in Raw Liver—Isolation of. A purely organic substance has been isolated which has been proved by clinical tests to possess powerful reticulocytic activity. The substance is free from all traces of metals, it is not an amino acid, does not give the "Pauly reaction," does not respond to the "Ninhydrin test," it is not a polypeptide, it contains sulfur and nitrogen and forms a picrate, m. p. 235° (C, 38.34; H, 2.89; N, 19.38 per cent). The material was further fractionated by liberating it from the picrate at different p_H values in the acid range. The compound obtained at p_H 0.5 is highly active and forms a picrate in yellow cubes, m. p. 245°. (Found: N, 20.7 per cent.) The depicrated material is a colorless substance, precipitated by phosphotungstic acid and gives the pyrrole reaction. By clinical test it has been found to be potent against anemia either when injected or administered orally. Sulfur forms a part of the constitution of the active material since it gives a crystalline compound with mercuric chloride.—S. K. MITRA. *J. Indian Chem. Soc.*, 17 (1940), 355. (F. J. S.)

Arakawa's Reaction and Vitamin C of Human Milk. Human milk has the anti-oxidative function, which is stronger in Arakawa-negative milk than in Arakawa-positive milk. Human milk will oxidize the vitamin C-like substance in human milk and synthetic ascorbic acid in coöperation with Arakawa's Reagent III. Though it is a question whether this is due to peroxidase in it, the effect of the oxidation is much stronger in Arakawa-negative milk. This effect is not seen in heated human milk. The peroxidase concentrate prepared from cow's milk has the effect of converting into the reversibly oxidized form the vitamin C-like substance and ascorbic acid. The reversible oxidation capacity is not influenced by the anti-oxidative function of human milk, of heated human milk and of NaCl. The reversibly oxidation capacity of human milk with AR 5′(−) plus Arakawa's Reagent III is not equal among different milk specimens, though there is a definite limit of fluctuation. The reversibly oxidized form of vitamin C-like substance is present in a large amount in Arakawa-positive milk, but it can be identified in Arakawa-negative milk too. The difference of the content of the reversibly oxidized form in human milk has its cause probably in mammary glands themselves. The difference of the vitamin C-like substance and that of Arakawa's reaction are concomitant, though one of these is not successive to the other.—S. ISONO. *Tôhoku J. Exp. Med.*, 35 (1939), 480. (A. C. DeD.)

Ascorbic Acid in Urine—Stability and State of. Treatment with acetic, metaphosphoric, hydrochloric, sulfuric acids and with diethyl dithiocarbamate shows that sulfuric acid is the best preservative for vitamin C in urine and this has been confirmed by treatment of the urine with ascorbic acid oxidase. Treatment of the urine with sulfuretted hydrogen in the cold and hot conditions shows that urine contains ascorbic acid, dehydroascorbic acid, combined ascorbic acid and non-specific reducing substances both in the free and combined states. This has been shown by treatment with ascorbic acid oxidase as well as with barium acetate.—SACHCHIDANANDA BANERJEE. *J. Indian Chem. Soc.*, 17 (1940), 463. (F. J. S.)

Ascorbic Acid—New Reactions of, with Alkaloids and Sterols. A comparison was made of the colored zones obtained (*a*) by adding the freshly distilled furfurol obtained in varying concentrations by distilling a solution of ascorbic acid in 100 cc. of hydrochloric acid (specific gravity 1.06) in a stream of carbon dioxide, to the compound under test in alcohol and layering with concentrated sulfuric acid, and (*b*) with freshly distilled commercial furfurol (in an atmosphere of carbon dioxide). Controls in the absence of furfurol were carried out. Cholesterol gave a blue-violet ring in both cases, whereas sulfuric acid formed orange and gray-brown zones with cholesterol and furfurol, respectively. Bile acids formed rose to blue zones with furfurol when layered with sulfuric acid, showing the presence of the sterol skeleton common to the hormones and vitamin D. Under the given conditions, blue-green, violet to faint olive, deep carmine-red to violet-red, red-violet and violet-yellow zones were observed with piperine, picrotoxin, santonin, veratrine and morphine, respectively.—G. WOKER and I. ANTENER. *Helv. Chim. Acta*, 21 (1938), 1345-1349; through *Chimie & Industrie*, 42 (1939), 118. (A. P.-C.)

Bile Acids, Sex Hormones, Etc.—Synthetic Investigations on the Degradation Products of. I. Synthesis of 7-Methyl-0:3:3-bicyclooctane-1-one. A synthesis of 7-methyl-0:3:3-bicyclooctane-1-one by the cyclization of ethyl 1-methyl-1-carbethoxycyclopentane-2-β-propionate has been described. The fused carbon ring, thus formed, is found to be mainly *trans*.—D. K. BANERJEE. *J. Indian Chem. Soc.*, 17 (1940), 423. (F. J. S.)

Blood Picture—Interpretation of. III. Blood Platelet. The formation and study of the normal functions of the blood platelets are described. The relation of the blood platelets to the hemorrhagic diseases is discussed.—F. W. KONZELMANN. *Merck Report*, 48 (1939), No. 3, 28-30. (S. W. G.)

Blood Preservation—Studies in. Some Effects of Carbon Dioxide. It has been shown that the taking of blood directly into an atmosphere of carbon dioxide is effective in retarding changes in the concentrations of plasma ammonia, sodium and potassium which occur during storage. Such procedure might lengthen the period during which preserved blood could be used for tranfusions.—MARGARET E. SMITH, ELIZABETH TUTHILL, CHARLES R. DREW and JOHN SCUDDER. *J. Biol. Chem.*, 133 (1940), 499. (F. J. S.)

Carotene in Green Vegetables—Estimation of, by the Hilger-Sector Photometer. The carotene content of halancha (*Enhydra fluctuans*), radish leaves (*Raphanas sativus*), lal data (*Amaranthus gangeticus*), lal sāk (*Amaranthus bhitum*), red puin (*Basella rubra*), kalmi sāk (*Ipomoea reptans*), pumpkin leaves (*Cucurbita Pepo*), betel leaves (*Piper betel*), lettuce (*Lactuca sativa*), palang sák (*Beta vulgaris*), cabbage (*Brassica oleracea*), carrot (*Daucus carota*), coriander (*Coriandrum sativum*) and dheki sāk (*Diplazium esculentum*) has been determined by the sector photometric method. Pure β-carotene was taken as the standard. The extraction was carried out according to a method somewhat similar to the procedure followed by Smith, by Schertz and by Wilson, Das-Gupta and Ahmad.—BHUPAL CHANDRA RAI-SIRCAR. *J. Indian Chem. Soc.*, 17 (1940), 412. (F. J. S.)

Clinical Laboratory for the Pharmacist. Blood Chemistry. This continues a series of articles giving the required apparatus and procedures for different clinical tests. The procedures for the determination of non-protein nitrogen, creatinine, chlorides, uric acid, blood sugar and urea in blood are given and explained.—I. KRAUS. *Merck Report*, 48 (1939), No. 4, 4-6. (S. W. G.)

α-Dihydrotheelin—Isolation of, from Human Placenta. Bioassay results on an extract of 422 Kg. of human placenta show that the approximate quantities of estrogenic materials are theelol 0.14, theelin 0.035 and dihydrotheelin 0.038 mg. per Kg. of tissue. A phenol which proved to be α-dihydrotheelin was isolated from the non-ketonic fraction of human placenta.—MAX N. HUFFMAN, SIDNEY A. THAYER and EDWARD A. DOISY. *J. Biol. Chem.*, 133 (1940), 567. (F. J. S.)

Dilantin (Sodium Salt of 5,5-Diphenylhydantoin)—Method for the Quantitative Determination of, in Biological Material. Because of the desirability of obtaining information on the rate of excretion and disappearance of dilantin from the body, a method for its quantitative determination was devised. Tissues are macerated and extracted three times with 40% acetic acid. Na_2WO_4 is used as the protein precipitant. The pooled filtrates are neutralized with concentrated NaOH to p_H 6.5 and extracted with ether in a continuous extractor. Urine is acidified and extracted directly. The extracted dilantin is chlorinated with hypochlorous acid and washed with three 50 cc. portions of ice-cold water. The washed product is dissolved in a minimum amount of glacial acetic acid and an excess of KI is added. The solution is then diluted with water and the liberated iodine is titrated with 0.01*N* $Na_2S_2O_3$. One cubic centimeter of a 0.01*N* solution of $Na_2S_2O_3$ is equivalent to 0.637 mg. of 5,5-diphenylhydantoin. Recoveries of at least 95% are obtainable. Barbiturates interfere with the determination.—C. H. HINE and F. L. KOZELKA. *J. Pharmacol.*, 69 (1940), 290. (H. B. H.)

Electrolytes of the Serum in Norman Indians—Note on Some of the. The concentrations of sodium, potassium, magnesium and calcium in mg. per 100 cc. of blood serum were 289.0–378.0, 15.0–26.0, 2.3–4.5, 7.4–12.6, respectively.—HEMENDRA NATH CHATTERJEE and S. SEN. *J. Indian Chem. Soc.*, 17 (1940), 357. (F. J. S.)

Fish Livers—Preserving. Fish liver such as those for extraction of their vitaminiferous oils are cooked and mixed with from 1% to 8% of undissolved boric acid or borax.—FERDINAND W. NITARDY, assignor to E. R. SQUIBB & SONS. U. S. pat. 2,171,594, Sept. 5, 1939. (A. P.-C.)

Glucose, Glycine and Alanine—Relative Antiketogenic Activity of. Glucose and equivalent amounts of glycine, *dl*-alanine and *l*(+)-alanine exert the same antiketogenic action in fasting rats when measured by the effect on the level of acetone bodies in the blood and the amount of these substances excreted in the urine.—ARNE N. WICK, EATON M. MACKAY, HERBERT O. CARNE and HARRY M. MAYFIELD. *J. Biol. Chem.*, 136 (1940), 237. (F. J. S.)

Glycerin—Use of, in Food Products. A discussion of the value of glycerin as a hygroscopic agent, its sweetening power and use in food products.—C. W. LENTH. *Am. Perfumer*, 41 (1940), No. 2, 47-49. (G. W. F.)

Gonadotropic Hormone of Urine of Pregnancy. III. Evidence of Purity Obtained by Studies of Electrophoresis and Sedimentation. Electrophoretic studies of a pregnancy urine gonadotropin preparation containing 4000 minimal effective (ovulating) doses per mg. show that it is a protein very nearly electrochemically homogeneous, with a mobility of 4.8×10^{-5} sq. cm. $sec.^{-1}$ $volt^{-1}$ at p_H 7. The characteristic biological activity of the hormone is associated with this mobile protein and analytical data indicate that it is a glycoprotein. In the ultracentrifuge, the same preparation as well as a second one of equally high biological activity but purified by a different method sedimented as a single component.

They appear therefore to be homogeneous with respect to molecular weight. The calculated sedimentation constant (approximately 5 x 10^{-13} cm. sec.$^{-1}$ dyne^{-1}) suggests that the minimal molecular weight lies between 60,000 and 80,000. The isoelectric point was found to be p_H 3.2 to 3.3. The evidence reported indicates that hormone preparations assaying 4000 minimal effective doses per mg. are practically homogeneous glycoproteins.—SAMUEL GURIN, CARL BACHMAN and D. WRIGHT WILSON. *J. Biol. Chem.*, 133 (1940), 477. (F. J. S.)

Insulin—Crystallizing. An aqueous solution of insulin is prepared containing a phosphate buffer, an organic solvent, such as isopropyl alcohol, and zinc chloride or other soluble salt of zinc, cobalt, nickel or cadmium, and containing about 20 to 100 units of insulin per cc. of the solution. The p_H is adjusted to about 6.8. The solution is heated to about 60° C. and the precipitate is separated from the mother liquor. The acidity is gradually increased to about p_H 6.0 and the temperature gradually lowered to about 4° C., and the insulin crystals formed are separated. The acidity of the mother liquor is increased to p_H about 5.2, the precipitate thus formed is removed and dissolved in dilute sulfuric acid, the acidity of this last solution is adjusted to about p_H 3.5 and the resulting precipitate is removed.—MELVILLE SAHYUN, assignor to FREDERICK STEARNS & CO. U. S. pat. 2,174,862, Oct. 3, 1939. (A. P.-C.)

Insulin—Effect of, on Muscle Respiration. The general conclusion that insulin is a factor in the respiration of muscle is supported. Other necessary factors are the di(tri)-carboxylic acids, cocarboxylase and substances in muscle juice. Insulin added to normal pigeon breast muscle *in vitro* increased respiration about 20% both in the presence and absence of other supplements; the sensitivity to insulin was increased to 60% by removal of the pancreas. The optimum response was obtained 1 to $2^1/_2$ weeks after pancreatectomy. Insulin prolonged respiration, the effect being most pronounced after two hours. In muscle from depancreatized birds, insulin also increased respiration. The R. Q. was maintained at normal levels for four hours by insulin alone or insulin plus other supplements. Insulin preparations inactivated by heat or alkali failed to stimulate muscle respiration. Insulin action was inhibited *in vitro* by malonate, and insulin and malonate appeared to counteract each other to a certain extent in lowering blood sugar in the rabbit.—F. J. STARE and C. A. BAUMANN. *J. Biol. Chem.*, 133 (1940), 453. (F. J. S.)

Iodine Apparatus—Improved. A new torch, for use in the modified Karns' method for determining iodine in biological materials, is described.—F. X. GASSNER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 120. (E. G. V.)

Iodine in Blood—Improvements in Determination of. The catalytic action of iodine on ceric sulfate reduction has been adapted to the quantitative microdetermination of iodine in biological material. Satisfactory results may be obtained with quantities as small as 0.05 microgram of iodine. An improved distillation apparatus for rapid recovery of minute amounts of iodine is described. The value of addition reagents, such as hydrogen peroxide, in phosphorous acid for complete recovery of iodine by distillation is discussed.—A. L. CHANEY. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 179–181. (E. G. V.)

Iron and Manganese Requirements of the Human Adult. The average daily excretion of iron in those cases in which the experimental subjects (two adult men) were nearly in iron equilibrium was 10.2 mg. and 8.6 mg., respectively. Urinary iron excretions varied between 1.5 and 0.783 mg. per day. Addition of calcium in the form of milk had no effect on iron retentions. The amount of so-called available iron in the food as measured by the dipyridyl method bore no relation to the amount absorbed. Manganese was almost entirely eliminated along with the feces. The average requirement for balance was 3.7, 3.8 and 5.5 mg., respectively, in the case of three adult men.—K. P. BASU and M. C. MALAKAR. *J. Indian Chem. Soc.*, 17 (1940), 317. (F. J. S.)

Iron—Available, in Fish Tissue. Using the α-α'-dipyridyl method of Hill (*Proc. Roy. Soc.* (London), B, 107, p. 205), the author has determined the ionizable iron content of fish with the following results. Some of the iron in fish tissue is in a protein complex but on hydrolysis by pepsin and trypsin is nutritionally available and detectable by the method of Hill. Treatment of the tissue with 10% acetic acid also liberated the iron so it could be estimated by the same method. Peptic digestion of fish was complete after three hours and gave higher values than did tryptic digestion. The available iron content of the fish is concentrated in the roe during egg formation.—K. C. SAHA and B. C. GUHA. *Indian J. Med. Research*, 27 (1940), 877–886. (W. T. S.)

Lecithin Content of the Blood of Indian Women in Normal Condition and in Pregnancy—Note on the. The lecithin content of the whole blood has been determined by the method of Whitehorn (*J. Biol. Chem.*, 62 (1924), 133). The blood was examined in 25 normal non-pregnant women and 25 women in the different terms of pregnancy. A table is given which shows that there is a distinct rise in the lecithin content during pregnancy. The amount of lecithin in mg. per 100 cc. of blood was as follows: in normal pregnancy, 10.0 to 17.0; in normal women, 6.8 to 11.1. The blood was drawn between 10 and 12 A.M. and on an empty stomach.—HEMENDRA NATH CHATTERJEE and SURATH MOHAN GHOSH. *J. Indian Chem. Soc.*, 17 (1940), 356. (F. J. S.)

Methyl Glyoxal in Urine—Different Reactions of. The author tried Dènigés', Barrenscheen's and pyrrole reactions—the three reactions for methyl glyoxal in the urine. Lactating mothers with milk positive and negative to Arakawa's reaction were tested. From the richer content in methyl glyoxal-like substance in the urine of mothers belonging to the Arakawa-negative group, it may be presumed that this group is more in a *B*-avitaminotic state than the Arakawa-positive group.—R. ORIMO. *Tôhoku J. Exptl. Med.*, 35 (1939), 497. (A. C. DeD.)

Peptones—Estimation of. The authors consider that the action of peptone in asthma is due to that fraction which is either identical with or very similar to leucotaxine. They have adopted Menkin's qualitative test for this substance in the estimation of peptone, and they have placed the test on a roughly quantitative basis. The technique involves the injection of 0.2 cc. of peptone solution intradermally into the flank of a white rabbit followed by an intravenous injection of 10 cc. of a 1% solution of trypan blue. Permeability is indicated by the spread of the dye round the site of the injection. Readings are taken after forty minutes. Different peptones vary widely as indicated by the test, and there may be slight variation between different batches of the same brand of peptone.—G. E. SHAW and H. G. HIND. *Pharm. J.*, 144 (1940), 366. (W. B. B.)

Pituitary "Antagonist"—Chemical Studies on the. In disagreement with the findings of others, it was found that follicle stimulation can be promoted by intraperitoneal injections of pituitary gonadotropic extracts; the "antagonist" effect can be produced by subcutaneous injection. Either effect is produced by regulation of the rate of resorption. No difference in response to a wide range of chemical reac-

tions was found between the "antagonist" and the gonadotropic factor. The reactions included acetylation, methylation, reaction with β-naphthoquinone sulfonate, with iodine, with diazobenzene sulfonate or with cysteine and heat treatment. The existence of the luteinizing and "antagonist" fractions as separate and distinct hormones is not borne out by these observations.—FRITZ BISCHOFF. *J. Biol. Chem.*, 133 (1940), 621. (F. J. S.)

Plasma Creatinine Determination—Diagnostic Significance of. With the help of the following new method of determining creatinine, it was found that only in kidney injuries is there an increase in the plasma of the normally, unusually constant creatinine value. To 12 cc. saturated picric acid solution, add 4 cc. plasma or serum, and warm for 15 seconds in a boiling water bath. Filter through a quantitative filter. To 10 cc. of clear, cooled filtrate, add 0.5 cc. of 10% NaOH. After 20 minutes, make readings either in a step-photometer or an absolute colorimeter (Leitz). The creatinine content of the plasma is a more sensitive measure of kidney insufficiency and rises higher in uremias than the residual nitrogen. Creatinine determination enables one to draw more accurate diagnostic and prognostic conclusions and to separate the nephritics from the pseudo nephritics.—HANS POPPER, EMIL MANDEL and HELENE MAYER. *Z. klin. Med.*, 133 (1938), 56–77. (L. K.)

Porphyrindin—Determination of Reducing Groups with, with Special Reference to Egg Albumin. The authors summerize their work as follows: (1) Porphyrindin solutions are relatively unstable above 0°. (2) The oxidation of cysteine by porphyrindin does not go beyond the —S—S— stage at 0° and p_H 7.2. (3) Tyrosine is oxidized by porphyrindin at 0° and p_H 7.2 with the formation of a pink oxidation product. (4) Native egg albumin is stable toward porphyrindin. In heat-denatured egg albumin, —SH groups are oxidized by porphyrindin. In egg albumin dispersed by guanidine hydrochloride, —SH groups as well as phenolic groups are oxidized by porphyrindin.—ERWIN BRAND and BEATRICE KASSELL. *J. Biol. Chem.*, 133 (1940), 437. (F. J. S.)

Porphyrines—Fluorometric Determination of Urinary. Mix 50 cc. of urine with 2–3 cc. of acetic acid and extract in a separatory funnel with two 80–100 cc. portions of ether. Wash the united ether extracts with 10 cc. portions of water until the aqueous shakings are neutral to litmus. Add to the ether 5 cc. of 5% hydrochloric acid, mix well, then transfer the aqueous solution to another separatory funnel. Add another 5 cc. of the acid solution to the ether layer, mix well and let stand for 24 hours in a refrigerator. Combine the acid extracts, neutralize with sodium acetate and extract with two 50 cc. portions of ether. Wash the ether solution with water and extract with two 2.5 cc. portions of 5% hydrochloric acid. The acid solution exhibits a fluorescence varying from rose to orange-red under ultraviolet light. The absorption and fluorescence spectra may be observed, and the melting point of the methyl ester of the extracted porphyrine may be determined. The quantitative determination is based upon comparing the fluorescence of the sample with that of a series of known solutions under monochromatic ultraviolet light.—HARLAY and MALANGEAU. *J. pharm. chim.*, 30 (1939), 105–111. (S. W. G.)

Potassium in Biological Materials—Microcolorimetric Method for the Determination of. A microcolorimetric method for potassium determinations in biological materials is described. The material is ashed in specially made nickel centrifuge ashing tubes in the presence of HgO at a temperature of 465°. The potassium in the soluble ash is determined by an application of Shohl and Bennett's colorimetric chloroplatinate method. Details are given for whole blood, serum, urine and feces.—PETER WALDEMAR SALIT. *J. Biol. Chem.*, 136 (1940), 191. (F. J. S.)

Pregnancy Urine—Homogeneity of Gonadotropic Hormone Preparations Isolated from. Samples of gonadotropic fractions containing 4000 minimal ovulating doses per milligram when assayed in the postpartum rabbit are shown to be homogeneous to the ultracentrifuge and the electrophoresis apparatus of Tiselius. An isoelectric point of p_H 3.2–3.3 was determined.—S. GURIN, C. BACHMAN and D. W. WILSON. *J. Am. Chem. Soc.*, 61 (1939), 2251. (E. B. S.)

Pregnanediol and Other Steroids—Assays of Urine from Rhesus Monkeys for. The steroidal content of the urine of the pregnant Rhesus monkey was investigated and it was found that it does not contain even a trace of the pregnanediols common to other pregnancy urines. A pregnant monkey was injected with over 1 Gm. of estrone in 20 days and upon examination the urine was found to contain only a small portion of the total estrone injected. The estrone caused the death of the fetus. Injection of progesterone (over 1 Gm. in 20 days) into the pregnant monkey failed to produce even a trace of the pregnanediols in its urine. The progesterone had no unfavorable effect on either the mother or fetus.—R. E. MARKER and CARL G. HARTMAN. *J. Biol. Chem.*, 133 (1940), 529. (F. J. S.)

Pyruvic Acid in the Blood—Stabilization and Determination of. The authors summarize their work as follows: (1) Monoiodoacetic acid prevents the disappearance of pyruvic acid from non-precipitated blood. (2) A method is described for determining pyruvic acid in the blood. (3) Figures for the pyruvic acid content of the blood, obtained on 60 normal subjects, varied from 0.77 to 1.16 mg. %. (4) Incidental data related to the effect of fluoride and sodium cyanide are reported. (5) The stability of pyruvic acid in the spinal fluid is reported.—ERNEST BUEDING and HERMAN WORTIS. *J. Biol. Chem.*, 133 (1940), 585. (F. J. S.)

Riboflavin Content of Yeasts. A photochemical method for the determination of riboflavin in yeast and yeast products is presented. The photochemical and biological evaluations of riboflavin in yeast products were in general agreement. Wide variations were found in the riboflavin content of different samples of yeast.—A. E. SCHUMACHER and G. F. HEUSER. *Ind. Eng. Chem., Anal. Ed.*, 12 (1940), 203–204. (E. G. V.)

Riboflavin in Liver Extract. The following method of determination is recommended. Using a 1-cc. pipette graduated in 0.01 cc., transfer 1 cc. of the extract to be tested to a 50-cc. separatory funnel. In the case of extracts containing a large amount of riboflavin it is desirable to dilute the extract suitably with water and take 1 cc. of the diluted mixture. Add 1 cc. of *N* hydrochloric acid, mix, add 10 cc. of acetone slowly with a continuous mixing. Add 10 cc. of chloroform, shake and allow to separate. Run off the lower layer into a 100-cc. separatory funnel. Continue the acetone-chloroform treatment of the upper layer in exactly the same manner until the lower layer ceases to give a blue fluorescence when examined in "black light." Reserve the extracted upper layer. Extract the combined chloroform-containing lower layers with successive quantities of 5 cc. of water until no more fluorescing material can be removed. Discard the extracted lower layer and combine the aqueous extracts, extracting with successive quantities of chloroform in order to remove any blue fluorescing material. Transfer the aqueous extract, freed from blue fluorescing material, to a suitable round-bottomed flask, add the reserved up-

per layer and remove acetone by heating in a vacuum to a temperature of 35° to 40°. Add *N* sodium hydroxide till just pink to phenolphthalein, which is used as an internal indicator, and make up to a volume of 30 cc. Transfer to a shallow evaporating dish, adding an equal volume of *N* sodium hydroxide. Expose to unfiltered ultraviolet radiation for a suitable time. (An S 500 Hanovia analytical lamp for ten minutes at a distance of 18 in. was found to be satisfactory.) Transfer the irradiated solution to a 200-cc. separatory funnel, add a 20% solution of citric acid until the mixture is faintly acid to phenolphthalein, and extract with 10 cc. portions of chloroform until no more green fluorescing material is removed. Bulk the chloroform extracts to a suitable volume and compare the fluorescence of 10 cc. of this in a text-tube with prepared luminflavin standard tubes. Prepare a series of 10 standard dilutions of riboflavin in water containing 1 mg. per 100 cc. in steps of 0.1 mg. per 100 cc. Take 1 cc. of each of the standard riboflavin solutions, add 4 cc. of water and 5 cc. of *N* sodium hydroxide and expose for ten minutes to unfiltered ultraviolet radiation. Make just acid to phenolphthalein and extract with chloroform. Make up the chloroform extracts to 20 cc. Take 10 cc. of this and seal up in thin-walled test-tubes of non-fluorescent glass, using tubes identical with those to be used for the comparison of the test samples. The author has shown that riboflavin is not stable in the presence of nitric acid. The form in which riboflavin exists in commercial extracts has been discussed.—G. E. SHAW. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 541–549. (S. W. G.)

Serum Proteins—Simple Method of Preparing Dried, for Therapeutic Use. Cool a mixture of 7 volumes of 95% alcohol and 3 volumes of redistilled absolute ether to −20° or −18°. Add 1 volume of serum, cooled to 4°, drop by drop under vigorous stirring. Filter after 2 hours' standing and wash repeatedly with ether at −20°. Dry over sulfuric acid. The fine powder is slowly soluble in water to a solution resembling the original serum. Samples have been injected into dogs and one human subject without serious reactions.—W. KNOWLTON HALL, DAVID E. FADER and GEORGE M. DECHERD. *Proc. Soc. Exptl. Biol. Med.*, 44 (1940), 390. (A. E. M.)

Sex Hormones. The history of hormone therapy, physiology of hormones, hormones obtained by extraction and synthetic hormones are also discussed. —ANON. *Chemist and Druggist*, 132 (1940), 477. (A. C. DeD.)

Sitosterol Complex—Studies in the. The Isolation of α_3-Sitosterol. A new doubly unsaturated sterol, α_3-sitosterol, has been isolated from the most soluble fraction of the sitosterol complex obtained from wheat germ oil. The acetate, benzoate and *m*-dinitrobenzoate of the new sterol have been prepared and characterized. An absorption spectrum study indicates that the two double bonds in the new sterol are not conjugated. The new sterol is precipitated by digitonin. α_3-Sitosterol is probably an isomer of stigmasterol and α_1-sitosterol.—S. BERNSTEIN and E. S. WALLIS. *J. Am. Chem. Soc.*, 61 (1939), 1903. (E. B. S.)

Steroids and Sexual Hormones. XLVII. XLVIII. Oxalic ether condenses with cholestenone in presence of sodium ethylate giving an uncrystallizable ester which on saponification yields crystalline oxalylcholestenone. With ferric chloride in alcohol or ether this compound gives a deep red coloration, and can therefore be considered as an enolic compound. On heating *in vacuo* at 250° C., cholestenone is regenerated. 17-Hydroxyprogesterone was prepared, on the one hand, by partial saponification of 3,17-diacetoxypregnanone followed by oxidation of the reaction mixture and saponification, and, on the other hand, by hydration of 17-ethinyltestosterone and saponification of the 17-acetoxyprogesterone; both products proved to be identical in every respect. 17-Hydroxyprogesterone melts at 288° C.—L. RUZICKA and P. A. PLATTNER. *Helv. Chim. Acta*, 21 (1938), 1717–1725. L. RUZICKA and H. F. MELDAHL. *Ibid.*, 1760–1770; through *Chimie & Industrie*, 42 (1939), 119. (A. P.-C.)

Sterols. LXVIII. Highly Branched Aliphatic Esters of Estrone and α-Estrodiol. The trimethylacetates and the *t*-butylacetates of estrone and α-estrodiol were prepared by the reaction of these compounds with the corresponding acid chlorides in pyridine. Catalytic hydrogenation of the estrone derivatives in neutral medium yielded the mono esters of α-estrodiol. Estrone *t*-butylacetate was also prepared by the Schotten-Baumann procedure. —R. E. MARKER and E. ROHRMANN. *J. Am. Chem. Soc.*, 61 (1939), 1922. (E. B. S.)

Sterols. LXIX. Oxidation Products of Sarsasapogenin. Sarsasapogenoic Acid and Related Substances. The structure of sarsasapogenoic acid and its transformation products is discussed in terms of the ketone spiro acetal structure for the sapogenin side chain.—R. E. MARKER and E. ROHRMANN. *J. Am. Chem. Soc.*, 61 (1939), 2072. (E. B. S.)

Sterols. LXVII. Sarsasapogenin Derivatives. Bromo Compounds. A further discussion of the bromo compounds of sarsasapogenin and their reactions is presented with experimental data.—R. E. MARKER and E. ROHRMANN. *J. Am. Chem. Soc.*, 61 (1939), 1921. (E. B. S.)

Sulfanilamide and Similar Compounds—Photocolorimetric Determination of, Free or Combined by Marshall's Reaction in Filtered Light. The procedure developed by Marshall and Lichtfield (*Science*, 88 (1938), 85) is used to obtain the colored reaction product. The intensity is read in an electrophotocolorimeter designed by K. Evelyn (*J. Biol. Chem.*, 115 (1936), 63) and by means of a standard curve the quantity of sulfanilamide is determined. The standard curve must be prepared for the filter used in each case. The optical densities *L* (log 1°/1) of the colored solutions interposed on the luminous pencil having a luminous intensity of 1° (1 being the transmitted intensity) for a constant thickness are measured. Using the formula $C = L/K$, where *C* is the known concentration of the active substance (sulfanilamide) in each comparison tube and *L* the values read above, *K* is calculated. The value of *K* was found to be constant for quantities of sulfanilamide varying from 1 to 20 mg. per liter. A curve is plotted with the densities *L* as abscissæ and the concentrations *C* as ordinates, which represents the variation of *C* as a function of *L*, and is in this case a straight line. The method may also be applied to other types of photometers, such as the Pulfrich model, and photoelectric cells. —L. SERVANTIE and G. DEMANGE. *J. pharm. chim.*, 30 (1939), 162–170. (S. W. G.)

Thyroid Activity—Biological Assay of. A review with twenty-nine references.—FRANK E. HAMILTON. *Ohio State Med. J.*, 36 (1940), 286; through *Chem. Abstr.*, 34 (1940), 2534. (F. J. S.)

α-Tocopherol—Constitution and Determination of, and of Some Similar Compounds. Tocopherols are suitably determined by potentiometric titration by gold chloride. In the case of natural products, the reducing constituents of the cells (glutathione, ascorbic acid, dihydrocodeshydrases, etc.) do not interfere because, contrary to the tocopherols, they are soluble in water and insoluble in ether and petroleum ether, and are therefore easily separated from the tocopherols.—P. KARRER, R. ESCHER, H. FRITZSCHE, J. KELLER, B. H. RINGIER and H.

SALOMON. *Helv. Chim. Acta*, 21 (1938), 939–953; through *Chimie & Industrie*, 42 (1939), 118. (A. P.-C.)

α-Tocopherol—Stabilization of Racemic. The tocopherols are unstable to oxidation but in natural products their stability is due to protective substances and their vitamin E activity is not destroyed by acetylation and benzoylation. Esters of the lower aliphatic carboxylic acids are yellow, viscous oils which are neither oxidized nor darkened by alcoholic ferric chloride. By shaking in a Warburg apparatus at 38° C. it has been shown that although racemic α-tocopherol readily adsorbs molecular oxygen, the acetic and butyric esters are unaffected. Adsorption of the racemic tocopherol and the esters on alumina and starch increased the sensitivity of the racemic tocopherol to oxygen. Biological tests, Warburg measurements and extraction with petroleum ether showed that a mixture of 3 parts tocopherol, 15 parts of silica, 62 parts of starch at 38° C. for 200 hours contained 23, 100, 50 and 96% of the initial tocopherol when the adsorbate was tocopherol, tocopherol acetate, tocopherol + 1% hydroquinone, tocopherol + 1% ascorbic acid, respectively. Tocopherol acetate is at least as effective as tocopherol in biological action.—O. ISLER. *Helv. Chim. Acta*, 21 (1938), 1756–1759; through *Chimie & Industrie*, 42 (1939), 119. (A. P.-C.)

Tocopherols—Determination of, in Various Raw Materials. It has been shown that both α- and β-tocopherol can be sharply titrated potentiometrically in 80% alcohol in the presence of gold chloride, 2 molecules of gold chloride being needed for 3 molecules of tocopherol. Since carotene and other carotenoids reduce gold salt solutions their presence must be taken into account. Since the tocopherol esters do not reduce gold chloride, it was possible to show, by estimations of unsaponified wheat germ oil and comparative tests of the unsaponifiable residue, that the tocopherol content of wheat germ oil is unesterified. The following tocopherol contents were obtained by this method: linseed oil 0.023%, sesame oil 0.0050%, olive oil 0.0082%, refined coconut oil 0.0027%, wheat germ oil 0.58%, dried lettuce 0.055%. Biological tests with rats on wheat germ oil, wheat germ and α-tocopherol are in sufficient agreement with the above findings.—P. KARRER and H. KELLER. *Helv. Chim. Acta*, 21 (1938), 1161–1169; through *Chimie & Industrie*, 42 (1939), 118. (A. P.-C.)

Trace Elements in Biological Material—Distribution of. In continuation of previous work, representative types of cereals, pulses and leafy vegetables have been analyzed and the results reported. Methods devised for the spectrographic analysis of mineral substances have been applied for the identification and estimation of trace elements, and many interesting results have been obtained. It is pointed out that the methods should be very useful to those interested in problems of animal and human nutrition.—A. L. SUNDARA RAO. *J. Indian Chem. Soc.*, 17 (1940), 351. (F. J. S.)

Typha Sterol—Chromic Acid Oxidation of. Bromination of the acetate of the sterol of typha gave a dibromide melting at 124–125°. Oxidation of this compound with chromium trioxide in glacial acetic acid gave *trans*-dehydroandrosteron and a substance which decomposed on melting at 249°. The latter substance was shown to be identical with 3-hydroxy-nor-cholenic acid. The authors conclude that since the sterol of typha gives 3-hydroxy-norcholenic acid by chromic acid oxidation, this sterol belongs to the sitosterin group.—JUNGO HATTORI and KATUTARO NAKAMURA. *J. Pharm. Soc. Japan*, 60 (1940), 339–342 (in English, 126–127). (N. L.)

Urinary Androgens—Small Apparatus for Extracting. A small extraction apparatus for hormone work is described and the advantages claimed lie in the simplicity of construction and the increased efficiency in performance and handling. The cost is much lower than that of other apparatus designed for such work and all parts are interchangeable. A figure is given of the extraction apparatus.—CHARLES R. NETERVAL. *J. Biol. Chem.*, 133 (1940), 313. (F. J. S.)

Vitamin A Alcohol—Occurrence of Free, in Fish Livers. Precautions were taken to reduce the hydrolysis of the esterified vitamin A alcohol after the death of the fish. The oil obtained was submitted to fractional distillation and the vitamin A content of the different fractions was determined. The results indicate the presence of a small amount of free vitamin A alcohol with the major portion of the vitamin present in an esterfied condition.—T. H. MEAD. *Quart. J. Pharm. Pharmacol.*, 12 (1939), 409–412. (S. W. G.)

Vitamin A and Carotenoids—Evidence for the Presence of, in the Olfactory Area of the Steer. Since the absence of vitamin A from the diet causes the drying up of the mucous membranes of the body, it was suspected that the epithelia of the olfactory area together with the mucous membranes of the nasal passages in animals having normal diets might be rich in this vitamin. Absorption spectra of the extracts of these tissues exhibited bands due to the presence of carotenoids. The work is being continued.—N. A. MILAS, W. M. POSTMAN and R. HEGGIE. *J. Am. Chem. Soc.*, 61 (1939), 1929. (E. B. S.)

Vitamin A and D Contents of Cod Liver Oil. Data for the iodine values and contents of vitamin A and D of Norwegian cod liver oils are given and discussed.—E. BECKER. *Z. Vitaminforsch.*, 9 (1939), 14–19; through *J. Soc. Chem. Ind.*, 58 (1939), 1146. (E. G. V.)

Vitamin B_1—Chemical Determination of. Kinnersley and Peters devised a procedure for the assay of vitamin B_1 or aneurin, based on the formation of a colored azo derivative. Jansen later introduced a method utilizing the fluorescence of thiochrome, obtained by oxidation of aneurin by potassium ferricyanide in alkaline medium. An effort was made to augment the specificity of these reactions by extracting the colored derivative and the thiochrome with solvents; however, in the natural products the aneurin is often present in the form of a pyrophosphoric ester, the cocarboxylase: under these conditions the colored and fluorescent derivatives do not pass into the solvent and a preliminary hydrolysis (diastasic) must be carried out. The authors have developed a method based on the simultaneous application of the two methods which were heretofore used singly.—P. MEUNIER and C. BLANCPAIN. *Bull. soc. chim. biol.*, (May, 1939); through *J. pharm. Belg.*, 21 (1939), 919. (S. W. G.)

Vitamin B_6 and Vitamin K—Isolation, Determination and Synthesis of. Brief reviews are given. —C. R. ADDINALL. *Merck Report*, 48 (1939), No. 3, 8; (1939), No. 4, 16. (S. W. G.)

Vitamin C—Biochemical Determination of. The authors propose a new method for the determination of vitamin C which unites the specificity of the biological method and the rapidity and precision of the chemical method. Instead of noting the effects of the sample on scorbutic symptoms, the amount of ascorbic acid contained in the organs of six guinea pigs, to which a known quantity of the substance has been administered over an 18-day period, is determined. The determination is made chemically using the dichlorophenolindophenol method. It is possible to calculate the strength in

vitamin C of the sample according to the following formula (the most significant results are given by the suprarenal gland): $y = 68.44 \log (x + I) - 4.90$, where y is the amount of ascorbic acid in the suprarenal in mg. per 100 Gm. of fresh tissue and x is the daily dose of ascorbic acid in mg.—RANDOIN and C. P. LEBLOND. *Bull. soc. chim. biol.* (April, 1939); through *J. pharm. Belg.*, 21 (1939), 713. (S. W. G.)

Vitamin C Content—Intracutaneous Test with Indophenol as Proof of. A description of the procedure of the test and an interpretation of the results.—H. BECK and F. H. KRIEGER. *Deut. Med. Wochschr.*, 65 (1939), 1336–1340. (L. K.)

Vitamin C Contents of Fruits and Vegetables. The vitamin C content of a large number of fruits and vegetables, all determined by the same method, are recorded. Garden fresh specimens of fruits and vegetables contain considerably larger quantities of ascorbic acid than those obtained from the open market. The results here found, like some previous work reviewed in the introduction, indicate that natural variations are considerable, and contribute data which, with those of other investigators, may ultimately permit quantitative expressions of variability, and causes of variation. From the results set forth it is apparent that a very considerable part of the loss of Vitamin C content that occurs on cooking is due to discarding the cooking water.—R. C. BURRELL and V. R. EBRIGHT. *J. Chem. Educ.*, 17 (1940), 180–182. (E. G. V.)

Vitamin C—Influence of Cooking on. Although most fresh vegetables possess antiscorbutic properties, vitamin C is subject to destruction by cooking, oxidation, etc. Since methods of cooking vegetables vary widely the resulting loss in vitamin C may not be constant. "Sautéing" is a Chinese method of cooking employing boiling peanut oil for quick frying. The influence of "sautéing" on the vitamin C content of numerous vegetables native to both China and the West has been determined. The method of approach consisted of using the indophenol reaction and comparing the vitamin C content of a sample of the raw and the "sautéed" vegetable. "Sautéing" was found as destructive to vitamin C as the western way of cooking, with the duration of the cooking period a definite factor. Vegetables cooked on a large scale, as in an institution, are very liable to be overcooked and therefore the calculation of vitamin C content of the diet should be based on the cooked instead of the raw vegetables.—T. F. YÜ. *Chinese Med. J.*, 57 (1940), 523–533. (W. T. S.)

Vitamin D Content of the Liver and Body Oils of Bengal Fish. Although the vitamin A content of oils from these fish has already been determined this is the first assay for vitamin D to be undertaken. The degree of healing produced in rachitic rats and chickens by these oils served as a criterion for their vitamin D strengths. The relative effectiveness of the eight different oils tested was not identical in rats and chickens which indicates the multiple nature of vitamin D. Ruhee oil from *Labeo rohita*, known to be a good source of vitamin A, was the richest with respect to vitamin D but was only about one-third that of cod liver oil. The vitamin content of Bengal fish oils is therefore generally low.—K. P. BASU and J. C. SEN GUPTA. *Indian J. Med. Research*, 27 (1940), 865–871. (W. T. S.)

Vitamin E—Chemistry of. An extensive review of the chemistry of α-tocopherol, β-tocopherol and γ-tocopherol—the three antisterility factors which are responsible for vitamin E activity. The proof of the structures of these tocopherols, their chemical synthesis and chemical properties are discussed. Methods of chemical assay and analysis of materials containing tocopherols by potentiometric titration with gold trichloride, oxidation of the tocopherols with ferric chloride in ethanol and the colorimetric method are discussed. The author also discusses the specificity of vitamin E and related compounds and indicates the effects produced by changes in chemical constitution on physiological activity. The review is accompanied by 140 literature references.—LEE IRVIN SMITH. *Chem. Reviews*, 27 (1940), 287–329. (N. L.)

Vitamin E—Constitutional Specificity of the Effect of. The vitamin E action of the tocopherols is governed essentially by the structure of their aliphatic side chain; a modification of the latter decreases considerably their therapeutic effects; *e. g.*, 2,5,7,8 - tetramethyl - 6-hydroxychromane is practically inactive at doses of 30 mg., and the same is true of the tocopherol obtained from trimethylhydroquinone and farnesyl bromide.—P. KARRER and K. A. JENSEN. *Helv. Chim. Acta*, 21 (1938), 1622–1624; through *Chimie & Industrie*, 42 (1939), 119. (A. P.-C.)

Vitamin K Activity—Simple Compounds with. Four of a projected series of compounds have been investigated, and the results are presented.—S. ANSBACHER and E. FERNHOLZ. *J. Am. Chem. Soc.*, 61 (1939), 1924. (E. B. S.)

Vitamin K_1—Constitution of. On the basis of the degradation products of vitamin K_1 derivatives, the structure of the vitamin is presented as 2-ethyl-3-phytyl-1,4-naphthoquinone.—D. W. MACCORQUODALE, S. B. BINKLEY, S. A. THAYER and E. A. DOISY. *J. Am. Chem. Soc.*, 61 (1939), 1928. (E. B. S.)

Vitamin Researches in 1937–1938—New Results of. A review dealing primarily with the production, preparation, synthesis and properties. One hundred and six references.—DILLER. *Deut. Apoth. Ztg.*, 54 (1940), 594–599. (H. M. B.)

Vitamins and Their Occurrence in Foods. A review of the general properties, food sources and definitions of the international units of vitamins is given. Values for the vitamin content of foods and the selection of foods to meet vitamin requirements are also discussed.—HAZEL E. MUNSELL. *Milbank Memorial Fund Quarterly*, 18 (1940), 311–344. (N. L.)

Vitamins D_2 and D_3—Spectrophotometric Determination of. The authors summarize their work as follows: (1) A new reagent for the determination of vitamins D_2 and D_3, consisting of a solution of antimony trichloride and acetyl chloride in chloroform, has been described. (2) The limits of concentration of antimony trichloride and acetyl chloride, within which the sensitivity of the reagent is constant, have been determined. (3) The reagent produces a yellowish pink color with vitamins D_2 and D_3 which reaches its maximum intensity within 30 seconds and is stable for from 4 to 5 minutes. (4) The absorption curves of the reaction product of the reagent with vitamins D_2 and D_3 have been determined in a Bausch and Lomb spectrophotometer. The two curves are identical, having a maximum at 500 mμ. (5) The $E^{1\%}_{1\text{ cm.}}$ values at 500 mμ for vitamins D_2 and D_3 are identical and are approximately 1800, which is about three times the value given by the reagent proposed by Brockmann and Chen. (6) The optical density, as determined by the difference in absorption at 500 and 550 mμ, is directly proportional to the vitamin concentration. (7) The lower limit of the amount of vitamin that can be accurately determined by the method described is approximately 0.2γ.—CYRIL H. NIELD, WALTER C. RUSSELL and A. ZIMMERLI. *J. Biol. Chem.*, 136 (1940), 73. (F. J. S.)